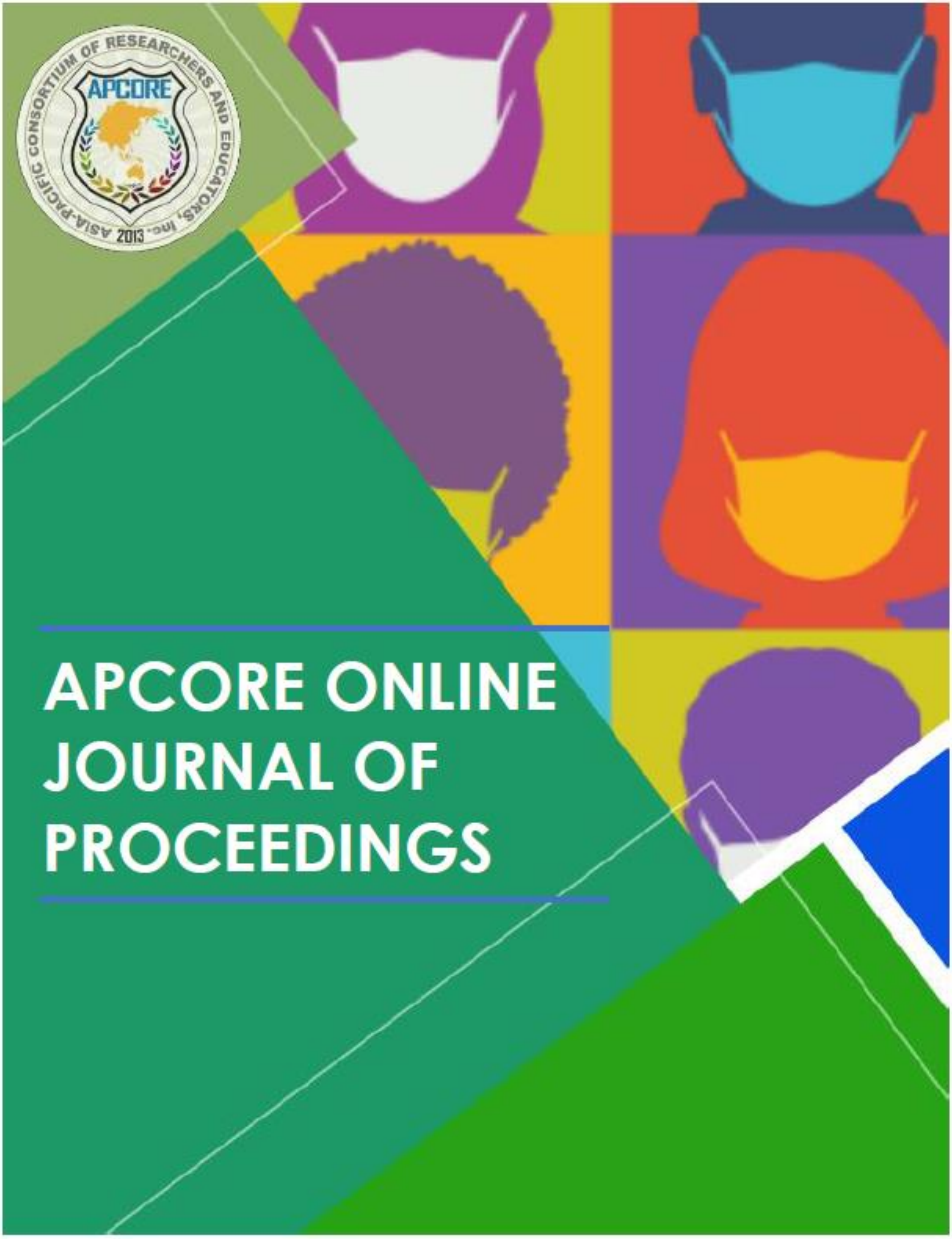

APCORE ONLINE JOURNAL OF PROCEEDINGS

2021 APCORE
Virtual Convention and
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APCORE ONLINE JOURNAL OF PROCEEDINGS

organized by the
ASIA-PACIFIC CONSORTIUM OF RESEARCHERS AND EDUCATORS – PHILIPPINES

in partnership with
Quezon City University, Universidad de Manila, Holy Trinity University, Laguna State Polytechnic University, Holy Angel University, Cavite State University Aklan State University, STMIK Bina Insani Indonesia, Research Synergy Foundation

with the support of
Southeast Asian Ministers of Education Organization / Regional Centre for Early Childhood Care, Education and Parenting (SEAMEO CECCEP), Southeast Asian Ministers of Education Organization - Technical and Vocational Education and Training, Academic International Consortium of Indonesia

2021APCORE Virtual Convention and INTERNATIONAL CONFERENCE

APCORE ONLINE JOURNAL OF PROCEEDINGS

Volume 1, Issue 1, 2021

Conference Theme:

The Role of Education and Research in Overcoming Challenges
in the Post Pandemic World

08th – 10th December 2021

zoom
Video Conferencing

E-ISSN: 2980 - 4388

Cover Design:	Randy D. Sagun
Creative Consultant:	Gary Antonio C. Lirio
Editorial Advisers:	Reylan Joseph B. Viray
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SOCIAL SCIENCES

Demystifying Meta-Categories in Philippine Suicide Notes: A Forensic Discourse Analysis

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Abstract - As suicide notes are considered severity markers of suicide acts, they often convince the survivors that the act committed, or about to commit, is justifiable. While numerous studies were conducted on suicide notes across research disciplines, most were meant for psychological and psychiatric interpretations. This research examined the distinctive features and functions of meta-categories in suicide notes written in the Philippines. As qualitative research, this study employed forensic discourse analysis as a method of analysis through Shapero's (2011) meta-categories framework. The notes were collected from the Philippine National Police and Philippine newspapers. The findings revealed that Filipino note-writers wrote their suicide notes with reasons for committing suicide, references to the happenings in the past, instructions of command or request to survivors, statements of who they are, memory or remembrances, and attempts for humour. No meta-categories were found for the note-writers' methods of suicide, specifications on the location of suicide, and details about essential responsibilities. As far as meta-categories are concerned, the study concluded that the primary meta-categorical function of a suicide note in the Philippines is to provide reasons for suicide. The study recommends embarking on larger Filipino suicide corpora for a broader scope, analysis, and interpretation, characterizing meta-categories in terms of gender, and distinguishing the similarities and differences of meta-categories in suicide notes written by suicide-completers and attempters in the Philippines.

Keywords - forensic linguistics, suicide notes, meta-categories, forensic discourse analysis, qualitative research, Philippines

Introduction

Suicide notes are written, or recorded messages left by individuals who either committed suicide or intended to commit suicide (Darbonne, 1969; Leenaars, 1988; Ho, Yip, Chiu, & Halliday, 1998; Prokofyeva, 2013). As these notes are considered markers of severity of the suicide acts, they often posit significant perceptions on how suicidal individuals think before performing suicide. They usually function to convince the reader(s) or addressee(s) that the act committed, or about to commit, is justifiable (McClelland, Reicher, & Booth, 2000; Salib, Cawley, & Healy, 2002). Further, these texts offer true motivations and reasons for the act of suicide (Ho, Yip, Chiu, & Halliday, 1998; Canetto & Lester, 2002) and could take various forms which range from notes, letters, notebooks, diaries, poems, greeting cards, transcribed audio, or videotapes, and even posts and blog entries on the internet (Shapero, 2011; Prokofyeva, 2013).

Unlike any of the established genres, suicide notes are written privately by note-writers who may never have read a suicide note before. Overtly, suicide notes are part of the non-established genres, which Swales (2007) described as occluded because of their extreme privacy and inaccessibility. They are generally hidden from public sight and function. Thus, access to sample suicide guide texts for writing is substantially difficult. However, behind this status, these notes have earned a position of questions and relevance among researchers, particularly in understanding people's thoughts with suicidal tendencies.
The increasing interest that the phenomenon of suicide gained across research disciplines has stimulated diverse research perspectives on how the language of suicide embedded in suicide notes could be examined to characterize the consistent and prevalent linguistic structures and attitudes of suicide-attempters and completers. As such, these notes as pieces of suicide evidence are reflected as good sources of data for linguistic inquiry, specifically in providing suicide insights and reasons for committing suicide acts. Thus, researchers from interdisciplinary scholarships have analyzed an array of suicide notes to provide interpretations and understanding of the thoughts of suicidal individuals (Abaalkhail, 2015).

Meta-categories are one of the defining and distinctive features of a suicide note. Shapero (2011) described it as features that occur at a relatively higher level of discourse. These features are not generally realized by stereotypical words or phrases but by larger vocabularies, several sentences, or even paragraphs. In illustrating meta-categories, Shapero (2011) provided the basic patterns for which it is analyzed. These include who, where, why, how, events, memories, humour, instructions, and trivia. Who is any occurrence of the note-writer explicitly saying who he or she is. Any occurrence where the note-writer states where he or she is during the act of suicide pertains to the meta-category where. The meta-category why refers to any text given about the note-writer's reason(s) for his or her suicide. Meanwhile, the meta-category how refers to the note-writer's method of suicide. References to happenings in the past, present, or future are events, while memories include passages of remembrance and those non-explicitly stated recollections. On the other hand, humour refers to any attempt at humour, including jokes. Imperatives, inventories, and statements containing clauses of command or request are called instructions. Finally, trivia constitutes any considerable important details concerning various responsibilities of the note-writer.

Considering suicide notes as crucial evidence used in the investigation of death, forensic discourse analysis (FDA) serves as an appropriate method of linguistic inquiry in providing an avenue in distinguishing linguistic features of a suicide. As a specialized field of discourse analysis, FDA holds a scientific study of linguistic evidence used for law enforcement and delivery of social justice (Kredens, 2016). It analyzes spoken and written discourse in legal settings, such as analyzing written evidence provided in a court of law. Also, Royce (2014) referred to the term FDA as the application of text analytic techniques to whole texts and their constituent parts, including the analysis of style, word choice, spelling, punctuation, rhetorical strategies, and the overall structure of written verbal, or electronic texts. The main focus of forensic discourse analysis is to provide linguistic evidence for legal cases. With the FDA's method to analyze and discriminate linguistic evidence used for law enforcement and legal cases, the language embedded in the occluded genre of suicide notes could be determined, including its structures, topics/themes, and textual regularities and irregularities. Further, forensic discourse analysis could examine the function a suicide note holds in a suicide act.

There have been previous studies across the globe that examined suicide notes as research focus like that of Durkheim (1951), Shneidman and Farberow (1957), Darbonne (1969), Leenaars (1988), Black (1993), and Linn and Lester (1996). However, most of the analyses came from psychological, psychiatric, and sociological viewpoints centered on testing psychological views and theories of behavior and the preset claims of behavioral categories used in suicide. Only a few studies on suicide notes have focused on the linguistic or discursive stance like that of Osgood and Walker (1959), Gottschalk and Gleser (1960), Ogilvie, Stone, and Shneidman (1966), Edelman and Renshaw (1982), and Gregory (1999). However, most of these studies were conducted more than 50 years ago, and thus, this necessitates new and updated studies on linguistic viewpoints of inquiry.

Behind the increasing interest in suicide research around the globe, research on suicide notes remains unpopular in the Philippines which, in effect, impedes the development of studies in this area. Moreover, there is still no clear body of literature and database of suicide notes in the archipelago. Even though there were pioneering studies in mainland Luzon, most of these are from the perspectives of characterizing legal texts and the plight for plain English writing. No studies have categorically explored suicide notes as a niche for linguistic inquiry. With this, the researcher found the necessity to perpetuate a forensic discourse-based study focusing on meta-categories in suicide notes written by Filipino note-writers in the Philippines. Furthermore, the researcher aimed to address the scarcity of studies on suicide notes in the present body of literature and make a theoretical insight into the field of forensic linguistics in the Philippines.

Objective of the Study

This study aimed to uncover the distinctive features of meta-categories manifested in suicide notes written by Filipino suicide-completers. Specifically, the study was guided by the research question 'What are the meta-categories found in Philippine suicide notes in terms of who, where, why, how, event, memory, humour, instruction, and trivia?'.

Framework of Meta-Categories

Shapero's (2011) Framework for Suicide Note Analysis provides and elaborates a qualitative and quantitative forensic discourse approach to analyzing suicide notes. In his framework, suicide notes are examined through their anatomical features, which specify how note-writers begin and end a suicide message. These features of suicide messages outline some categories that appear salient in writing suicide notes. These features include topic categories, meta-categories, and linguistic oddness.

The focus of this investigation is the meta-category. Shapero (2011) defined meta-category as a feature that occurs at a relatively higher level of discourse in suicide notes. Unlike topic categories and linguistic oddness which are typically realized by lexis and phrases, meta-categories are not generally demonstrated by any stereotypical set of works or phases but by a more extensive vocabulary and over several sentences or even paragraphs. Illustrated in Table 1, Shapero (2011) provided a breakdown for the analysis of meta-categories. This includes who, where, why, how, events, memories, humor, instructions, and trivia.

Table 1. Meta-Categories Framework (Shapero, 2011)

Category	Description
Who	This is any occurrence of the note-writer explicitly saying who they are.
Where	This is an occurrence of the note-writer stating where they are completing the suicide act or where the note-writer's body can be found.
Why	This refers to any text given about the note-writer's reason for his or her suicide.
How	This refers to the note-writer's method of suicide.
Event	These are references to happenings in the past, present, or future.
Memory	This includes passages of the type *"do you remember when…"* as well as those non-explicitly stated as remembrances.
Humour	This refers to any attempt for humour, including jokes.
Instruction	These are imperatives, inventories, and statements containing clauses of command or request such as *will you please…, please, will you…, look after…,* or *take care of…*
Trivia	This constitutes any considerable important details concerning various responsibilities of the note-writer.

Who is any occurrence of the note-writer explicitly saying who he or she is. It excludes signatures unless they are in the form: 'I am Jose Martinez' or 'Yours faithfully, Jose Martinez'. Any occurrence of the note-writer stating where they are during the act of suicide pertains to the meta-category where. This category need not be explicit as a lone sentence or paragraph and can be reasonably taken to mean that this is where the note-writer's body can be found (Shapero, 2011). The meta-category why refers to any text given about the note-writer's reason for his or her suicide. The meta-category how refers to the note-writer's method of suicide rather than his or her reasons for it. As a meta-category, event is a reference to happenings in the past, present, or future while memory is a passage with phrases containing 'do you remember when…' and those non-explicitly stated as remembrances. Event and memory are sometimes difficult to distinguish from each other. Hence, Shapero (2011) identified these two categories as mutually exclusive. On the other hand, humour as a meta-category refers to any attempt for humour, including jokes. Imperatives, inventories, and statements containing clauses of command or request such as 'will you please…', 'please, will you…', 'look after…', and 'take care of…' are referred as instruction. Finally, trivia constitutes any considerable important details concerning various responsibilities of the note-writer like 'Pay my library fine of Php 35.00'.

Methodology

This study is qualitative research employing forensic discourse analysis through the framework of Shapero (2011) on meta-categories. As qualitative research, the study involved interpretative and naturalistic approaches to the case of suicide notes in the Philippines. This means that the investigation of the suicide corpora was done in their natural settings, attempting to sense or interpret phenomena in terms of the meanings that writers bring to them (Denzin & Lincoln, 1994). Particularly, through the lens of forensic discourse analysis, the study uncovered and described the anatomical features of meta-categories in suicide notes written in English and Filipino languages by Filipino suicide-completers.

Data Gathering of the Corpora of Suicide Notes

The corpora of suicide notes were collected from two sources: Philippine National Police and newspapers across the Philippines that reported suicide acts and published verified suicide notes. The corpora gathered from the Philippine National Police were physical notes recovered during the investigation of verified deaths through suicide across the Philippines. Characteristically, these were tagged as evidence of suicide and were identified as genuine suicide notes written by Filipino suicide-completers. On the other hand, the suicide notes gathered from news articles comprised of suicide notes published in newspapers with national and regional circulation in the Philippines. The gathering of corpora was a collaborative endeavor with Simon (2015) who similarly compiled suicide notes published in newspapers. Comparably, these suicide letters published in newspapers were marked and validated by Philippine National Police (PNP) as genuine suicide notes left by Filipino suicide-completers.

In the raw collection of the suicide notes, the researcher observed the following selection and inclusion criteria: (a) The note should be in complete physical text and primarily illustrated as a photograph in the published news article. This measure was critically considered to ensure that the suicide notes were free from distortions, modifications, and other typological errors. This was critical since this research aimed to investigate Philippine suicide notes in their natural, original, and authentic form and setting; (b) The note must be marked and stated explicitly as a genuine suicide note in the news article as verified by the police authorities in the Philippines. This was an essential measure in the study since the investigation aims to reveal and characterize meta-categories that hovered in genuine suicide notes; (c) The person who committed the suicide and left the suicide note is a Filipino and this detail must be stated explicitly in the news article. This measure ensured that the scope of the data was written exclusively by Filipino suicide-completers before committing the act of suicide; (d) The language of the suicide note is either written in English, Filipino, Cebuano, or a combination of two or all of the said languages. This measure ensured that the meta-categories manifested in suicide notes are examined in the context of Philippine English, Filipino or Cebuano languages; and (e) The newspapers that reported a case of suicide and published the suicide notes were either nationally or regionally circulated. This measure helped the researcher narrow the verifiable sources of suicide notes. Table 2 shows the corpora of the study in two categories.

Table 2. Corpora of the Study

Corpora Category	Number of Notes
Suicide Notes Written in English	29
Suicide Notes Written in Filipino/Cebuano	30
Total	**59**

Given the selection and inclusion criteria, only 59 suicide notes met the data collection measures and served as the corpora and unit of analyses in this study. As illustrated in Table 2, 29 were written in the English language, and 30 were written in the Filipino/Cebuano language. The notes were written by Filipino male and female suicide completers aged 15 to 55 years old. The collected suicide letters were written from the year 2000 to 2016.

Data Preparation and Analysis

The preparation of suicide notes for analyses started with the establishment of a corpora coding system. The corpora coding system was followed to establish a systematic order, reference, and validation in analyzing and presenting the suicide notes. Since there were two corpora categories, the corpora coding system was divided into two clusters, namely: SNE and SNF. SNE stands for Suicide Notes written in English while SNF refers to Suicide Notes written in Filipino/Tagalog. The code No. 01 is the sequence number of the individual suicide note in the corpora compilation. The M and F (Male and Female) represent the codes for the gender of the note-writers. The digits after the code for gender (i.e., 38) illustrate the age of the note-writer during the act of suicide. An example of a coded suicide note is SNE No. 01-F-38 where No. 01 is note 1 in the corpora sequence of suicide notes written in the English language in which the note-writer is a female aged 38 years old at the time of suicide.

Using the lens of forensic discourse analysis through Shapero's framework, the researcher identified, analyzed, and described the meta-categories prevalent and consistent in the suicide notes written by Filipino suicide-completers. The examination of meta-categories in suicide notes in this study was limited only to the sub-categories who, where, why, how, events, memories, humor, instructions, and trivia. With this, the researcher followed a topical approach of analysis and review based on these nine sub-categories. Hence, the analyses involved nine stages.

The results and findings of the analyses were subjected to the rigorous process of inter-coder reliability and validity review. The inter-coders and reviewers consisted of two groups: forensic practitioners and faculty experts in forensic linguistics. The forensic practitioners have backgrounds in document analysis and criminology while the faculty reviewers have track records in conducting studies related to language and law and have undergone a short course training on forensic linguistic analysis. The inter-coders were briefed on Shapero's Framework on Meta-Categories and were asked to independently and separately code and review the researcher's raw and consolidated analyses and results. Another two faculty experts in forensic linguistics were tapped to review the interpretation of the results and findings of the study. This measure was done to assess and establish the soundness, trustworthiness, and validity of the results and interpretations yielded in the analyses. Moreover, the researcher utilized the criteria of Lincoln and Guba (1985) in the evaluation of the analyses.

Finally, the extraction of excerpts from the original corpora of suicide notes was reviewed and validated for consistency, reliability, and truthfulness purposes. This move was carefully considered in this study to avoid manipulation and ensure that the excerpts that illustrate or manifest each feature of meta-categories are accurate and the same as the suicide-completers wrote them. The same faculty experts in forensic linguistics reviewed the truthfulness and veracity of all suicide text excerpts presented and illustrated in this study.

Ethical Considerations

Since the case of suicide corpora in the Philippines is extremely a sensitive subject, the names of Filipino suicide-completers who wrote and left suicide notes were anonymized for privacy, professional, and ethical considerations. The anonymization was done by assigning dummy names on the suicide notes that reflect the actual names of the suicide-completers. The dummy names were indicated by the coding [name]. However, non-linguistic attributes such as age and gender were noted accordingly in the coding of the corpora for text value and reference. Further, the dates indicated in the suicide notes were filtered during coding and presentation since this detail may uncover and trace the anonymized names of the note-writers.

Results and Discussions

As examined based on its distinctive features and functions, meta-categories are recognized through a larger vocabulary and over several sentences or paragraphs. They occurred at a relatively higher level of discourse in the suicide notes, namely: who, where, why, how, event, memory, humour, instruction, and trivia. Table 3 presents the summary of meta-categories with their corresponding corpora presence and category frequency.

Table 3. Meta-Categories in Philippine Suicide Notes

Category	Corpora Presence (n=59)	%	*f*	%	Sample Excerpts
Why	38/59	64.4	38	42.7	*I feel certain that I am going mad again; Niloko niya ako mama kaya ko nagawa ito.*
Event	18/59	30.5	28	31.5	*Pumunta ako sa inyo tapos madadatnan ko na may kasama kang iba,*
Instruction	17/59	28.8	18	20.2	*Please pray for me; Panoorin na lang ninyo ang video sa laptop.*
Who	2/59	3.4	2	2.3	*We spouses [Louie] and [Rose Lim]; my name was [julie loraine buena]*
Humour	1/59	1.7	2	2.3	*haha how messed up is that; surprise mon and dad ive known I was trans since i was 13*
Memory	1/59	1.7	1	1.1	*You remember when I returned from the hospital I broke down.*
Total			**108**	**100**	

Table 3 presents the results of the analysis for the meta-categories. It shows that why is the most manifested meta-category in Philippine suicide notes. It is found in 38 or 64.4% out of the 59 notes investigated and has 38 or 42.7% category frequency. Event comes as second having found in 18 notes or 30.5% with 28 or 31.5% category frequency. As the third most manifested, instruction is illustrated in 17 notes or 28.8% with 18 or 20.2% category frequency. Who, as fourth, is explicated in two notes or 3.4% with 2 or 2.3% category frequency while humor and memory were mentioned in one note or 1.7% with two or 2.3% and one or 1.1% category frequency, respectively. Characteristically, the meta-categories how, where, and trivia were not found in the Philippine suicide corpora during the analyses.

Meta-Category Why

As a meta-category, why refers to any reasons that a note-writer indicates for his or her suicide. It can be in the form of small or large texts in a note that attempt to explain reasons for suicide explicitly or implicitly. Reasons for suicide that are explicitly stated are easy to identify because of the high emotions these statements embody while implicit reasons are quite challenging to identify. However, most of these include statements or phrases like 'I don't know why I'm doing this' (Shapero, 2011). Conversely, as to the perception of suicide, common reasons that most suicide completers wrote in their notes are relationship problems or failures, mental, psychological and physical health issues, work or business-related problems, and others (McClelland, Reicher, & Booth, 2000; Shapero, 2011; Abaalkhail, 2015). Sample excerpts with relationship problems as reasons for suicide are provided as follows:

> **SNE No. 14-F-21**
> My dearest [June]
> It seems as if I have been spending all my life apologizing to you for things that happened whether they were my fault or not......I don't want you to think I would kill myself over you because you're not worth any emotion at all. It is what you cost me that hurts and nothing can replace it.

SNF No. 11-M-27
Hindi kita mapapatawad, dadalawin kita habambuhay [Maris]! Mag-aaply ako ng trabaho para sayo, ano ginawa mo? Pumunta ako sa inyo tapos madadatnan ko na may kasama kang iba......
Niloko niya ako mama kaya ko nagawa ito. Sory kuya, ate, apo at mga pamangkin

In SNE No. 14-F-21, the concluding statement 'It is what you cost me that hurts and nothing can replace it' is a clear indication of a relationship issue, not to mention the context of the other previous statements. Also, the statement conveys the severity of the relationship problem hinted at by the words cost and hurt. Similarly, the case of SNF No. 11-M-27 shows cheating as the cause of the relationship problem. The line 'Niloko niya ako mama kaya ko nagawa ito' (She cheated on me mama which resolved me to do this) shows cheating as the explicit reason why the note-writer committed suicide.

Sample notes with suicide reasons related to mental, psychological, and physical health issues are provided as follows:

SNE No. 01-M-44
[Mary Anne],
I feel certain that I am going mad again. I feel we can't go through another of those terrible times. And I shan't recover this time. I begin to hear voices, and I can't concentrate. So I am doing what seems the best thing to do...

SNE No. 17-M-28
[Ivan], I am telling you that I committed suicide because I could no longer take the illness I got from Iloilo City which could be transmitted thru blood contact.

SNE No. 22-M-24
It's a crazy planets

SNE No. 01-M-44's line 'I feel certain that I am going mad again' is an explicit manifestation of a mental issue initiated as a reason for committing suicide. Hamilton (2012) purported that madness is one of the most common health issues used as reasons by individuals who settled for suicide. In another view, health issues linked to the physical aspect are exemplified in SNE No. 17-M-28. The note-writer in his statement 'I am telling you that I committed suicide because I could no longer take the illness I got from Iloilo City which could be transmitted thru blood contact' gives the addressee, [Ivan], the explicit information why the note-writer decided to commit suicide. Meanwhile, the statement 'It's a crazy planets' in SNE No. 22-M-24 illustrates a psychological health issue experienced by the note-writer. The phrase 'crazy planets' can be perceived as psychological forms of isolation, hopelessness, or perception of the world as cruel for the note-writer.

Sample notes with work or business-related problems as reasons for suicide are provided as follows:

SNE No. 06-M-44
To whom this may concern:
Due to financial difficulties encountered in the course of our business corporation over the years, which resulted to heavy borrowing from loans, the high interest rates had made impossible for us to survive. In view of this We spouses [Louie] and [Rose Lim], have decided to leave this world and to bring along our 3 children ([Jimmy], [Jenny] and [Jude])......

SNE No. 11-M-53
I come to the end. I don't want my family to bear this problem. Being indicted for graft is the worst thing for me. All I wanted was to have a clean, simple life...that's an example I want to leave to my children......

In SNE No. 06-M-44, the note-writer explicates their financial difficulties in business as the reason for the family's suicide. Meanwhile, the statement 'Being indicted for graft is the worst thing for me' in SNE No. 11-M-53 indicates work problems as the note-writer's reason for suicide. In the excerpt, the word 'graft' tells readers that the note-writer is associated with government service and being indicted of it ascribes dishonor, dishonesty, tainted credibility, and corruption in public service. By this interpretation, the note-writer wanted to avoid these complications as marked by the word 'worst' which obligated him to view suicide as the best way out.

The presence of why as a meta-category is given references in many previous studies dealing with suicide notes. Capstick (1960) reported that more than 50% of his note-writers were inclined to explain why they settled for suicide. Similarly, Darbonne (1969) reported a category for suicide reasons while Gregory (1999) found the inclusion of reasons in the notes he investigated and posited that 'detailed' suicide reasons are characteristics of genuine suicide notes. Moreover, McClelland, Reicher, and Booth (2000) propounded that 104 of their 172 notes reflected reasons for suicide. Correspondingly, this study adds value to suicide reasons as the most manifested linguistic category in the suicide notes investigated.

Meta-Category Event

Events are generally concerned with the note-writer's past happenings but may also refer to present and future references (Shapero, 2011). In this study, events usually recall past experiences and were closely associated with the reasons that escalated the note-writer to decide for suicide. Sample excerpts of events are as follows:

SNE No. 04-M-34
I made this biggest mistake of my life last week. I shouldn't have submitted the affidavit. I should have followed my heart. My mind was confused. I don't want to live with the thought that I turned my back on the people who trust me. By submitting that affidavit, I exposed myself to going beyond the truth.

SNE No. 09-M-28
[Anita], I'm not sure why I'm writing this. I went online to look up information on suicide: statistics, methods and all that stuff. I was raised in a family where I went to church every Sunday and was taught the importance of faith and God in our lives. It doesn't matter. It doesn't help me. I got hurt...bad...when I was a child. I was hurt in a way that no person, no little child should be hurt......

SNF No. 10-M-26
Iniwan niya ako ng walang dahilan at natuklasan ko na mayroon na pala siyang ibang minamahal. Well to all my friends and family, thank you for all the support and guidance, I'm so sorry if I fail you guys for just a girl......

SNF No. 11-M-27
Hindi kita mapapatawad, dadalawin kita habambuhay [Maris]! Mag-aaply ako ng trabaho para sayo, ano ginawa mo? Pumunta ako sa inyo tapos madadatnan ko na may kasama kang iba......

In SNE No. 04-M-34, a reference to an event is found in the line 'I made this biggest mistake of my life last week'. Here, the word 'made' and the phrase 'last week' indicate a past happening described by the note-writer as the biggest mistake of his life. Also, the concept of an event as a past happening is further highlighted in the lines 'I shouldn't have submitted the affidavit' and 'I should have followed my heart'. These lines expound the regret of the note-writer which is a circumstance of a past action related to work problems.

Similarly, the case of SNE No. 09-M-28 shows a narrative of past experiences, specifically the note-writer's mental health struggle. Here, the statement 'I got hurt…bad…when I was a child' reveals a past action associated with the note-writer's current sufferings that eventually led to suicide. Henceforth, events are interpreted as escalated justifications why a note-writer resolved for suicide.

In another case, the line 'Iniwan niya ako ng walang dahilan at natuklasan ko na mayroon na pala siyang ibang minamahal' in SNF No. 10-M-26 indicates an event that is linked to a relationship failure. In this excerpt, the note-writer revealed that his girlfriend dumped him without reason and eventually found out she was already with someone else. This is also the case of SNF No. 11-M-27 wherein the note-writer associated his event to relationship failure through the lines 'Mag-aaply ako ng trabaho para sayo, ano ginawa mo?' and 'Pumunta ako sa inyo tapos madadatnan ko na may kasama kang iba' which are interpreted as 'I am going to apply for job for you, but what did you do?' and 'I went to your place then only to find out that you were with someone else', respectively.

Events, as a meta-category, were also given attention in the study of Osgood and Walker (1959) who described it as a 'time' category. Likewise, McClelland, Reicher, and Booth (2000) found ten percent of event forms while investigating self-blame mitigations. Shapero (2011) similarly reported that over 54% of the genuine suicide he analyzed reflected events in his meta-category scheme. It is noteworthy to mention that Shapero's meta-category scheme was the framework utilized in this study.

Meta-Category Instruction

Instructions are imperatives, inventories, statements, and clauses containing requests such as 'will you please...', 'please will you...', 'look after...', and 'take care of [name]' (Shapero, 2011). For this study, reminders of care are also included as instructions. Characteristically, instructions in suicide notes are viewed as the note-writer's positive self-presentations and mitigating measures for the eventual pain being caused. Forms of this feature are usually taken as funeral arrangements, assigning responsibility or care, requests for prayers, relaying messages of appreciation, care reminders, and others. Sample excerpts of instructions are as follows:

> **SNE No. 16-F-25**
> To all my cousins relatives and friends, death is not the end but it is the beginning of a new life...I'll just go ahead of you. Please come to my burol. Please pray for my soul. [Lyn]
>
> **SNE No. 19-M-33**
> I'm sorry but this is my final option. Always remember that I am always at your side. I love you so much.
>
> **SNF No. 13-M-33**
> Gang mahal na mahal kita, alagaan mo si [Maria], kahit kailan ikaw lang ang minahal ko kaya lang hindi mo ko pinagbigyan, sawa na ako mag-isang matulog, sobrang lungkot ko.
>
> **SNF No. 15-M-21**
> Ma, ate, [Alyn], ikakabigla ninyo ito. Hindi ko na kaya. Panoorin na lang ninyo ang video sa laptop. Sorry...I love you, [Alyn]. [Tom].

The lines 'Please come to my burol (wake)' and 'Please pray for my soul' in SNE No. 16-F-25 constitute a funeral instruction and a prayer request whereas a reminder of care is conceived as instruction in SNE No. 19-M-33. Also, the line 'alagaan mo si [Maria]' (take care of [Maria]) assigns responsibility to the addressee of SNF No. 13-M-33. Lastly, SNF No. 15-M-21's'Panoorin na lang ninyo ang video sa laptop' line translated as 'Just watch the video in the laptop', shows an instruction of what to do once the suicide is discovered.

Many early studies found locations of instruction in suicide notes. First to report it is Shneidman and Farberow (1957) who posited instruction as a definite characteristic of genuine suicide notes. Capstick (1960) found 30 instruction mentions in the 136 suicide notes he examined. Also, Ogilvie, Stone, and

Shneidman (1966) reported specific instruction as typical to female note-writers while Jacobs (1967) included instructions to his six categories of suicide notes. Darbonne (1969) postulated that instructions are common to notes written by individuals aged between 50 to 59 years old at their death. Furthermore, the studies of Edelman and Renshaw (1982), Arbeit and Blatt (1973), Lester and Leenaars (1988), and O'Donnell, Farmer, and Catalan (1993) found out that instructions are common in genuine suicide notes. It was similarly confirmed by Black (1993) and Gregory (1999). Additionally, there were references of instruction in the study Etkind (1997) who labeled instructions as 'mundane'. In most recent studies, McClelland, Reicher, and Booth (2000) found 50 representations of instruction in their investigation while Salib and Maximous (2002) and Salib, Cawley, and Healy (2002) reported that 17% of their notes were much concerned in giving instructions.

Meta-Category Who

Who is simply any occurrence of the note-writer stating who he or she is. This meta-category is easy to identify because of its high explicitness in suicide notes. However, names or roles appended as signatures are not included in this meta-category since signature names are generally part of the move structure, another linguistic feature in suicides notes. Specific to who as meta-category are statements that note-writers used to introduce themselves in their notes such as My name is…, I am…, and other self-introductory statements. Sample excerpts that show who as meta-category are as follows:

> **SNE No. 06-M-44**
> To whom this may concern:
> ...the high-interest rates had made impossible for us to survive. In view of this We spouses [Louie] and [Rose Lim], have decided to leave this world and to bring along our 3 children ([Jimmy], [Jenny] and [Jude]) as we believe that they will more comfortable leaving with us than to be left behind......
>
> **SNE No. 29-F-15**
> …my name was [julie loraine buena] and my gender neutral name was lee. i was 15, assigned female at birth, and i dentified as nonbinary (surprise mon and dad ive known I was trans since i was 13)......

The excerpts presented are notes that indicate note-writer's statements of who they are. The line 'We spouses [Louie] and [Rose Lim]' in SNE No. 06-M-44 gives explicit information on the names of the suicide-completers. Further, in its distinct characteristic, SNE No. 06-M-44 presents a mutually written note by two individuals as directed by the words 'we' and 'spouses'. By this, it is interpreted that the decision to commit suicide gained consensus between the spouses as the note reflected their names. On another view, SNE No. 29-F-15's 'my name was [julie loraine buena]' line explicitly details who is the note-writer. By highlighting the word was as the past tense of is, it can be construed that the note-writer was already assuming her death when writing the note with her complete name.
The low statistics manifested by the meta-category who in this study is aligned to the findings of Shapero (2011) who similarly established it as one of the least manifested items in his meta-category scheme.

Meta-Category Humour

Shapero (2011) described humour as any attempt to evoke laughter or jokes in a suicide note. This also includes expressions such as 'hahaha', 'surprise', 'gotcha', and the like. In this study, the concept of humour, although rare in the suicide notes, is found to project the intention of the note-writer to avoid sympathy or pity and even to appear the act of suicide being committed as less serious. Below is a sample note that attempted to display humour:

> **SNE No. 29-F-15**
> okay. this post isnt about my reasoning for taking my life and all its –potential-- im letting my reasons die with me, cause im afraid of being judged for them haha how messed up is that. this is all being typed just for the sake of it......

> ...my name was [julie loraine buena] and my gender neutral name was lee. i was 15, assigned female at birth, and i dentified as nonbinary (surprise mon and dad ive known I was trans since i was 13). panromantic, demisexual, as of this moment, so yes dad i made out with a girl......

Rather than listing her reasons for suicide, the note-writer in SNE No. 29-F-15 invoked humour through the line 'haha how messed up is that' which can be viewed as her way of avoiding judgment for committing suicide. The word 'surprise' in the line 'surprise mon (mom) and dad ive known I was trans since i was 13' allowed the note-writer to convey a serious identity admission in a quip manner. By this, humour can be construed as a façade for self-mitigating measures expressed by a note-writer to make a concept or emotion appear less serious.

The minimal presence of humour in the suicide corpora investigated is consistent with the findings of Jacobs (1967) who only found four reflections of humour out of the 112 notes he investigated. Similarly, O'Donnell, Farmer, and Catalan (1993) described one humour occurrence in their 37 suicide notes. In a more recent investigation, Shapero (2011) reported that at least nine percent of the genuine suicide notes he investigated manifested incidences of humour.

Meta-Category Memory

With only one occurrence in the current corpora, memory shares similar concepts with events; however, it is limited only to expressions containing 'do you remember...', 'do you remember when', and 'you remember the time...' (Shapero, 2011). In this study, memory is related to escalated justifications imposed by note-writers in their suicide note. Hence, this meta-category is seen to share mutually exclusive characteristics with event. A sample note that manifested memory is presented as follows:

> **SNE No. 12-M-52**
> Dear [Marie],
> For 23 years we lived happy together. Our married life was ideal, until two years ago when I witnessed [June] die in the hospital something snapped in me. You remember when I returned from the hospital I broke down. That was the beginning of my illness. Since then my condition was getting progressively worse, I could neither work or think logically......

The line 'You remember when I returned from the hospital I broke down' shows a part of the narrative that propounded the justification of the note-writer for committing suicide. Overtly, the phrase 'you remember when' highlights the concept of memory as a meta-category that is expectedly associated with recalling experiences. As the primary framework of this investigation, the study of Shapero (2011) reported 15% of memory occurrence in the genuine suicide notes he analyzed. This figure is seen approximately 14% less in the current suicide corpora investigated.

Finally, this study yielded no findings on the meta-categories how, where, and trivia since none of the Filipino note-writers categorically mentioned or gave details on the methods (i.e., shooting, hanging) they have used for suicide and their location where they performed the suicide act. Further, there are no mentions of responsibilities that can stand as trivia as most note-writers settled to leave more instructions related to their funeral, things, and other non-trivial requests. Overtly, the non-presence of how, trivia, and where is associated with the sensitivity and privacy concerns that these meta-categories may indicate in suicide notes. By this, Filipino note-writers are viewed to conceal these details as they see these as too critical and private to be disclosed in their suicide notes.

Conclusion and Recommendations

Filipino suicide completers wrote their suicide notes with reasons or justifications for committing suicide, recall of events and memories, and instructions to people. As far meta-categories are concerned, the primary meta-categorical function of a suicide note in the Philippines is to provide reasons for suicide.

The examination of meta-categories in this study can give valuable insights in establishing the genuineness of a disputed suicide note in the Philippines' current practice of fraud analysis. This may also generate alternative paradigms of characterizing the conventional and unconventional patterns of suicide notes as far as meta-categories in linguistic features are concerned. Finally, future endeavors on suicide may embark on larger Filipino suicide corpora for a broader scope and interpretation of meta-categories, characterize the language of gender in terms of meta-categories in suicide notes, typify the characteristics of meta-categories between English and Filipino-written suicide notes, and distinguish the similarities and differences of meta-categories in suicide notes written by suicide-completers and attempters in the Philippines.

Finally, some limitations are essential to be accounted for in this study. The first limitation is related to the corpora examined in this study. The 59 suicide notes investigated may be small. As a consequence, the findings of this study may not be entirely generalizable to describe the phenomenon of meta-categories present in Philippine suicide notes. However, the results and findings suggest patterns and means of investigating meta-categories in suicide notes through the lens of linguistic methodologies. With this, future studies on the same niche may include a broader scope of suicide notes from multiple sources and diverse groups of Filipino suicide-completers. Meanwhile, the second limitation is accounted to the framework of analysis employed in this study. Shapero's (2011) Framework for Meta-Categories may be limited in terms of identifying, capturing, and describing other unique and distinct features that hovered in Philippine suicide notes. Nevertheless, the findings and interpretations yielded are good starting points to explain the occurrence of meta-categories in genuine suicide notes for this pilot forensic discourse-based study in the Philippines.

Acknowledgement

This paper is a component of the research project entitled 'Forensic Discourse Analysis on Suicide Notes' funded by the Philippine Commission on Higher Education under its K12 Transition Program Scholarship for Graduate Studies – Local's Dissertation and Thesis Grant.

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Explored Feelings of Neglect Among Frontline Nurses in Cabanatuan City During Covid -19 Pandemic: A Photovoice Study

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Abstract - The prevalence of COVID-19 has tremendously affected the health care delivery system and in the light of addressing issues as a matter of concern, this study explored feelings of neglect among frontline nurses during COVID-19 pandemic crisis. The researchers investigated the nurse participants insights regarding their feelings of neglect, issues and challenges they face, and the possible solutions to these findings. A photovoice research design was used revealing 6 major themes namely, Risk to personal health and safety, Inadequate time for self and family, Job-related physical stress, Emotional effect to the current situation, Job dissatisfaction, and Risk to loved ones. The findings of this research indicate that nurses as frontlines of providing health care services during COVID-19 pandemic experienced feelings of neglect and these experiences resulted to negative impact that needs to be addressed. Further, most of the nurse participants emphasized that the government should support them and also improve the occupational policies to protect their health and safety. From all these findings, a NO-NEGLECT Program was formulated that will specifically address the issues of concern to this undertaking for improvement and empowerment.

Keywords - COVID-19, feelings of neglect, frontline nurses, photovoice

Introduction

Nursing, as a career built entirely on compassionate and personal care, is a high-stress occupation, and in such an environment, negative emotions are bound to emerge. According to Najimi (2012), nursing is a naturally stressful job. Different individuals experience different levels of emotional crisis, but it is especially harder for nurses who are at the center of the Coronavirus Disease 2019 (COVID-19) pandemic.

In December 31, 2019, China reported a cluster of pneumonia cases in Wuhan which was eventually identified as due to a new viral pathogen called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The World Health Organization (WHO) classified COVID-19 as a pandemic on March 11, 2020. During the first few months of the outbreak, Central Luzon – Region III ranked second as the region with the greatest number of patients under investigation for COVID-19, following the National Capital Region. The number of healthcare personnel, including physicians, nursing staff, and other medical professionals, accounted to a high of more than 20% of those infected in the Philippines in 2020, making them one of the most vulnerable occupational groups in the country. The anxiety brought about by public uncertainty about the new disease and misgivings about the appropriate response to the virus was exacerbated by news of global shortage in Personal Protective Equipment (PPE) like surgical masks, as well as disinfectants and sanitizers. The PPE shortage left doctors, nurses and other frontline workers dangerously ill-equipped to care for COVID-19 patients. Adding to the scare was the high morbidity and mortality rate of the infection indicating the frightening virulence and lethality of the pathogen. There are reports of asymptomatic carriers of the Coronavirus – a person might pass on the virus unknowingly to a vulnerable loved one which adds significantly to the fear and anxiety experienced by frontline nurses. All these on top of the problems the nursing profession has been facing for years.

Further, nurses in the Philippines are receiving the lowest compensation among the countries in Southeast Asia. Experienced registered nurses earn about ₱ 40,381 a month in the Philippines, more than 50% less than Vietnam, the country with the second lowest paid nurses in the region. Further, nurses with aspirations to work abroad in the hopes of a better future are facing difficulties due to overseas deployment bans imposed in the country. With this, the personal feeling of neglect has wide consequences on nurses which may lead to anxiety, frustration, and decreased morale which may give rise to reduction in the quality of care rendered to patients. Given the knowledge gap that exists between feelings of neglect of nurses and the various factors that contribute to those feelings their job as frontliners subsume, the researchers believe that a qualitative study is appropriate to elicit and elucidate on the thoughts and insights of nurses as frontliners in the unique situation that is the COVID-19 pandemic.

Methodology

The researchers used photovoice, a qualitative visual research methodology, in exploring feelings of neglect among frontline nurses in Cabanatuan City. This research designed aimed to answer the participants' insights on personal feelings of neglect as frontline nurses in Cabanatuan during the COVID-19 pandemic crisis, challenges, and difficulties they have experienced as a result of the feeling of neglect, and how could these challenges and difficulties be properly addressed. Further, the participants were purposively selected. In order the meet the rigor of this study, the rudiments of qualitative research were strictly observed from data collection to data analysis.

Results and Discussions

Presented in the table below are the subthemes and major themes generated during the data gathering and data analysis of this research study representing explored feelings of neglect among the nurse participants.

Table 1 Fina l Thematic Map for Generated Subthemes and Major Themes

Subthemes	Major Themes
▪ Hurt ▪ Frustration ▪ Disillusionment ▪ Sadness ▪ Concern for mental health	Emotions Corollary to the Current Situation
▪ Overwork ▪ Endured Hardships	Job-related Physical Stress
▪ Low salary ▪ Poor working conditions (long shifts, inadequate staffing) ▪ Unfavorable work environment (no privacy, poor ventilation, work area exposed to patients) ▪ Government-mandated issues (caps on overseas deployment)	General job dissatisfaction
▪ Risk to safety (inadequate supply of PPE) ▪ Risk to health (cannot eat, cannot urinate when needed during shifts; being too hot inside PPE for extended periods)	Risk to personal health and safety
▪ No holidays/celebrations ▪ No time to rest and recharge ▪ No time for chores/errands ▪ No time for family	Inadequate time for self and family
▪ Fear of bringing virus and contaminating home ▪ Fear of infecting loved ones	Risk to loved ones

Theme 1: Emotions Corollary to the Current Situation

Initial coding for statements or phrases describing feelings of being upset or annoyed, or feelings of being stuck in a situation, and of being powerless to change something were categorized under the theme of Emotions Corollary to the Current Situation. Codes grouped under this theme include sadness, frustration, disillusionment, and feelings of hurt and pain. The following statements were derived from the participants-based form their interpretations from the photos taken.

Figure 1. Photovoice Piece: "Never let gold become your god" Tricycle Sticker.

"I find the situation funny in an ironic way. The sticker says "Never let gold become your god" na para bang ang gahaman ko sapera 'pag nanghihingi kami ng dagdag-sahod pero nakasakay ako sa traysikel. Kumbaga, sasakyang pang-mahirap – ng commuter. Struggle na nga eh. Nakakatawa lang. (like I am too greedy for money for asking for additional compensation, but here I am riding a tricycle – considered a poor commuter's mode of transportation. It's really a struggle. It's ironically funny.)." NP1.

"I have been working for years and I still can't afford (to buy) my own (means) of transportation." NP1.

Figure 2. Photovoice Piece: ATM Salary Card.

"…my salary always infuriates me. Palagi nalang kaming nagtitiis. Wala kami magawa. Hindi kami pwedeng magdemand ng more benefits kasi hindi naman kami pinapansin. Hindi naman kami pwede mag-welga for "humanitarian reasons". We feel like we're stuck between a rock and a hard place. (We are always expected to endure. We feel there is nothing we can do about it. We cannot demand for more benefits because we feel we are not listened to. Of course, we cannot go on a strike for humanitarian reasons.)." NP1.

This is the collective grievance of the members of the nursing profession. They are frustrated – understandably – for a number of reasons. Foremost of which is because they feel they are underappreciated and not compensated aptly. In his study in 2018, Khalid suggested that to promote and encourage high productivity and high financial turnover, employee well-being and perception should be given adequate attention - and to achieve those goals, effective compensation policies for employees should be in place. The sentiments expressed are manifestations of frustration, which, when long-standing, may lead to burnout. According to the WHO, burnout is state resulting from long-term work-related stress. Of course, it can affect people working in all professions, but those in the healthcare field, especially frontline nurses, are more likely to experience it due to the current pandemic. This makes sense, as they are looking after patients in their weakest and most tremulous and tumultuous moments. The importance of recognizing the signs and symptoms of frustration, which may herald burnout, cannot be overemphasized (Kelbach, 2020).

Figure 3. Photovoice piece: Surgical Staples.

"(Physicians) blame mostly the nurses when they cannot find where their (surgical) instruments are, or where the medical charts are when they make rounds. On top of the stress and frustration we suffer from own lives and jobs, we also absorb the stress and frustration experienced by physicians as well. This photo was taken when the surgeon had to do without his usual nursing support staff." NP2.

"It's just saddening that nurses sometimes take all the blame. We are like the shock-absorbers of stress." NP2.

The occasionally disrespectful approach to nurses by physicians may be due to the stress of the current situation or may be due to an inherent negative trait of the offender (Grissinger, 2017). Either way, it is a destructive behavior towards nurses, as it may give rise to undermined staff morale, unhealthy work environment, and restricted further communication and collaboration. A qualitative study by Donahue in 2020 explored nurses' frustrations due to feeling disrespected. The experiences were represented by the following themes: "being powerless, feeling like a nobody, being treated like one is "stupid", "feeling of discouragement", and "creation of broken social connections". Disrespect towards nurses is ultimately harmful to the patient because it may lead to errors, problems with patient safety, and other adverse events (McNamara, 2012).

Theme 2: Job-related Physical Stress

The operational definition of Job-related Physical Stress, as used in the study, refer to issues of bodily discomfort secondary to the observation of one's duty such as body aches, sleepiness at the workplace, inability to ease one's urges such as urination as needed while on duty, among others, due to being overworked.

Figure 4. Photovoice piece: Patient Logbook.

> "I chose a picture of a logbook in the hospital workplace because I want to say that while the patient logbook may readily show the large number of patients that we take care of, and by itself (the large number of patients), it already shows that we are overworked. And what's funny is that that logbook does not even begin to show the unwritten, unrecorded hardships we have to endure –'yung mga meal times na hindi naming na-take dahil sadami ng work, yung mga bathroom breaks na hindi namin maitake kasi mag-dodoff and magdo-don na naman ng PPE, the times we could not go home to our loved ones because we are afraid we might contaminate our homes and infect our loved ones, 'yung mga panahon na hindi kami nakakapagpahinga at nag-eextend ng trabaho dahil understaffed (And what's funny is that the logbook does not even begin to show the unwritten, unrecorded hardships we have to endure – the meal times we were not able to take due to the large amount of work, the bathroom breaks we were not able to take due to limitations in the number and logistics of use – donning and doffing – of PPEs, the time we could not go home to our loved ones because we are afraid we might contaminate our homes and infect our loved ones, the times we cannot rest because we had to extend our working hours due to understaffing issues)".NP1.

For decades, staff nurses in healthcare institutions in the country complain of being understaffed and many are facing mandatory and poorly compensated overtime. Pressing or coercing nurses who are already stressed and overworked to further work overtime puts them at additional risk and distress. The pandemic has revealed that the national health system lacks adequate staffing contingency plans for the overflow of outbreak patients. Some health administrators in the country have suggested ideas like allowing all student nurses to graduate and pass the boards to add to the strained workforce, but most of these ideas are not feasible nor sustainable (Kelbach, 2020).

Figure 5. Photovoice piece: “Dead Tired” Gloves.

In the same vein, NP2 narrates she took the picture of the surgical gloves as she was putting on her PPE just before beginning her shift. The gloves were “slumped” on the table, seemingly “dead tired” despite being new and unused. She has just come from sleeping at home after her preceding shift, and she claims she was feeling what the gloves were “feeling” – she was “fresh” (new) from sleeping at home, and just starting her new shift for the day, but she feels dead tired and exhausted. She feels she can’t seem to physically recover from the heavy workload of her job. She hopes for better working conditions and more humane working hours for nurses.

Thompson, in his 2019 research paper asserted that fatigue due to overwork in the nursing workforce gives rise to a multitude of health and safety consequences at the individual level. Long hours spent at work and compressed work schedules are commonly encountered in the healthcare industry, and more so in the nursing profession. These demanding work schedules may lead to problems with sleeping because of the necessity of sleeping at irregular times and at times that are out of phase with circadian rhythms due to the nature of the profession (Caruso, 2013). Further, continuous shift schedules and long work hours carry an increased risk for reduced performance on the job, obesity, injuries, and a wide range of chronic diseases. In addition, fatigue-related errors could potentially harm patients. Further, it is worth mentioning that nurse overwork may also negatively impact delivery of care. Stimpfel, Sloan, and Aikel, in 2012, did a study on the impact of the physical burden of nurses on patient perception and satisfaction. The study revealed that work shifts which last longer than 13 hours were connected to patient dissatisfaction. The patients reported that the affected nurses were not communicating well and were less attentive to their needs.

Theme 3: General Job Dissatisfaction

This theme represents the participant’s feelings of neglect through the mechanism of job dissatisfaction. Included under this theme are the tangible, palpable, and concrete factors relating to job dissatisfaction. For clarity, the more covert and emotional manifestations associated with job dissatisfaction (like sadness, frustration, and disillusionment) were included under the theme of Emotions Corollary to the Current Situation, while the more overt and “physical” manifestations were categorized under theme of General Job Dissatisfaction (such as low wages, poor working conditions, and unfavourable work environment, among others).

Figure 6. Photovoice piece: Duty Schedule.

> “This is why most of the healthcare providers, particularly nurses, do not have relationships. They are too busy (working and) resting to bother looking for Mr. Right.”NP6.
>
> “Where we work is where we eat. We couldn’t even enjoy some degree of privacy to take our meals and rest during break time even for just a few minutes.”NP4.

Figure 7. Photovoice piece: Poor Working Conditions.

In this photograph, one can see a small nurses’ worktable cluttered with paperwork, along with food in Styrofoam bowls. The worktable is positioned very, very close to a patient’s hospital bed. The participants narrated that this represents the poor working conditions of nurses that contribute to his own personal feelings of neglect.

> “I feel pity para sa akin at sa aking mga kasamahan dahil hindi man lang kami makakain nang tama at may privacy during our break, as well as fear dahil sa kasagsagan ng COVID-19 ay kumakain pa din kami sa harapan at malapit sa mga pasyente (I feel pity for myself and my workmates because we couldn’t even eat properly in private during our break, as

> well as fear because at the height of the COVID-19 pandemic, we are still taking our meals in front of and in close proximity to patients)."NP4.

In Bakotic's study in 2016, she claimed that job satisfaction is a highly complex concept that may be affected by a variety of factors, or more accurately by a group of factors, that often have entwined and cumulative impact. She added that employees who are satisfied with their jobs generally love their work, feel justice in the workplace, and feel that their job gives them variety, a healthy challenge, good compensation and job security, among others. Further, with respect to the more palpable indicators of job satisfaction, nurses tend to be more inclined to be satisfied with their jobs if they were happy with their wages, benefits, amount of workload, and with the degree of support they receive from their respective healthcare institutions (Lyons and Akroyd, 2014).

All of the participants in this study feel they are overworked and undercompensated. Bills and expenses are rising, but their wages and benefits remain inadequate, as they have for years. To address the feelings of neglect secondary to job dissatisfaction, the participants believe that administrators and managers should understand and recognize that nurses are also individuals with lives outside the sphere of their jobs, and that job satisfaction, when felt by the nursing workforce, will lead to better productivity and work effort. Higher wage rates, more benefits, work-life balance, and opportunities for career growth would go a long way, according to the participants.

Theme 4: Risk to Personal Health and Safety

Figure 8. Photovoice piece: Hospital Beds Too Close to Each Other.

One of the nurse participants submitted a picture of hospital beds lined up positioned too close to each other, despite the nationwide mandate for physical distancing. As they, the frontliners spend most of their time within the hospital premises, the close proximity of patients to each other may lead to higher rates of infection within the hospital – which places the frontliners at even higher risk of acquiring the disease.

> "Neglect ito para sa akin kasi this is considered disregard for the possible spread of the virus in the hospital, where we work. Nakakasakit ng damdamin (I consider this neglect because this represents disregard for the possible spread of the virus in the hospital where we work. It hurts my feelings.)." NP4.

> "Hospital pa mismo ang hindi nakaka-comply sa physical distancing. (The hospital, supposed to the bastion of proper infection control measures, is even the one violating the health protocols)" NP4.

Figure 9. Photovoice piece: Minimal PPE.

> "This is the bare minimum of protection, which would not actually protect us against the extreme condition of our jobs, as we are working in close proximity to COVID-positive patients." NP4.

In his opinion, frontliners should be wearing the prescribed level of protection, especially those like him in greatest risk for infection. The mask should be of the N95 type, and the PPE should be a disposable body suit, according to the participant. He says there is always the fear of contracting the virus with the current level of protection available to him at work.

An article from Registerednursing.org stated that while frontline nurses in the Philippines are strong-willed and determined to face the COVID-19 pandemic, they are desperately struggling with the inadequacy of available PPEs. There are reports of healthcare staff in rural areas of the country using simple homemade cloth masks as an alternative for proper surgical masks. This sad truth is rationalized as such: everyone understands that cloth masks provide far from sufficient protection, but it's a better alternative than wearing nothing. The ill supply of PPE can cause sizable health hazards and risks for front liners and their patients' health.

Figure 10. Photovoice piece: Wearing Inappropriate PPE Protection.

"This picture speaks of the neglect I experience as a frontliner in a way because I oftentimes feel that we are just wearing the bare minimum of PPE protection. If it were up to me, I'd like us frontliners to have much better protection. What we are wearing at work is far from adequate to afford us the amount of protection that we need due to the veracity of the opponent we are facing. Kami ay palaging may takot na kami ay mahahawahan ng COVID (We are always in fear of contracting COVID)." NP6.

Figure 11. Wrinkly Hand

"Tuwing kami ay nagduduty, kadalasan ay tuloy-tuloy na ang mga oras na nakasuot kami ng surgical gloves. Resulta ay babad na babad ang kamay ko sa pawis dahil sa init. Hindi lang kamay ko ang napapawisan ng ganito kung hindi pati ang buong katawan. Minsan ay hindi ko maiwasan na maisip kung ito ay healthy pa ba para sa amin, nakasuot ng kulob at mainit sa mahabangoras at panahon. May mgapagkakataon na parang sumasama at bumibigat ang pakiramdam ko dahil sa matagal at matinding init" NP3.

Figure 12. Crowded and Exposed

The participant also shared another photo which he feels speaks strongly of the neglect he and his colleagues endure - a photo showing their sleeping conditions at the hospital. He laments that this is where they sleep in between shifts at the hospital. They only have the hallway to sleep in. They do not have separate rooms.

> "This is where we rest in between shifts. We are positioned together in the hallway. Of course, in this set-up, there is always the fear of the possibility of infection if ever one of us is an asymptomatic carrier. This speaks of neglect since we believe we should be provided with proper separate rooms each to let us maximize our rest periods, and more importantly to lessen the risk of spread of infection among us." NP3.

Figure 13. Photovoice piece: Meal in a Box

> "Most of my meals now come in disposable containers like this. I have not been able to enjoy a proper meal during my shifts since the pandemic started."NP3.

> "This picture speaks of neglect dahil sa dami ng aming mga ginagawang trabaho sa aming shift ay minsa nkonti lang ang aking nakakain at madalas ay hindi pa at dahil dito, ilang beses na akong umuuwi ng masakit ang tiyan dahil sa pagkalipas ng gutom (This picture speaks of neglect because due to the heavy workload of nurses, I sometimes get to eat a little, oftentimes not even – and due to this, I sometimes suffer from occasional stomach pain)" NP3.

> "I am the type of person that is capable of handling work even for long periods of time, as long I am given enough time to eat my meal properly to recharge. I feel nakulang ang pagkakaintindi ng tao dito, na kailangan naming ng personal time para makapag-unwind or recharge kahit panandalian lang (I feel most people are not aware of this, that we need personal time to unwind and recharge)." NP3.

Health and safety in the workplace should never be overlooked, especially in critical situations like the current pandemic. The nursing profession is involved with a higher incidence of work-related health and safety risks than other occupations because nurses serve on the frontlines in a complicated and difficult healthcare system (Park and Lee, 2016). Also, the participants feel that these concerns may be addressed by affording them PPE of the highest recommended level, not simply with what is available. They believe that proper planning and health surveillance could have mitigated the inadequacy of PPE for frontliners. They also stated that they wish administrators would give some priority for the health of the frontliner nurses.

Theme 5: Inadequate Time for Self and Family

Figure 14. Photovoice piece: Church with Holiday Lights

> "At any day, at any minute, we can be called suddenly to come in for duty, without any prior notice. As a result, we can't plan vacations or holidays like in our respective provinces, as we cannot be too far away from our place of work because we are always considered on-call. I can only count the times I was able to have a decent vacation since I started working." NP6.

A study by Simmons (2012) stated that leisure time should be balanced to live a healthy life. But all too often, the demands of work take precedence over nurses' needs. Nurses, who are shift workers, may sometimes experience loneliness and isolation due to inadequate time for self and family. Administrators and key decision makers should recognize that aside from work issues experienced by nurses, there are also pressures at home which include financial problems, family issues, daily chores, children's activities, ongoing adult education for the nurse, and in the Philippines where the culture includes extended families, elder care. For a balanced life, responsibilities at home need to be balanced with responsibilities at work.

Figure 15. Photovoice piece: Undone Laundry

> "I feel I fail to catch up on doing chores most of the time. I always come home very tired, go to sleep, and then work again. I don't feel recharged at all. Doing laundry always becomes less of a priority, leading to mounds of laundry to be done. Of course, it does not include clothes I wear at work, since I always make sure to separate them from other clothes. I make sure to immediately soak them overnight to kill microbes and then wash and rinse them in the morning. This represents the feeling of neglect for me because my work consumes everything, all the time and energy, in my life. I feel like all I do is work and work and continuously fail to put my other affairs in order." NP2

Theme 6: Risk to Loved Ones

Figure 16. Non-disposable PPE

Participant NP5, through her photovoice submission above – a picture of a frontline nurse wearing non-disposable PPE – expresses her feelings of neglect as manifested by the constant fear of passing on the virus in case of infection to her loved ones. She emphasized that PPEs should be made disposable and not washable to minimize the probability of bringing the pathogenic virus home to loved ones.

> "This picture reminds me of the time there was a shortage of PPEs for us when we were battling the pandemic. We were so fearful of contracting the virus or bringing it home to our loved ones. "We hope to have been better protected, sampu ng aking mga kasamahan at kapamilya. Hindi lang kami ang exposed, by extension, pati ang aming family. We are in constant fear na baka sa amin pa manggaling ang ikakasakit at ikakasama ng kalusugan ng aming pamilya dahil sa banta ng COVID transmissibility."

In an editorial in the Journal of Family Nursing (2020), families and interrelationships are strained and are under tremendous stress during the COVID-19 pandemic. In a paper by Galehdar, N., Kamran, A., Toulabi, T. et al. (2020), they reported that one important factor that contributes to a frontliner's distress is the constant fear of infecting family members. The experience of the participants in the study showed that they could not have close physical contact with their loved ones at home because of the risk of being a potential carrier. On their way to return home from the healthcare facilities, the nurse frontliners have always had fear and anxiety about being a carrier.

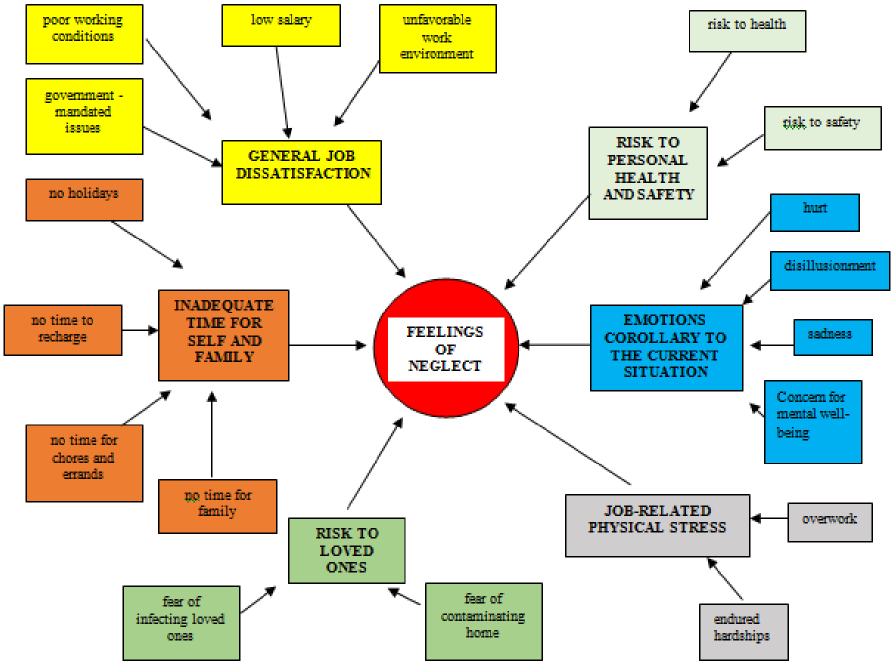

Figure 17. Conceptual Model of the Elements of Experience Impacting Feelings of Neglect Among Frontline Nurses

Through the submitted photovoice pieces and participant interviews, the researhers were able to formulate a conceptual model to show the elements of experience reported by participants which impact their feelings of neglect. The central circle labeled Feelings of Neglect represent the participants' current sentiment deriving from the present status of their life as an overlooked nurse frontliner during the pandemic. The details enclosed in boxes embody the mechanisms that have relevance to the characterization of the sentiment under study. Represented in the diagram are the six (6) overarching themes (highlighted, in bold) located in closer proximity to the central circle, and the contributory factors to each element in the more distal boxes. The arrows convey the contributory nature of the factor in the tail end to the corresponding item in the arrowhead.

Proposed Empowerment Program

Despite the negative feelings associated with the discovery of the reality of the situation of the nurse frontliners "in the trenches", the researchers found solace in the thought that thanks to the experiences shared to them, they were able to reflect on the current situation and develop an empowerment program in the hope of improving the situation of the frontliners and mitigate, at the least, their feelings of neglect. One of the most preeminent and important elements of photovoice is its potential to contribute to empowerment of marginalized groups. The participants understood and wholly supported the idea that their contributions could lead to initiatives that may help find solutions to issues that impact their lives as frontline nurses in the COVID-19 pandemic.

Through the knowledge and insights gained from this study, the researchers developed a program aimed at potentially mitigating the feelings of neglect of nurses serving as frontliners: The NO-NEGLECT Empowerment Program.

The No-Neglect Empowerment Program

The program contains nine (9) initiatives, representing each letter: (1) Nursing leadership development, (2) Occupational health and safety, (3) Networked learning, (4) Employee coaching, (5) Greater participation in policy development and decision-making, (6) Legal proficiency, (7) Employee relations, (8) Change management, and (9) Therapy.

NO-NEGLECT EMPOWERMENT Program			
	Initiatives	**Core Strategies**	**Rationale**
N	Nursing Leadership Development	Seminars on leading intra- and interprofessional teams	Nurses are at the center of the health interdisciplinary team, and it is important that they be trained to function in this high-stakes environment. This is especially crucial in crisis situations with a continually changing landscape like the COVID-19 pandemic.
		Seminars on leadership skills focused on client and healthcare teams	It is important to understand that the nurses are at the first level of decision making in healthcare, and further training may help them be comfortable in leading in the nursing role.
O	Occupational Health and Safety	Seminars on occupational health and safety knowledge	The ability of nursing frontliners to apply occupational health and safety principles, techniques, and practices ensure safety and health in the workplace. This particularly essential and urgent at present due to the pandemic.
		Provision of Adequate Personal Protective Equipment	Some nursing frontliners feel that the current rationing of PPE leaves them vulnerable to the infection due to limited allocation, as they have to use a single set with multiple patients, and sometimes forego taking meals and bathroom breaks just to preserve their PPEs.
		Seminars on risk communication and community engagement	As the community has a crucial role in the containment of the pandemic, nurses should learn and understand how to effectively communicate with and engage the community in stopping the spread of COVID-19

		Policies which support reasonable shift schedules for nurses	Nurses should be given enough rest, sleep, and recovery time to prevent burnout and to help decrease risk of exposure to the virus.
-			
N	Networked Learning	Open online courses which connect educators and nursing learners	Collaborative Internet-based education will allow nursing learners to connect with and learn from experts and from other resources, as well as from other groups of learners to improve their knowledge base and stay abreast of current and latest developments in the practice, especially during precarious crisis situations like the COVID-19 pandemic
E	Employee Coaching	Seminars and workshops on how to create and develop performance setting and assessment methods	This aims to create an enabling environment which will lead to sustained performance-based coaching culture in the field of nursing
G	Greater Participation in Policy Development and Decision-making	Platform to advocate for policies to improve their own working conditions Seminars on political knowledge regarding health systems and relevant policies directly affecting the practice of nursing	Nursing frontliners are experiencing neglect in the conduct of their profession as the first line of defense in this pandemic. They have been calling for more effective protection at work, reasonable shift schedules, and just compensation, among others. Nurses would benefit from learning how to properly and effectively influence the formulation of policies related to the nursing profession, with the aim of eventually improving the working conditions of nurses in the Philippines
L	Legal Proficiency	Seminars on laws, rules, and regulations on labor issues	This will help improve the knowledge of nurses on labor issues such as available legal resources regarding employee responsibilities, conduct, compensation and benefits, and procedures for problems or grievances, if needed
E	Employee Relations	Policies and programs that foster harmonious relationships among administrators, physicians, nurses, and other members of the healthcare team	Administrative support to create and sustain good employee relations and productive team activities in the workplace will improve the morale, motivation, and

			ultimately, productivity of nursing frontliners.
C	Change Management	Seminars and programs to understand and effectively implement organizational and workplace changes to adapt for sudden changes due to the pandemic	The ever-changing quality and continuous evolution of SARS-CoV-2 often calls for rapid and sudden changes in the practice of pandemic healthcare. Rules and recommendations are fluid, and are commonly only applicable according to the present data available. Nurses should be armed with the knowledge of how to recognize and plan for changes, to coordinate programs on change initiatives, and to seek out improved ways of doing tasks.
T	Therapy	Seminars on stress management and coping strategies Available psychological, psychiatric, or similar services for counseling	Nursing frontliners are highly stressed, especially during the current pandemic. Strategies and coping techniques (such as meditation, yoga, journaling, and similar proactive activities) may help reduce stress. Some nursing frontliners may benefit from individualized professional evidence-based programs for the alleviation of stress, anxiety, and other negative emotions related to the performance of their duties

Conclusion and Recommendations

The findings of this research study demonstrate the usefulness and practicality of the participatory action method photovoice in the facilitation of the exploration of deep-seated emotions of participants concerning their own feelings of neglect as a frontline nurse during the pandemic. The study allowed the researchers to acquire a deeper understanding of the feelings of neglect of the frontline nurses, obtaining a body of knowledge representative of what is seen through the eyes of the participants. Six (6) frontline nurses were recruited as participants who took photos and created captions representing their first-hand experiences of neglect during the COVID-19 pandemic in Cabanatuan city. The investigators engaged the participants in online interviews and discussions to explore their insights and issues. The data used in this study were photographs, narratives, and interviews which were analyzed using the six (6) phases of thematic analysis.

Further, the researchers were able to explore the feelings of neglect of frontline nurses using photovoice and thematic analysis and came up with six (6) overarching themes defining the elements of experience that impact their feelings of neglect: (1) risk to personal health and safety, (2) inadequate time for self and family, (3) job-related physical stress, (4) emotions corollary to the current situation, (5) general job dissatisfaction, and (6) risk to loved ones.

This study adds to the knowledge of the utility of photovoice in the exploration of social issues experienced by frontline nurses which may serve to widen the understanding of people regarding the various levels of concern on feelings of neglect faced by the participants. According to Barrientos (2017), the photovoice method encourages the participants to be the protagonists of their own issues, allowing them to be part of the formulation of possible solutions to their concerns. As a result of interactions with participants, through photovoice, an empowerment program was developed based on the insights gathered from the participants.

The information gathered from the exploration of feelings of neglect experienced by frontline nurses may contribute to future strategies for enhanced pandemic response and development and improvement of plans and protocols to bolster nurses' preparedness in crisis management (Al Thobaity, 2020). The reserachers documented the use of the participatory action method photovoice in the exploration of neglect which policy-makers, decision-makers, and institution heads can use to meaningfully assess and address the current issues facing frontline nurses in the Philippines for the future improvement of the crisis response preparedness and staff resilience of nurses as one of the most critical lines of defense in the COVID-19 pandemic.

Moreover, the findings of this study may be used to promote awareness and possibly engage mixed and heterogeneous audiences to listen to the plight of the nation's nurses as they face this pandemic. The hope of the researchers is for various stakeholders such as managers, administrators, and key decision-makers to be informed of the concerns of the frontliners mentioned in this study, and include these factors on future decision-making and planning sessions regarding the nursing profession as pandemic frontliners.

Recommendations are geared towards nurse empowerment by remaining attuned of the hospitals and other health organizations to the needs and issues of our frontline nurses to be able to address them adequately and in a timely manner. This includes their health, safety, financial, and social needs. Additionally, healthcare leaders should conduct regular assessment of nurse staffing numbers to make sure that patient safety and , nurse health are protected, integration of crisis management and resiliency strategies to nursing curriculum to better prepare the students for any unexpected healthcare crises during his/her career. Also, creation of intervention policies for crisis brought by challenges and issues of the predicament of COVID- 19 pandemic crisis and fostering a strong relationship that will provide a culturing of peace, unity an accountability among health care delivery system.

Acknowledgement

The researchers would like to acknowledge all the participants of this undertaking, the frontliners who are selflessly giving their unconditional love, commitment and passion to fight COVID-19 pandemic and the Asia Pacific Consortium of Researchers and Educations (APCoRE) for the opportunity of being able to present this paper and share the significance of its empirical findings.

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Perspectives and Stress Coping Mechanisms of Selected KSU Students during the Covid 19 Pandemic

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Abstract - Many sectors were undoubtedly affected by the implementation of lockdown since March of last year due to the spread of coronavirus. The health crisis had an adverse effect to the world economy, business, employment, and to the education sector too. Educational institutions have transitioned from traditional classroom teaching and learning to distance learning which has concerned the different stakeholders. This descriptive study focused on the perspectives of the tertiary students about the learning modalities adopted by Kalinga State University amidst the pandemic. Also, it aimed at looking into the strategies of the students in coping with stress while they continue their studies during this pandemic. An online questionnaire made through Google Forms was utilized to gather the needed information. There were 95 students enrolled in subjects with calculations who participated in the research. This study noted that there is no significant difference on the perspectives of the students when grouped according to sex but dithe fference was established when responses of students are grouped according to year level. The students are pessimistic about distance learning. More than half of them disagreed that distance learning gave them higher learning satisfaction than classroom learning. The study recommended among others the proposal of a more flexible approach of delivery of instruction among the students and programs that would teach our students options in coping with stress suitable to their year level.

Keywords - Covid 19 pandemic; Distance learning; Classroom learning; Subjects with calculations; Stress coping mechanisms

Introduction

Covid 19 pandemic has brought unpremeditated changes in every person's lives. It has affected different aspects and fields worldwide. These include the education sector which was truly challenged since the announcement of lockdown in March 2020. It resulted to the suspension of face-to-face classes worldwide and transitions education to online or digital mode (Chen, Peng, Yin, Rong, Yang, & Cong, 2020) (Fadilla, Nopitasari, & Pradja, 2020). Online learning has been seen as one of the primary alternative solutions to continue to education amidst the pandemic (Basil aia & Kvavadze, 2020; Taha et al,.2020). The use of online mode of teaching and learning is said to be practical as it can be done anywhere and anytime (Nakamura et al, 2018).

In China, primary school up to tertiary school students were restricted to go to school and encouraged to study independently at home (Wijaya, 2020). Many Indonesian lecturers have utilized the learning management system (LMS) platform and video conferences to assist the mathematical learning and development of their students amidst the pandemic (Gunawan et al., 2020). The Study from Home (SfH) scheme was then applied to all levels expecting that it should be able to assist the learning process during the Covid 19 pandemic among Indonesian learners (Hidayat, Anisti, Purwadhi, & Wibawa, 2020).

As an effort to continue with the academic works, some universities in Ghana have resorted to the utilization of online learning platform (Anaba, 2020). The lecturers are mandated to conceptualize and develop their own educational model and upload learning materials online for an effective learning exchange (Agormedah, Henaku, Ayte, & Ansah, 2020).

In Georgia, the Ministry of Education, Science, Culture and Sport of Georgia has made the Microsoft teams platform available for all 2086 public schools in the country. The Education Management Information System has created the accounts for all teachers 55000 teachers and 530100 students) and have built-in the virtual classrooms for all classes and relevant subjects by default. Additional online instructions were published for teachers and students to use the system (MES 2020, Ministry of Education, Science, Culture and Sport of Georgia to strengthen distance learning methods).

In response to announcement of lockdown in the Philippines in March 2020, educational leaders have decided to adopt the new normal in education. The implementation of the Learning Continuity Plan (LCP) has been decided by the Department of Education for the basic education level. The opening of classes was also moved instead of June 2020 due to the escalating cases of Covid-19 virus infections (DepEd, 2020). The DepEd have transitioned from face-to-face classes to remote learning with the use of printed modules, telecast discussions, online learning, and teaching. In the higher education sector, higher education institutions were given academic freedom and should implement available distance learning, e-learning, and other alternative modes of delivery to students (CHED, 2020).

With just a short period of time, the education landscape worldwide have inevitably transitioned from the traditional face to face teaching and learning to virtual modes of education. Most of the schools have adopted the e-learning scheme which poses both advantages and disadvantages to the learners as well as educators. One of the seen advantages of the implementation of the online learning is its flexibility. Some of the disadvantages, however, include the unpleasant learning attitude of students, internet signal strength, availability of devices to support the learning, and the financial capacity of learners to avail of the online learning platform (Arkorful & abaidoo, 2015).

In the Philippines, some teachers recorded and uploaded their lessons online for the students to access and some were even more innovative and used Google Classrooms, WebQuest, and other online sites, but a greater majority of teachers are not prepared to deal with online education. After three days of the national memorandum for alternative delivery, the Commission on Higher Education (CHED) suspended the online form of instruction since there was an increase in the number of the students, including teachers who clamoured against the online mode of learning due to different factors. The truth is, numerous higher education institutions, both private and state colleges and universities in the Philippines are not prepared to implement this online system (Toquero, 2020). Akamai (2017) reported that the Philippines has the lowest internet connectivity in Asia. Besides, such challenges would be equity gaps, student's security and safety, quality of learning compromised and poor assessment results (Winthrop, 2020). Changes on the grading system, assessment, and evaluation of student's performance are also challenges to every administrator. In addition, laboratory activities in sciences, and other subjects that require performance such as Physical Education and culture and arts would be limited to paper and pen test, unless schools will require students to be physically present to be assessed through performance tests. In addition, extra-curricular activities in school such as scouting, proms, sports intramurals, contests, and foundation day will be reduced and discontinued. In terms of teaching, teacher training to online instruction, blended learning, and distance learning is also recommended in order to adjust to the new instructional format (Toquero, 2020). This transition to the new normal, from the four corners of the classroom to the borders of virtual reality, every learning institution needs to study how successful online learning is in providing quality education and outcomes-based education to students (Basilaia & Kvavadze, 2020).

These barriers also pose challenges with regards to mathematical education and in learning subjects that involve calculations, challenges that cause stress not only among the educators but more so with the learners. Stress is seen as psycho-physiological process which results from the interaction of an individual with the environment and results in the disturbances caused to the physiological, psychological, and social systems, depending on the individual's characteristics and psychological processes (Akhlaq, Amjad, & Mehmood, 2010). With the stressed brought by the present educational platform, it is with great importance that students know how to cope. Coping is a changing cognitive and behavioural effort to manage specific external and/or internal demands that are seen as exceeding the resources of a person (Folkman and Lazarus, 1998). Muhamad Saiful Bahri Yusoff (2010), on his study Stress, Stressors & Coping Strategies among Secondary School, established the fact that the main stressors of students stress were related to academic. The result of the study showed the top five coping strategies used by the learners such as active coping, positive reinterpretation, religion, use of instrumental support and planning.
In the studies employed in USA, UK and Saudi Arabia, stress among students were caused by high academic workload, difficulty in reading textbooks, family related problems, helath related problems, and financial problems (Al-Sowygh, Alfadley, Al-Saif, & Al-Wadei, 2013; Chao, 2012; Saklofske, Austin, Mastoras, Beaton, & Osbrone, 2012).

Carver and Scheier (2004) investigated university students, and the results showed that problem-focused coping, positive appraisals, and search for social support were commonly used by students in the stressful situation during an exam. The academic source of stress estimated as harmful and threatening.
EUA (2008), Geser (2007), Kauffman (2010), Van Dorp and Monteros (2010), highlighted that stressful events will always be there for distance learning students in educational institutions. What students need to do is find ways in which they can cope and manage. Barley, Fillos, Kelly in Buettner (1990) in a study conducted in the mid-Atlantic region examined exemplary conventional vocational students' stress and how they coped. They found that these students were more likely to use vocational / recreational skills approaches to coping than physiological or sociopsychological approaches. The study found that these students developed strong stress coping strategies through developed skills.

Diederick (1987) identified the significant issues, conflicts and experiences which occurred during the time respondents underwent their first year at institutions. In his study he found out that the subjects were able to cope with stressful events by using the following strategies. They took things slowly, sought psycho-social support from the system, learnt from mistakes, being organised, anticipating problems and kept a calendar.

Yackel (1998) investigated ways of coping used by male subjects in rural public centers in Saskatchewan. Results from the study indicated that task-oriented subjects and relationship-oriented subjects perceived themselves similarly in terms of total frequency and intensity of stress experience. The study also noted that the choice of coping mechanisms was not based on an individual's broad motivational structure of task or person orientation. Methods of coping are not employed as a response to the specific nature of the stresses experienced but rather as a general response. Yackel (1988) then speculated that the selection of coping methods is governed by reasons such as personal likes and dislikes, past experiences, accessibility, cost, social, acceptability, and peer influence.

A study conducted among Grade 9 students in Cagayan De Oro shows that majority of the learners were using emotion focused coping to fight stress. On the contrary, learners do not desire to focus on the main point of the problem. They have not directly acted, simplified and planned independently the sources of their stressful situation. Above all, learners did not find comfortable with problem-focused coping strategy when facing stress. However, respondents also reasonably used the emotion- focused coping strategies .They were shifting the situation into emotions- positive thinking which lead them towards self-determination (Pajo-Sogoc, 2017).

This research study focused on the mechanisms or strategies of students in coping with stress as they undergo the online learning platform amidst Covid-19 pandemic. Also, it looked into the perceptions of students enrolled in subjects with calculations regarding the present educational platform.

Determining the perceptions of students on the new normal learning modalities and their strategies in coping with their calculative subjects somehow benefits the teachers. It will give them a bird's eye view about their students' prior and present knowledge about the changes in their studies, occurring because of the pandemic. It will guide the teachers on how to adjust the learning contents and the strategies on how to effectively deliver such. It may also serve as an eye-opener to teachers as results would give them an idea on the actual situations of the learners. This study could be the baseline of teachers as they craft assessment activities for students.
The result of the study may also benefit the school administration in evaluating the friendliness and effectiveness of its LMS.

Also, the result of the study will benefit the students. They may adopt the strategies or mechanisms of the research participants in order to cope with stress during their studies amidst the pandemic. The parents may also benefit from the result of the study especially in monitoring their children's learning activities and status.

Methodology

The study was conducted in the three campuses of KSU which are located at Dagupan, Bulanao, and in the municipality of Rizal. Students who are enrolled in subjects with calculations like Science and Mathematics were the respondents/participants of the study. This study was descriptive in nature using quantitative methods to collect data. It was carried out using voluntary, confidential, and self-administered survey among KSU students who are enrolled in subjects with calculations for school year 2020-2021. The descriptive survey method is suitable for studies which aim to find out "what is/are," and is frequently used to collect descriptive data (Borg & Gall, 1989).
The study aimed to look into the perspectives of students on the new modes of learning as well as their strategies in in coping with stress while enrolled in calculative subjects with the new mode of learning. To meet the goal, the research participants were students who are enrolled to subjects with calculations for the school year 2020 – 2021 regardless of year level or specialization. Convenient sampling method was utilized in the study considering that not all students have good internet connection. Hence, only those who could conveniently open the research instrument which was circulated virtually through their class group chat were considered as research participants.

Table 1. Research Participants' Profile

N=95

Sex	Percentage
Male	43%
Female	57%
Year Level	
First Year	79%
Second Year	21%
Third Year	0
Fourth Year	0
Marital Status	
Single	100%
Married	0
Widow/Widower	0
Separated	0

The table shows the profile of the research participants as to sex and marital status. It shows that more of the students enrolled in subjects with calculations who have joined the research as participants are female (n=54). Looking into the marital status of the research participants, all of them are single (n=95). Hence, marital status could not be considered as moderator variable in determining if there is significant difference on the perceptions of the students about distance learning as well as their strategies in coping with the new normal trend of learning.

As the research had been delimited to students enrolled in subjects with calculation from school year 2020-2021 of which the distance learning is mostly advised to educational institutions to address the escalating number of Covid 19 cases, most of the research participants were first year students (n=75) and the rest of the participants were sophomores.

A survey questionnaire created through Google Form was used to meet the objectives of the study. The questionnaire was developed and tested by Lisa R. Amir et. Al. (2020) in the study entitled "Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia." A slight modification was done to suit the aim of the study. The internal consistency reliability questionnaire was measured by Cronbach's alpha. Cronbach alpha of the questionnaire was 0.880. The Cronbach's alpha coefficients of each domain were above 0.8, which was considered satisfactory (Amari, Lisa et. al, 2020).

To determine the ways of the students in coping with stress, the brief COPE used by Folkman and Lazarus (1980) was adapted. There were three parts that constitute the questionnaire. First part sought the demographic profile of the students as to sex, course, year level, and marital status. The second part sought answers as to the perceptions of students on the new mode of learning which will be comprised of 17

questions. The last part comprised statements which sought answers on the ways of students in coping with stress as they jive into new normal modalities of learning amid Covid-19 pandemic.
Percentage and other descriptive measures like count, standard deviation, and weighted mean were computed to be able to meaningfully describe the perceptions of the students. To test the hypothesis, T-test were computed with the aid of SPSS.

Results and Discussion

Table 2. Perceptions of the research participants about the learning modalities during the Covid-19 pandemic, grouped according to sex.

Indicators	Male (%)				Female (%)			
	SA	A	D	SD	SA	A	D	SD
1. Group discussion is more suitably delivered in classroom learning	15	73	10	2	22	69	9	0
2. Clarification session is more suitably delivered in distance learning	15	49	32	5	12	56	23	4
3. Assessment activities are done more easily in distance learning	5	71	22	2	15	57	28	0
4. I do not experience stress during distance learning	0	27	63	10	2	19	65	15
5. I do not experience any problems during distance learning	0	34	46	20	13	61	22	4
6. I have more time to study learning materials before group discussion with distance learning	7	61	29	2	2	59	37	2
7. I have more time to review all of the learning materials after class with distance learning	5	73	22	0	6	70	22	2
8. Distance learning gives me higher learning satisfaction than classroom learning	7	29	49	15	5	11	67	17
9. Blended learning (combination of classroom and distance learning) should be implemented in the next semester	27	53	15	5	17	54	22	7
10. Distance learning gives more motivation for self-directed learning and eager to prepare learning materials before group discussion	8	16	74	2	17	54	22	7

Indicators	Male (%)				Female (%)			
	SA	A	D	SD	SA	A	D	SD
11. Communication with lecturers and fellow students is easier with distance learning	5	34	51	10	4	33	52	11
12. I like distance learning more than classroom learning	10	12	51	27	4	15	61	20
13. I study more efficiently with distance learning	5	29	56	10	3	33	57	7
14. Distance learning gives the opportunity for students to cheat during assessment	7	63	25	5	9	59	28	4

Collectively, the students have agreed to the statements cited as to their perceptions about the new modalities of learning during the Covid-19 pandemic. The students have agreed that group discussion is more suitably delivered in classroom learning. This result is consistent with the perspectives of the female students. As to the male students, they agreed more on the note that blended learning should still be implemented in the next semester. Looking into the collective response of the students, this is the perspective that garnered the second highest score. This only means that students are hoping for classroom discussion to be combined with distance learning.

The preference of distance learning over the classroom learning had the lowest rate. Both male and female students (54%, n=95) disagreed that they like distance learning more than the classroom learning. The students also disagreed to the note that they study more efficiently with distance learning. It is also worthy to note that more students (59%, n=95) did not agree that distance learning gave them higher learning satisfaction that the traditional learning. The result zeroes down that as for the students, learning is better when done in the classroom. These results may be attributed to the common complains of the students in the university regarding the poor internet connection in their locality and the lack of gadgets to be used which make it hard to cope with online classes. This is especially when subjects involve calculations and problem solving.

The findings of this study manifests that both male and female students are pessimistic towards online classes amidst the pandemic which is contrary to the findings in the studies of T. Muthuprasad et.al and Lisa R. Amir et al in 2020 that showed preference to online learning over traditional learning among students.

Table 3. The result of the T-test which was used to determine if there is a significant difference on the student's perspectives on the learning modalities during the Covid-19 pandemic when grouped according to sex.

	Sex	N	Mean	Std. Deviation	P-value
Perspectives	Male	41	2.5505	.27257	**0.628**
	Female	54	2.5212	.30546	

Since the p value of .628 is greater that the alpha (.05), the null hypothesis which states that there is no significant difference on the perspectives of KSU students on the new normal learning modalities when grouped according to sex is accepted. Hence, there is no significant difference on the perspectives of KSU students about the learning modalities during the Covid-19 pandemic. It is consistent with the study of the group of H.L. Harvey in 2017 that there is no significant gender difference in the learning satisfaction of online learners.

Table 4. Perceptions of the research participants about the learning modalities during the Covid-19 pandemic, grouped according to year level.

Indicators	1st Year (%)				2nd Year (%)			
	SA	**A**	**D**	**SD**	**SA**	**A**	**D**	**SD**
1. Group discussion is more suitably delivered in classroom learning	19	69	12	0	20	75	0	5
2. Clarification session is more suitably delivered in distance learning	10	57	28	5	25	65	10	0
3. Assessment activities are done more easily in distance learning	11	59	31	0	10	80	5	5
4. I do not experience stress during distance learning	0	19	68	13	5	35	50	10
5. I do not experience any problems during distance learning	0	28	59	13	10	25	40	25
6. I have more time to study learning materials before group discussion with distance learning	1	61	35	3	15	55	30	0
7. I have more time to review all of the learning materials after class with distance learning	4	72	23	1	10	70	20	0
8. Distance learning gives me higher learning satisfaction than classroom learning	4	16	63	18	15	45	10	0
9. Blended learning (combination of classroom and distance learning) should be implemented in the next semester	21	51	20	8	20	65	15	0
10. Distance learning gives more motivation for self-directed learning and eager to prepare learning materials before group discussion	4	53	42	1	5	55	30	10
11. Communication with lecturers and fellow students is easier with distance learning	4	29	59	8	5	50	25	20
12. I like distance learning more than classroom learning	7	9	57	27	5	30	55	10
13. I study more efficiently with distance learning	3	27	61	9	5	50	40	5
14. Distance learning gives the opportunity for students to cheat during assessment	3	68	25	4	30	35	30	5

The table above summarized the student's perspectives on the learning modalities during the Covid-19 pandemic grouped according to year level and agreed to most of the statements cited. Consistent with the result seen in the previous table, more of the students (71%, n=95) agreed that group discussion is done better in classroom learning. One of the tendencies in online group discussion is that other students may not participate well and tend to let their leader do the activity solely if the teacher does not implement effective way of monitoring the students' participation. The students, however, agreed that assessment activities are done more easily in distance learning. This could be due to the fact that they are given more time in accomplishing their activities online than in the traditional one since teachers are considering the fact that not all students have good internet connectivity. It is also noted from the result that both groups of students experience stress and problems with the present modality of learning. This means that higher year level in the university does not guarantee lighter experiences or lesser stress in undergoing distance learning.

Some of the indicators have opposite responses from the students when grouped according to year level. As to the 2nd year students, they claimed that they study more efficiently in distance learning of which the first year students have disagreed with. Also, they find communication with their teachers and classmates is easier with distance learning but the first-year students find it more difficult. First year students are shyer to approach their teachers and classmates online that the sophomores.
Contrary to the result of the study of Lisa R. Amir, et al in 2020, the freshmen are more pessimistic towards distance learning as proven with their disagreement with the statement that distance learning gives them higher learning satisfaction than classroom learning.

Table 5. The result of the T-test which was used to determine if there is a significant difference on the student's perspectives on the learning modalities during the Covid-19 pandemic when grouped according to year level.

	Year Level	N	Mean	Std. Deviation	p-value
Perspectives	1st Year	75	2.4905	.28362	.004
	2nd Year	20	2.6964	.26308	

Since the p value of .004 is lesser than that of the alpha (.05), the null hypothesis which states that there is no significant difference on the perspectives of KSU students on the new normal learning modalities when grouped according to year level is rejected. Hence, there is a significant difference on the perspectives of KSU students about the learning modalities amid the Covid-19 pandemic when grouped according to year level.

In the study of R. Kalman and her group in 2020, many students in upper-level chemistry courses taken by higher year level have been able to cultivate adaptability skills, organizational skills, and self-awareness that makes a student a successful online learner and further fully developed passion for the subjects they are learning which will make them successful in taking classes online, even with increasing difficulty of the subject matter.

Table 6. Stress coping mechanisms of the students enrolled in subjects with calculations amid Covid-19 pandemic when grouped according to sex.

Statements	**Male (%)**			**Female (%)**		
	A	**S**	**N**	**A**	**S**	**N**
I cry and talk to my friends.	0	59	41	9	72	19
I oversleep and overeat.	12	73	15	9	59	31
I try to find the meaning of life through movies and games.	20	63	17	10	74	17
I try to pull myself out of the hole.	27	54	19	24	70	6
I want to stay alone.	22	56	22	24	65	11
I seek advice from people who have faced similar situations in the past.	34	59	7	26	63	11
I try to distract myself by doing other things.	41	49	10	46	50	4

I accept help from others.	59	39	2	63	37	0
I try to solve one problem at a time.	49	51	0	28	72	0
I brainstorm all possible ways of managing the stress.	32	63	5	28	70	2
During stressful times, I focus on trying to understand what happened.	61	37	2	48	52	0
I always try to look at the brighter side of things.	61	37	0	59	39	2
When dealing with a problem, I try to step back and look at it from a broader perspective.	39	51	10	26	72	2
I explore all options before solving a problem.	49	49	2	33	67	0
I try to look beyond the temporary struggles.	32	63	5	24	76	0
I am ready to make compromises to avoid stress.	37	61	2	43	57	0
I often wait for problems to take care of themselves.	12	61	27	4	54	42
I use reading, meditation, exercise, and other hobbies to overcome a difficult situation.	46	51	3	46	50	4
I think about myself and my family before taking any action.	61	37	2	72	23	0

Coping mechanisms with the highest rate in this study were thinking about themselves and their family before taking any action and accepting help from others based on the study.

The findings indicate that both male and female students opt to think about themself and their families before taking any action as their coping strategy. This is due to the fact that they are studying at the comfort of their home and can easily address their difficulties. Both male (59%) and female (63%) respondents always seek for help from others which is a positive coping strategy in line with the study of Gore et al. in 2014 which include seeking support and using leisure activities.

Differences in coping mechanisms were mentioned between males and females. This showed that females use social support, positive reframing and aid seeking behavior as a coping strategy while males react to negatively by picking either dynamic adapting methodologies or avoidant procedures, for example, liquor or medication use (Aldwin, 2007; Dyson & Renk, 2006, Desmarias & Alksnis, 2005). Coincidentally, some studies have found no gender differences in the coping strategies used by men and women to deal with stressful situations. (Donaldson, Prinstein, Danorsky, & Spirits, 2000). In addition, Thoits (1995) reported that, while gender is thought to influence the association between anxiety and the category of coping stratagems chosen, the findings can be inconsistent at times.

Table 7. The result of the T-test conducted to determine if there is significant difference in the coping mechanisms of students when group according to sex

	Sex	N	Mean	Std. Deviation	P-value
Coping Mechanism	Male	41	2.2632	.26604	0.754
	Female	54	2.2485	.18808	

Since the p value of .754 is greater than that of the alpha (.05), the null hypothesis which states that there is significant difference on the strategies of KSU students in coping with stress while enrolled in subjects with calculations when grouped according to sex is accepted. It means that the coping mechanisms by both male and female respondents are statistically the same.

Stress could potentially cause burnout, and currently students engaged in e-learning are experiencing (Fawaz, M., & Samaha, A. in 2021). The present study coincides with the study of R.Palupi and A. Findyartini in 2019 which showed that there was no significant relationship between gender and burnout among 167 first-year respondents.

Table 8. Stress coping mechanisms of the students enrolled in subjects with calculations amid Covid-19 pandemic when grouped according to year level.

Statements	1st Year (%)			2nd Year (%)		
	A	S	N	A	S	N
I cry and talk to my friends.	4	65	31	10	70	20
I oversleep and overeat.	8	69	23	20	50	30
I try to find the meaning of life through movies and games.	13	71	16	15	65	20
I try to pull myself out of the hole.	24	65	11	25	60	15
I want to stay alone.	23	60	17	25	65	10
I seek advice from people who have faced similar situations in the past.	27	64	9	40	50	10
I try to distract myself by doing other things.	48	45	7	30	65	5
I accept help from others.	57	41	2	75	25	0
I try to solve one problem at a time.	35	65	0	45	55	0
I brainstorm all possible ways of managing the stress.	31	65	4	25	75	0
During stressful times, I focus on trying to understand what happened.	49	49	2	70	30	0
I always try to look at the brighter side of things.	57	42	0	70	25	5
When dealing with a problem, I try to step back and look at it from a broader perspective.	33	63	4	25	65	10
I explore all options before solving a problem.	38	60	2	45	55	0
I try to look beyond the temporary struggles.	21	76	3	50	50	0
I am ready to make compromises to avoid stress.	36	63	1	55	45	0
I often wait for problems to take care of themselves.	5	59	36	15	50	35
I use reading, meditation, exercise, and other hobbies to overcome a difficult situation.	48	48	4	40	60	0
I think about myself and my family before taking any action.	67	32	1	70	30	0

Results of the study convey that across the year levels who took up courses with calculations, their coping strategies includes thinking about themselves and their family before taking any action and accepting help from others. Greater percentage of Second-year level (70%) showed that they always used the above-mentioned strategies whenever difficulties arise through their educational journey. The researchers speculated that these students already adjusted to the present situation in our education. Since higher year level had a year-long acquaintance with his/her classmates during the previous year, they can easily reach out to their classmates for help. Experiences from the researchers being the subject-in-charge of the subjects with calculations, aside from the Group chat (GC) of which the students were added, a separate GC was made in the absence of the teachers where they can easily ask queries related to their subject and sometimes the activity they are struggling to finish.

According to the literature, coping techniques are vital, with their context expressed by social support, notably within the family, and emotional, with medical students' passions being the most important aspect in the fight against stress. As in any difficult situation, each person relies on different coping techniques. It is usually difficult for medical students to deal when they are unprepared.

Table 9. Result of the T-test conducted to determine if there is significant difference in the coping mechanisms of students when group according to year level.

	Year Level	N	Mean	Std. Deviation	P-value
Coping	1st Year	75	2.2400	.21252	0.212
Mechanism	2nd Year	20	2.3105	.26060	

Since the p value of .212 is greater than the alpha (.05), the null hypothesis which states that there is significant difference on the strategies of KSU students in coping with stress while enrolled in subjects with calculations when grouped according to year level is accepted. Hence, different stress coping mechanisms from the different year levels.

The present study is in contrary of the study of S.A. Kalra, G., & Pakhare, A. in 2013 that age, year of nursing education and family background did not affect stress or coping styles of the nursing students in Indian student nurses.

Conclusion and Recommendations

The CoVid – 19 pandemic had brought different changes in various sectors of life. The education sector is one of the most challenged sectors in this health crisis. To prevent the further spread of the virus, schools transitioned from classroom learning into distance education approach. However, this study revealed that students are not for distance education and disagreed that they have higher learning satisfaction since the implementation of the said approach. When grouped according to sex, there was no significant difference on the perspectives of the students when grouped according to sex. Though the coronavirus disease is still posing a high risk to our health, students are looking forward to the implementation of the blended learning (combination of classroom and distance learning) next semester. An opposite result was noted when they are grouped according to year level.

The commonly used coping strategies amongst our responded students were thinking about themselves and their family before taking any action, accepting help from others while studying throughout this pandemic and being optimistic with the current situation. It was reported that the year level had posed significant difference in responses of the students as to their strategies towards stress and that results shown that the coping mechanisms by both male and female respondents are statistically the same.
Teachers and classroom staff are on the front lines of assisting students in seeking appropriate therapy and receiving an education in a secure and comfortable setting. When school staff and teachers are adequately prepared, they can successfully manage anxiety and depression in their students and create a better learning environment, resulting in superior academic outcomes.

From the findings of the study, it is recommended that the university may consider adopting blended learning for a more flexible approach of delivery of instruction to address concerns like poor internet connectivity, lack of gadgets, and the like. Students may consider taking initiative in looking for other resources that may support their studies. The University may sustain its program on Mental Health Awareness and may consider conducting webinar about mental health and stress management among students and teachers at least twice a semester. Group activities that would help them gain friends and trust is imperative to be integrated in our student's virtual classroom activities so students may develop other stress coping strategies aside from what they usually do such as confiding to a friend or a classmate. This will bring internal transformation and increase in the overall well-being of the students.

Acknowledgement

This study was made possible with the support of fellow mentors who have sent the instrument to their students. It would not be successful without the active participation of the tertiary students from various colleges in the university by answering the given instrument. Also, the researchers are grateful to the research council of the College of Criminal Justice Education for the recommendation and to the University Research Council for the approval of the study. The researchers are always motivated to work at their best because of the families, colleagues, and above all, because of the inspiration given by the Almighty God.

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Og-Ogbo: An Indigenous Sense of Community in Lagawa Bauko Mountain Province

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Abstract - This qualitative-descriptive research anchored on the Functionalist sociological theory was conducted in Lagawa, Bauko Mountain Province. It described the practice of "Og-ogbo" among the different social categories of people. Key-informant interviews and Focus Group Discussion were used. The study revealed that the locals practice og-ogbo in their agricultural activities, house construction, special occasions, community events, in case of death, calamities, and when needs arise. Interestingly, the different social categories of people practice og-ogbo differently, the Anap-o practice og-ogbo through Agag", mankidap or mangebngeb, share bountiful harvest to the community through "Bayas", practice of Pakde and Ngilin, while the amam-a /inin-a practice og-ogbo in various agricultural activities, rendition of service during house construction, caterer for the celebrants during special occasions, sharing of crops to the community, ou/uu in case of death, and donating to the victims during calamities. The mumuyang practice og-ogbo through the rendition of services during events and collecting the ou. The babaros and babalasang practice og-ogbo through their minimal participation in the activities of the older members, and voluntarily helping their neighbors in various activities. Interestingly, one of the enduring issues seen to challenge the og-ogbo is the introduction of money and modernization of society. Above all, og-obo as a sense of community unites the community, and it is positively viewed as a duty and a responsibility rather than a burden through their community concept of "urnos di mangili".

Keywords - Sense of Community; Indigenous Knowledge, Functionalist; Bayanihan; cooperative work

Introduction

The Philippine society comprises local networks or small groups characterized by a sense of belonging, intimacy, and affection, and a strong sense of family and community. Among these local networks is a distinctive practice that demonstrates togetherness and we-ness for a purpose. This practice is the widely-known concept— Bayanihan. The Bayanihan practice shows the community spirit of unity, oneness, participation, strong involvement (Espina, 2014), and cooperation that leads to the reaching or achievement of a particular objective (Bayanihan Foundation Worldwide, 2011). Bayanihan makes seemingly impossible tasks possible through the concerted effort of many people working together on a common goal (Sarmenta, 1998). It further demonstrates teamwork, an act of kindness, humanity and an outpouring of community spirit-as people give their all to the common good, without expecting recognition or personal gain (Abundo 2015).

Different ethnolinguistic groups have their own term for Bayanihan. The Waray speaking people of Leyte and Samar call it "tiklos", "pintakasi," or "alayon". The Ivatan of Batanes call it "paysidu-sidungan", the Ilokano call it "ammoyo" or "tagnawa", and other Tagalog people also call it "bataris" or "bataresan". The Palawano, on the other hand, calls it "tabang-tabang", other Visayan speaking people call it "tambayayong" the Maranaw call it "kapamagawida" or "kapamagogopa" and the Subanen call it "dundyug" or "sod" (Arpon, 2006).

The ethnolinguistic groups in the Cordillera Administrative Region similarly have their own practices that mirror their sense of community. The Kankanaeys of Benguet have the Aduyon, Kamal, or Alluyon, a cooperative work or mutual labor exchange to save on time, which is very important in cash crop farming communities (Benguet State University, 2018). In the case of Amtuagan, Abra, the community practice the Alluyon, where men help in the building of new houses by voluntarily carrying timber from the mountains to the construction area. Though these are voluntary, the owner of the house must prepare lunch for the workers (Galang, Palaganas, Sinumlag & Suyam, 2013). In Ifugao Province, through the Baddang or

Badchang, a farmer gets assisted in performing farm chores or house repairs. Baddang or Badchang makes the construction of the rice terraces possible (Casiraya, 2012).

Though different terms are used to refer to these practices, the meaning remains to be that of voluntary, reciprocal, and communal work. However, in the long intermittent periods of quiescence followed by sudden bursts of activity, the notion of this ancient tradition and societal state coordinates changed (Chaudhuri, Sopher, and Strand, 2002). There is the disintegration of this traditional reciprocal labor exchange because people began to adopt the cash economy. As a result, the community members no longer depend on other members to help them in their work; instead, they hire them in exchange for a wage (Abanilla, Abiera, Bautista, & Matillano, 2017).

With the changes in the environment, some of the rural areas adapted to the urban jungle way of life; however, despite these changes, there still are some communities that observe and practice their sense of community through cooperation and mutual help. One particular ethnolinguistic group that still adheres cooperation and mutual help to show their sense of community are the Kankanaeys of Lagawa, Bauko, Mountain Province.

Anchored on two sociological theories, the Functionalist Theory and Symbolic Interactionism, this study on the sense of community in Lagawa, Bauko, Mountain Province was conducted. The Functionalist Theory, as sociological theory, sees the society as composed of different but interdependent integral parts with different functions, and these parts play a vital role in keeping the society intact and functioning. A defect in one part's function could affect the output of the entire society. Hence, communities always operate on equilibrium where the social, cultural, political, and economic structures of the community produce order, stability, and productivity (Abenir, Alipao & Urgel, 2017). Affixing this theory of functionalism in the cultural practice of the locals of Lagawa, it could be gleaned that the locals practice og-ogbo to maintain the stability of their community. The locals see themselves as important actors in maintaining the social order of the community.

Another sociological theory is Symbolic Interactionism, which focuses on the different meanings individuals attach to objects, peoples, and interactions as well as the corresponding behaviors that reflect those meanings and or interpretations. Through their interactions, people are able to construct and alter existing social, cultural, political, and economic structures (Kendall, 2008). In the Og-ogbo practice of Lagawa, the locals were able to construct its shared meaning—that of a sense of community that shows oneness, belongingness, and unity among the people in community and persons who do not participate in such practice are labeled as deviant (a person who does not conform to the cultural norms of their community).

This study aims to describe the practice of Og-ogbo as a sense of community in Lagawa, one of the barangays in Bauko Mountain Province. This study further trace the concerted efforts of the locals of Lagawa, Bauko, to preserve their Filipino sense of community through Og-ogbo practices despite socio-cultural change and globalization that may have affected the local culture. It is hoped that through this study, the researcher will achieve her purpose of promoting the continued practice of the old-aged Og-ogbo, despite modernization and economic progress that seem to distort this collaborative practice.

This study describes the Og-ogbo activities in Lagawa, Bauko Mountain Province, as practiced by the different social categories of people in the community. Specifically, the following specific problems were answered: 1) In what situation is Og-ogbo practiced by each of the social categories of people as the a) Anap-o, b) Amam-a/Inin-a, c) Balasang/babaros, and the d) Agtutubo Mumuyang; 2) What is the perception of the) Anap-o, b) Amam-a/Inin-a, c) Agtutubo or balasang/babaros, and the d) Agtutubo or Mumuyang towards Og-ogbo?

Methodology

This study used a qualitative-descriptive method to present the picture of how the locals practice the og-ogbo in Barangay Lagawa, and how the locals perceive ob-ogbo as a communal practice. The study is set in Lagawa since the og-ogbo is their sense of community is still being practiced in different situations, despite globalization and modernization.

The researcher used a Key-informant interview supported by a Focused Group Discussion and observation. The Key-informant interview composed of eight (8) participants, while the focused group discussion composed of thirty-two (32) participants composed of eight (8) representatives per social categories based on how the locals classify themselves. These are the Anap-o, Amam-a/Inin-a, Agtutubo (Babaros/Babalasang), and Agtutubo (Mumuyang). The anap-o are the community elders considered to be the grandfather or grandmother of the locals, the amam-a/inin-a referring to the married individuals and can be regarded as the father or mother of the young people, the agtutubo composing of the Babaros and Babalasang who are at least 14 years old and above, and the Mumuyang who are below 14. The participants were identified by the community leaders who are believed to be knowledgeable with regard to the customs and practices of the place.

The categories of the locals include the a) “anap-o” (ipogaw ed nabaon or people before)—the elders of the community and seen to be the father/mother of the community, the second lawyer of the community hence their advice or suggestions for the community matters; b) the “inin-a and amam-a”, the inin-a’s/amam-a’s are the married individuals, next in rank to the Anap-o. They serve as a father and mother of the youth in the community; c) the Babalasang and babaros” composed of teen-agers or single individuals who reached their majority age. They are the youth of the community who are in charge usually of running or organizing community affairs or special occasions and serves as assistants to the older member; d) “agtutubo ay muyang or aneng-a or enga”, the children of the community composed of the younger generations in the community.

Guided by the “The Indigenous Knowledge Systems and Practices (IKSPs) and Customary Laws (CLs) Research and Documentation Guidelines of 2012, the researcher obtained the approval from the NCIP to conduct the study. Following the said approval from the NCIP, the researcher proceeded to the Barangay of Lagawa to inform and explain to the Barangay the nature of the study. The researcher then showed the notice of approval from the NCIP to the community leader and gave the community leader the separate letter of approval through the Free and prior informed consent (FPIC). The researcher then asked for assistance from the Barangay leaders in the identification of the participants in the study. After the gathering of the data and the interpretation, the researcher went back to the community to validate the results of the research. After the validation of the data, the researcher already finalized the output.

Results and Discussions

This section presents a description of how the different categories of people practice the og-ogbo. The information gathered from the locals who shared their stories and experiences, being a member of the community participating in the og-ogbo, provided the details necessary to answer the concerns of this study.

The roles and functions of the different categories of people support the Functionalist Theory as a sociological theory that sees the society as composed of different interdependent integral parts with different functions, and these parts play a vital role in keeping the society intact and functioning. The communities, therefore, always operate on equilibrium where the social, cultural, political, and economic structures of the community produce order, stability, and productivity (Abenir, Alipao & Urgel, 2017). Affixing this theory of functionalism in the cultural practice of the locals of Lagawa, the researcher surfaced that the locals practice og-ogbo to maintain the stability of their community where there is oneness of people. Further, the locals see themselves as an important factor in maintaining the social order of the community by recognizing their social obligation of helping one another in any kind of community affairs, and events or experiences.

Situations where the people practice og-ogbo

The locals’ practice og-ogbo in various situations, such as agricultural activities, house construction, community events, calamities, special occasions, and in case of death. However, the practice of og-ogbo varies because of the historical development of the said practice and the role attached to different categories of people.

Ways by which the Anap-o practice og-ogbo

From the responses, four sub-themes surfaced as a way of how the anap-o practices og-ogbo. These sub-themes include: “Agag” in agricultural activities, mankidap or mangebngeb during house construction, sharing bountiful harvest to the community through “Bayas”, practicing Pakde and Ngilin in case of death.

“Agag” in agricultural activities

The stories of the Anap-os reveal that people in the olden times, only the rich ones are capable of owning farmland who then offered the cultivation of fields to the less privileged members of the community who got compensated by rice crops or money. Og-ogbo during the time of the anap-o can only be seen in “komboy” (carrying of crops from farm to market road through “gimata”) as one of the anap-os agricultural activities, and in their agricultural activities in their rice fields.

The locals narrate that og-ogbo is being initiated in the agricultural activities of the locals. First, the one who needs help will initiate the “Agag” (to invite a neighbor) with the locals who want to do og-ogbo with him/her, then the parties will agree on the number of days they would be helping each other. When labor is already rendered to the initiator, he will also render labor to the participator. After such labor is compensated, the og-ogbo agreement is already completed and will be extinguished.

Mankidap or Mangebngeb during a house construction

In house construction, the Anap-o help each other in making their “inatep/kulkulob” (Cogon House). When one member of the community, particularly a newly-wed plans to construct his/her own house, the plan is announced to the locals. Every member of the household then contributes to the newlywed one bundle of cogon for building their house. The male members are in charge of constructing the cogon house. Such labor is not be compensated, but when another member has a plan of constructing his house, everyone also helps the person.

The locals also practice “ou”—donations by collecting salmons of rice crops from different households. The rice will be cooked as a food of those who helped in house construction.

Mankidap or Mangebngeb, as an og-ogbo by the Anap-os, shows the Filipino culture of Bayanihan (“being a community” in Filipino). This practice, which manifests the value of collective work and action buoyed by the spirit of communal unity and cooperation, is alive through the Og-ogbo practice of the locals of Lagawa.

Sharing of a bountiful harvest to the community through “Bayas”

Celebration in the community is initiated by one member who has a bountiful harvest or has a lot of animals to be butchered or by a simple celebration to show love to the community. This practice is called bayah/bayas. In the bayah, the initiator butchers a pig and offers it to the community. The bayah, which takes two days or more depending on the initiator, is followed by the “Binaa”. Bina-a is a practice of selecting one pair, a boy and a girl who will be the helper of the initiator during the entire process of “bayas”. This involves “Bayo”—pounding of rice crops for the “bayas”. During the “bayas”, the community hopes that the chosen pair will eventually fall in love with each other and get married.

Practicing “Pakde” and “Ngilin” in case of death.

The community also practices the “Pakde” and “Ngilin” in case of death in the community. Every member of the community has the role here as part of their og-ogbo. If someone died in the community, the locals must not work in their fields, especially if these are near the source of water. This practice is called “ngilin”. During the Ngilin, someone from the community is asked to block the water source from their farms, preventing the flow of the water because it is believed that if the water is allowed to flow, the farm will erode. This practice of blocking the water source is called “Pakde’’. The Pakde lasts until the dead is buried.

Completing the unfinished “tuned” and “aney” of the bereaved family.

Og-ogbo is practiced during the tuned (planting rice) or aney (harvesting palay) when the family of a dead member of the community is not yet done with the farm works. The members of the community finish the farm works for free since it constitutes the og-ogbo in cases of “rigat” experienced by the member. In this case, the locals go and finish the farm work, and such is an exemption to the prohibition of people going to their rice field to work.

Aside from completing the unfinished agricultural activities in the rice field, the locals also practice ou where each household is expected to contribute one cup or one salmon of rice. In addition, they may also give firewoods, which will serve as their “supon”—abuloy.

The above ways by which the anap-o practice og-ogbo shows that the people have other mechanisms to help those in need despite the absence of money.

Sukyab during Calamities

The community also extends help during calamities, particularly typhoons. When a house gets destroyed, the community help by providing temporary shelter to the victims, or by repairing the destroyed portion of a victim’s house. This practice is called “Sukyab”. This sukyab refers to changing the roof of the cogon house or reconstructing the entire house. The people will donate materials to re-build the house, and the men will rebuild the house voluntarily. This practice was backed up by the claim of Srivastava, (2010) that the impact of disaster mirrors the everyday condition of the affected society. The ability of ethnic groups to face natural hazards reflects their position within the larger society.

The Anap-o’s og-ogbo was seen centuries ago where Filipinos lived in separate settlements and small kingdoms. During the planting or cropping season, the Filipinos will all come together as one community to help harvest the rice. This tradition is the bayanihan, from the Tagalog words bayan (community) and anihan (harvest) (Alin, Bahron, Eranza & Razili, 2015). As a part of social behavior, individuals are always directly or indirectly expected to share moral, material, and non-material help and resources to their society’s well-being (Maguigad, Malupay & Singson, 2007). The act of sharing to fellowmen and giving refuge to those persons who are persecuted is always an expectation from each member of the society.

Ways by which the Ama-a and Inin-a

The discussions that follow present the different og-ogbo activities of the Amam-a and Inin-a in different situations.

Helping each other in various agricultural activities

Og-ogbo in agricultural activities was practiced by the Anap-o, and the Inin-a/Amam-a, but while he Anap-o practiced og-ogbo in rice field activities and in"komboy", the Inin-a/Amam-a introduced og-ogbo in all agricultural and gardening activities, not only komboy, which involves money in the time of the Inin-a/Amam-a.

The Amam-a and/or Inin-a maintained that og-ogbo in agricultural activities involves rendering labor until their "temam"—work started—is completed. The number of days needed to complete the work will be the same number of days rendered to each of those who rendered work.

The agricultural activities where the owner may ask help from the locals include: Gabyong (cultivating the land), Mula (Planting of crops), Lugam (removing the wild grass off the farm or the plants) and apit (Harvesting). This og-ogbo practice demands the sameness of the work requested, to the work to be rendered to the parties. Furthermore, if the work gets stopped because of bad weather, the parties commit to finish all the temam the moment the weather becomes good. In harvesting of crops, the og-ogbo of the locals include helping the owner harvest his crops and bringing ("Komboy") these crops from farm to market road. In this Komboy, those who participated were financially compensated based on the total weight (in kilos) of what they have carried. However, if the price of the crops is down in the market, all services rendered constitute og-ogbo.

Community Organization

To strengthen the og-ogbo, the farmers formed the Farmers Organization which aims to promote mutual help among the members. Like in komboy, every member of the organization is expected to help in bringing the crops from farm to the market road. The non-members may decide to help without expecting any compensation, especially if the price is not good. A certain donation at the will of the owner of the crops will also be given to the organization. The donation is used for the benefit of the locals.

Interestingly the above situation contradicts the claim of Maquiso (1997) that the progress and development has diminished the cultural traditions and beliefs of the farmers. In the case of the locals of Lagawa, the community unites to still practice og-ogbo.

The Og-ogbo of the Amam-a and Inin-a in their agricultural activities concur with the claim of Malamba (2014) that community participation in the farm is perceived not in a systemic but in a social way. The whole community engages in community work which leads to the completion of what needed to be done.

Rendition of service during house construction

At present where the houses are already made concrete, people have divested the old practice of og-ogbo in house construction. If lumber needs to be carried, the amam-a and the babaros help transport these from the forest to the construction site. The services are not compensated, but the recipient of the rendered service offers snacks or drink.

Og-ogbo in house construction is practiced only for those owners who cannot afford to hire the services of a carpenter or mason. If the community perceives that the owner can afford to hire the labor of the carpenter or the mason, no og-ogbo is practiced for him.

Caterer for the celebrants during special occasions

During special occasions as described by the Amam-a and Inin-a, og-ogbo is practiced. Every member volunteers and contributes in any manner possible, like rendition of labor or donating money, vegetable or firewood for the food preparation.

Wedding celebration is one of the special occasions where the community works together. During weddings, it is implied that everybody is invited to attend. The family of the couple will usually ask someone to announce and invite the community to the celebration or they will just inform the Anap-o or Amam-a/inin-a about the wedding and it will be their obligation to inform their family members to attend the ceremony and most especially to help in the preparation of food. Apart from the preparation of food, each household is also expected to invite the guests to their homes, thus lightening the burden of the newlyweds.

Awil

The Amam-a and Inin-a also added that they practice awil. Awil pertains to the practice of giving pagey—rice crops or money to the first born child of the newlywed couple as a way of welcoming the child to the community.

The ways by which the amam-a and inin-a practice og-ogbo in special occasion especially weddings concur with the presentation of Palispis (2007) about the social group seen as a structure of relationship that springs from the individuals' collective enactment of their respective roles and statuses. The og-ogbo practices in special occasions show how every member of the family participates in the events and activities initiated by the any member of the community (Hay, Fingerman & Lefkowitz (2008).). This proves that the family as the bedrock of a community has the mission of searching for the common good through participation in community concerns (Villegas, 1998).

Sharing of crops to the community during Barangay/Community events

Fiestas are celebrated by the people as part of their community affairs. In Lagawa, this is done to celebrate their blessings through the "Pesing" festival. In this event the locals share their crops like beans, carrots, cabbage, pechay, and any farm produce. They also contribute some amount to buy rice or some animals for the celebration, or contribute in the form of labor, or money for the prizes, or for food or for community fund.

Sharing of crops during community events agrees to the claim of Palispis (2007) that fiesta functions to renew community and kinship ties, to reinforce status and prestige, to bolster existing authority and renew the system of reciprocal obligations.

Ou in case of Death

Unlike in the time of the Anap-o where ou--donation is done in case of death, house construction, or celebration, ou as practiced by the amam-a is done only in case of death in the community. Such donation is in a form of a salmon of rice, or more at the will of the donor. The donor may also choose to give cash. The cash collected from, or given by those who attend the wake is spent for food during the wake to the burial. Community members also render services such as cooking, serving, attending to visitors in the house of bereaved family. Others offer their vehicles for transportation for whatever purpose related to the needs of the bereaved family.

Completing the unfinished agricultural activities in the rice field of the dead or the bereaved family.

The practice of the Anap-o completing the unfinished agricultural activities in the rice field of the dead or the bereaved family is still practiced by the Ama-a and Inin-a. The practice of og-ogbo in case a member dies in Lagawa is corroborated by the presentation of Costales, Javier, & Rivas (2002) where the ramay or damayan inherent in the Filipino culture is evident up to this time. This shows that despite the diversities of culture within the Philippines there are still a common culture that is present within communities.

Donation to the victim During Calamities

When the community experience calamities, the locals also extend help to the victims. Though the destruction may not be as pronounced as in the days of old, the Amam-a and Inin-a acknowledged that og-ogbo is still practiced as needed. As concurred by the FGD Inin-a 2, the locals may do what the people in the olden times do, like offering shelter to the victims, giving clothes, offering food or shelter to them. In case of fire, the locals also donate anything beneficial to the victim.

Ways by which the Babaros and Babalasang practice Og-ogbo

The discussions that follow present the different og-ogbo activities of the babaros and babalasangs.

Participating in the og-ogbo initiated by the older members.

Lagawa's young people's actual involvement varies. They can be tapped by the Anap-o or Amam-a/Inin-a to assist them in any activity/activities. They can participate in the og-ogbo of the Anap-o and Amam-a/Inin-a except for tong-tongan which is only for the Anap-o and Ama-a/Inin-a.

In the agricultural activities the babaros/babalasang participate in all of the og-ogbo like tuned, daos—removing weeds from the stonewalls on ricefiels, aney , gabyong, mula, lugam, apit, and komboy, especially that the babaros are members of the association who must participate in the komboy.

Offering services to those who are in need.

According to the babalasang seldom are the cases where the role of the babalasang exists because house constructions are for the men in the community unless they will be asked to cook for the workers. Moreover, as narrated, the babaros participate in the og-ogbo of carrying house construction materials. The og-ogbo is not as strong as in the past because most of the people nowadays can afford to hire laborers.

Rendition of services in different events

In different events in the community the babaros through the request of the community are in charge of inviting to, or informing the locals of community, or family events like birthdays, house blessing, thanks giving, dedication, or death of a member. In all of these events, the babaros and babalasang work together in the food preparation and cooking, washing the dishes and cleaning the area used.

Collector for "ou"

The Babaros and Babalasang are always expected by the community to come out during community events most specially during dejection to help the bereaved family. This is because according to the Anap-os and Amam-a/Inin-a they still do not have a family of their own and they have less obligations.

In case of death, the "babaros" are in charge of collecting Ou through the request of the community, and the "babalasangs" assist the "babaros" in serving coffee and cooking food.

Ways by which the Mumuyang practice Og-ogbo in their agricultural activities

The discussions that follow present the different Og-ogbo activities of the mumuyang in different situations.

Minimal participation in the activities of the older members

The participation of the mumuyang in agricultural activities depends on their ability. The minimal participation of the mumuyang extends to carrying the baon of the workers, collecting the uprooted wild grasses and piling these for burning as fertilizers.

The mumuyang boys may also participate in the komboy but limited only to what they can carry. In the komboy, the mumuyang are given money as compensation. The mumuyang's participation in the og-ogbo activities for the dead is limited since they are prohibited to attend the wake. Some however can help in serving coffee or distributing candies.

Voluntarily helping their playmates/young neighbors in various activities

The Mumuyang/Aneng-a in the community also have a unique og-ogbo with their playmates or neighbors. They help each other in their daily activities, school activities, and chores assigned like pounding of rice crops, and helping each other in school assignment.

Saringit for the mumuyangs.

Saringit is an activity of harvesting the remains of the gathered crops. The mumuyang practice og-ogbo by going to the different gardens to gather some rejected crops or the saringit—the bud that grows from the stem of harvested plants, or that which remains from gathered plants— of the plants. Such practice is done after school hours or school days, and it is a practice seen more of building the camaraderie of the young, than exacting labor from them.

Perception of the locals towards their Og-ogbo practices

The four themes that surfaced from the narratives of the participants as to how the locals perceive their og-ogbo practices are presented in this section.

Perception of the Anap-o towards their Og-ogbo practice

All of the Anap-o perceived their og-ogbo practice to be beneficial, though there some aspects they believe need to be modified. Og-ogbo is beneficial and practical because it is done to help every member of the community without using money. Also, the Anap-o view og-ogbo as a tool that unites people in the community and thus creates a sense of community. Mangeb-ngeb or mankidap as an og-ogbo of the

Anap-o is no longer practical that is why it is already fading. This used to be beneficial to people until such time that money was already introduced to compensate for the services or labor rendered by people.

Og-ogbo is seen as still important amidst the changes that transformed how people think and behave. For them, the main essence of the og-ogbo is helping each other in any activities. This then should be preserved to strengthen the camaraderie of the locals and to make the people realize the importance of volunteerism when a need arises.

Way to help and uplift fellow compatriot

The Anap-os are very thankful of the presence of og-ogbo especially in case of death. Collectively, they see og-ogbo very helpful because the bereaved family need not worry about work, materials to be used during the funeral, or food for the people attending the wake and burial. The og-ogbo practice helps the bereaved family financially, and emotionally.

Og-ogbo also means bayanihan—local civil efforts, regular Filipinos working together to uplift their fellow compatriots (Florano, 2014), teamwork, an act of kindness, humanity and an outpouring of community spirit-as people give their all to the common good, without expecting recognition or personal gain (Abundo 2015). Balancing the benefits of integrating into a globalized world against protecting the uniqueness of local culture requires a careful approach. Placing culture at the heart of development policies does not mean to confine and fix it in a conservative way, but on the contrary to invest in the potential of local resources, knowledge, skills and materials to foster creativity and sustainable progress.

Perception of the Amam-a/Inin- towards their Og-ogbo practices

The Amam-a and Inin-a perceived the og-ogbo as practical and beneficial. As such, this need to be enhanced in the community because og-ogbo shows unity among the community members and it sets as a good example for the coming generations. With the introduction of new ideas in the community, still the people preserved the essence of og-ogbo to further strengthen the unity among the people.

Replacement for money

The Amam-a/Inin-a perceived the practice favorable at present because of the increase of minimum wage in the community. The people practice og-ogbo rather than go for monetary labor. They see the increase of minimum wage as a burden on their part.

According to the Amam-a and Inin-a, in the agricultural activities of the people nowadays the people prefer og-ogbo because there is already an assurance that someone can be tapped in case of need in agricultural activities.

In house construction, og-ogbo is seen not practical though beneficial in special cases. At present, house construction requires days and months to finish the labor especially that houses nowadays are of concrete or non-light materials, unlike in the olden times.

Shows unity and hospitality

Og-ogbo during special occasions was perceived by the amam-a/inin-as very helpful especially to the host since people are readily available to help in all matters related to the event. It shows the unity because a celebration by a host, like wedding, is a celebration of the whole community.

Awil is seen as an important practice because it is a way of welcoming the first-born child of the newly wedded couple and the gifts that they will receive from the community symbolizes blessings and healthy life for the child.

The ways by which the amam-a and inin-a practice og-ogbo during special occasions further affirms that the family being the bedrock of a community has the mission promoting the common good through participating in any occasion and events that is being initiated by the member of the community.

Shows interconnectedness of the community.

In Barangay fiestas, og-ogbo practice of all the locals (coming from different sitios) shows the unity of the community. The og-ogbo in community events as affirmed by the amam-a/inin-a shows the interconnectedness of the locals extending to other community, as community members get to connect with others from a different community.

The above perception of the amam-a and inin-a is consistent with Villegas (2014) who stated that the cultural orientation of people does not exclude outsiders from being part of a community such as exemplified by the concept of saling-pusa (informal member). Connecting this with the perception of the amam-a and inin-a, it can be inferred that they see non-members as part of their community. Hence they should be treated with utmost hospitality by the practice of Og-ogbo

Ou as the greatest legacy of their ancestors

The ou as an og-ogbo practice is seen by the ama-a and inin-a as one of the greatest legacies taught by the Anap-o to the community. This og-ogbo practice is favorable to the people because once one experience a loss of a family member he/she does not need to ask help from the people because the community will automatically initiate og-ogbo.

Og-ogbo is further perceived by the amam-a and inin-a practical and beneficial because it shows the unselfishness of the people in sharing whatever they have to help the victims of calamities.

The perception of the amam-a and inin-a towards their og-ogbo practice supports the claim of Andres (1988) that the Filipino community is predominantly rural, transitional, pluralistic, and developing but its aims, goals and aspirations are characterized by the values of Pakikisama.

Perception of the babaros and babalasang towards their Og-ogbo practices

The babalasang and babaros perceive og-ogbo as a bond in the community. However, it was perceived not practical in few instances.

As a result of their own childhood experiences, the babaros and babalasang perceived og-ogbo as a way of showing the unity among the people; however, two (2) participants see og-ogbo not practical at present because he sees the monetary compensation better in the context of a student working to have an allowance. The another one believes that og-ogbo is beneficial only when the participants all have farms or gardens; on the contrary, earning daily wage as a garden worker is to him better.

Participating in the activities of the older members is a help to the community.

The ways by which they practice og-ogbo was seen by the babalasang and babaro not only as a help to the community or to the bereaved family but a help to the older member because they have a lot of activities in a day from the family home to their job as a farmer.

Perception of the mumuyang towards their Og-ogbo practices

The mumuyang perceived og-ogbo beneficial and practical in the entire community. The mumuyang perceived og-ogbo as a solution to some problems that are being experienced by the locals in the community especially in finishing tasks. The mumuyang claim that og-ogbo solves the problem of individuals in dealing with work he cannot finish on his own.

Og-ogbo as an act of sharing.

The Mumuyang also see their og-ogbo as positive because this helps them finish the work assigned to them by their parents and they could still play with their neighbors after finishing their work together.

More so, sharing snacks that they have is also good because they will be able to share what they have and this is what their parents have told them, to share food to their classmates.

Above all, the og-ogbo tradition from the Anap-o down to the Mumuyang shows unity in the community, and exhibits a collectivist culture evident in the context. This corroborates the claim of Hofstede, Hofstede & Minkov (2010) on cultural differences which revealed that the Philippines is classified to belong to a group of countries with low individualism. Congruently, Baszynki, Ebenbach, Keltner, & Vasquez, (2010) argued that Filipinos can be classified as members of a collectivist society, where community considerations are essential. Clearly, for the locals of Lagawa Bauko in this study, their activities is facilitated through og-ogbo, one of the legacies of their ancestors that need to be preserved.
As cited by O'Loughlin (2017), the cooperation manifested by the people led to the establishment of societies. In ancient times, a member of a society does voluntary work as a sign of his oneness with the other members of the same. Man depends on the assistance of his fellow man whenever he has projects or things to be dealt with. This voluntary assistance that was later known as communal labor exchange became a tradition among societies. For the locals of Lagawa Bauko, the concept "ulnoh di mangili or himpangabong"(community unity or familial unity) is very important because this unites them, and promotes among them volunteerism, mutual help, camaraderie, and we-ness for a purpose.

Conclusion and Recommendations

The residents of Lagawa, Bauko clearly have a community built on mutual help, cooperation, and unity as evidenced by their adherence to the og-ogbo practices. Whether in agricultural activities, house construction, death, calamities, community events—both joyful and not, the locals in Lagawa need not worry much because of the benefits they enjoy from the og-ogbo tradition.
One of the many factors that encourage the people to hold on the said tradition is their unity as a community or their sense of community as the locals see each other as an important component of the community. As a result, everybody is expected to involve themselves with community events and/or affairs and non-participation of the said practice means disintegration to the community which tantamount to disturbing the unity of the community.

Another driving factor is their sense of ownership of the place. They identify themselves with the place that is why they are always willing to participate and cooperate. Communal work through og-ogbo was viewed as a duty and a responsibility rather than a burden. Most of all og-ogbo is a communal expression of the locals to serve the Almighty God by serving its people in the community.

Based on the findings of this research, the researcher recommends the following: 1.The Barangay officials should further enhance the og-ogbo practices and encourage more participation from the youth. They must always involve the youth in the community affairs so that they are informed of the importance of norms, and they will understand how norms work in the society. The Barangay officials may also come up with a program that will strengthen the og-ogbo practices through seminars of workshops; 2. The locals must be enlightened about the impacts of their og-ogbo practices in their lives and in keeping the unity of the community. This will inspire the other members to embrace og-ogbo in their community and further the interconnectedness of the people; 3. The educators should integrate in their classroom discussion the importance of og-ogbo, or its equivalent and in what situation and ways it is being practiced by the people. This will make them knowledgeable with the og-ogbo practice of their community so that the og-ogbo practices as one of the legacies introduced and passed by their ancestors will still be embraced in the lives of the people; and 4. For future researchers to study the rituals conducted by the people to extract the treasures, values and information behind these rituals. They may also look for the rural development practices of the people to further promote cooperative works in the community.

Acknowledgement

The researcher is very grateful to several people who contributed to the realization of the study: Her participants who unselfishly shared their experiences and life stories; Dr. Aida A. Dapiawen, her mentor, for her guidance, support and for generously sharing her wisdom and expertise; and relatives for providing her with unfailing support and continuous encouragement throughout her years of study and through the process of researching. Her profoundest gratitude is extended to them for they deserve all the recognition beyond measure, as deemed by this researcher.

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Keys and Locks: Unlocking the Anteroom of the Human Psyche in the "Doorkeeper" through Freudian Personality Theory

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Abstract - Literature as a mirror of life has always reflected the tenets of human nature. Like humans, the actions of the scribbled characters in Literature are influenced by their unconscious level of mind which is a repository of hidden truths and desires that yearn to be revealed. Hence, the researchers aimed to unlock the anteroom— unravel the unconscious of the seven (7) main characters in the graphic novel "Doorkeeper" by Scott and Ethan Chua. The researchers utilized the Freudian Personality, under the paradigm of Sigmund Freud's Psychoanalytic Theory, as the primary literary construct in the analyses. The researchers have dug deeper into the relationships among the Id, Ego, and Superego, and how the said personality elements clash during the characters' decision-making. The analyses revealed that the characters' decisions were maneuvered and motivated by either the selfish desires of the Id or the moral standards of the Superego. Furthermore, the study had drawn forth that every human is endowed with Free Will or the capacity to choose among alternatives, independently of restraints, regardless of social status, race, gender, and power. Free Will, however, is affected by the dominant personality element. The study offers a new perspective in analyzing the characters of any literary piece. It also accentuates the suitability of emerging literature, such as graphic novels, under the lens of literary criticism. The researchers recommend further studies of graphic novels and other emergent forms of literature using other approaches in order to expand the breadth of this work.

Keywords - Anteroom; Ego; Human psyche; Id; Superego

Introduction

If you are who you are, then who are you that makes you who you are? If you act how you act, then what makes you act the way you act? If your behavior is the way you behave, what makes you behave the way you behave? Why are you who you are, and why are you how you are?
These are inevitable questions that fathom each fiber of one's existence. Albeit, they can be swept under the rug, psychoanalysts delivered an answer on the platter. One of them is Sigmund Freud with his claim: human behavior results from desires, impulses, and memories that have been repressed into an unconscious state yet still influence actions. The human mind consists of a tiny, conscious part available for direct observation and a much larger subconscious portion that plays an even more critical role in determining behavior.

However, Sigmund Freud was not the only one who contributed to the paradigm of psychoanalytic approach. Other psychoanalytic theorists have deviated from traditional psychoanalysis to develop their ideas that address factors other than those identified by Freud. Carl Gustav Jung proposed the idea that occult occurrences can and do influence everyone's lives. Jung believed that people are driven not just by repressed experiences but also by emotionally toned memories acquired from their ancestors. The collective unconscious, as Jung called it, is made up of these inherited images. The collective unconscious contains aspects that we have never personally experienced but have been passed down to us from our ancestors (Feist and Feist, 2008). He developed Levels of Psyche in the same way that Sigmund Freud did. Also, he used the terms personal conscious, personal unconscious, and collective unconscious to refer to the levels. Whereas Freud saw each person's unconscious as unique and distinct from the unconscious of others, Jung claimed that a portion of our unconscious is shared with all other members of the human species. He described the human psyche into three parts: personal consciousness, a state of awareness of the present moment that, once passed, becomes part of the individual's unique unconscious. The collective unconscious lies beneath both of these, a repository of human knowledge, experiences, and images of the human race (Dobbie, n.d.). Jung was adamant that the essential part of the unconscious springs not from personal experiences of the individual but the distant past of human existence, a concept he named the collective unconscious (Feist and Feist, 2008). People are motivated, according to him, partly by conscious thoughts, partly by images from their unconscious, and partly by latent memory traces passed down from their ancestors (Feist and Feist, 2008).

Another is Alfred Adler, the first psychoanalyst to use his approach, Individual Psychology, to expand psychological theory beyond the Freudian viewpoint. He proposed that present and conscious forces influenced a person's psychology and that the influence of the social realm and environment was equally vital (Collin, n.d.). Unlike Freud, who reduced all motivation to sex and aggression, Adler saw that humans are motivated mainly by social forces and a desire for superiority or success. Unlike Freud's assumption that past experiences determine present behavior, Adler argued and posited a notion that current behavior is determined by people's view of the future (Feist and Feist, 2008). To Adler, people's interpretations of experiences are essential than the experiences themselves. The present behavior is not determined by the past or the future. Instead, people are motivated by their present perceptions of the past and their present expectations of the future (Feist and Feist, 2008). These perceptions do not necessarily correspond with reality, and as Adler stated, “meanings are not determined by situations, but we determine ourselves by the meanings we give to situations”. People are forward-moving, driven by their future goals rather than by innate instincts or causal forces. These future goals are often rigid and unrealistic, but people's freedom allows them to alter their plans and change their lives. People create their personalities and can change them by adopting new attitudes. These attitudes include the understanding that things can change, that no one or situation is accountable for who a person is. Those personal goals must be subordinated to the social interest (Feist and Feist, 2008). However, it is Freud and his principles that became the foundation of Psychotherapy.

“The mind is like an iceberg; it floats with one-seventh of its bulk above water", an adage from Sigmund Freud, the Father of Psychoanalytic Theory (Collin, p. 96). He developed the Model of Human Psyche, asserting that minds are a dichotomy consisting of the conscious (the rational) and the unconscious (the irrational). The conscious, according to Freud, perceives and records external reality and is the mind's reasoning part. Meanwhile, the unconscious accumulates suppressed and unresolved conflicts that have an impact on everything we do. As a result, he posits that the unconscious, rather than the conscious, governs a substantial portion of one's actions (Bressler, 1999).

According to Benson, Freud claimed that the active state of consciousness is only a tiny part of the total psychological forces at work in our physical reality. The consciousness exists at the superficial level, to which we have easy and immediate access. The powerful dimension of the unconscious lies beneath the conscious, the warehouse from which our active cognitive state and behavior are dictated. In the hands of the unconscious, the conscious is practically a puppet. The conscious mind is merely the surface of a complex psychic realm. He believes that the unconscious influences a large part of how we act, think, and feel.

Furthermore, hidden from the conscious mind (which Freud compared to that small portion of an iceberg visible above the water's surface), the unconscious is like the powerful unseen mass below it. Because the conscious mind is not aware of its submerged counterpart, it may mistake the real causes of behavior. An individual may not tell the difference between what is happening and what they think is happening. In short, the actions are the product of forces that the human psyche cannot recognize and, therefore, is unable to control (Dobbie, n.d.).

As Psychoanalysis became a method of treating emotional and psychological disorders, Psychology attested to and adapted this. Freud had his patients talk freely about their childhood experiences and dreams in a patient-analyst setting during psychoanalysis. Dreams, according to Freud, are the best way to discover the content and activity of the unconscious. According to Freud, we shape ourselves and our world through the interaction of the conscious and unconscious (Bressler, 1999).

Sigmund Freud collaborated with Josef Breuer to apply a new method of treatment to a patient named Anna O, whose real name is Bertha Pappenheim, in the first instance of intensive psychotherapy as a treatment for mental illness and the development of psychoanalysis. Breuer began using hypnosis to help her remember a traumatic event, and after twice-weekly hypnosis sessions, all of her symptoms had subsided. Breuer concluded that her symptoms resulted from disturbing memories buried in her unconscious mind and that speaking the thoughts brought them to consciousness, allowing the symptoms to go away. Breuer began treating Anna O with a "talking cure", which systematically relieved Anna's symptoms until she died. Freud used psychoanalysis, and Anna was the first psychoanalytic patient (Skues, 2006). According to Breuer, Anna was intelligent, poetic, and showed no signs of neurosis during her growth period. Still, she had hysterical paralysis and was unable to accept food from anyone except him. However, according to Borch-Jacobsen (2014), her life changed when she was able to drink one day during hypnosis, which was thought to be impossible in her case. According to Josef Breuer, she "drank a large quantity of water without any difficulty and woke up from hypnosis with the glass at her lips; and thereupon the disturbance banished, never to return".

Meanwhile, as a result of what happened to Anna O, Breuer and Freud stated in their book "Studies on Hysteria" those traumatic memories can be "talked away" under hypnosis. Similarly, Anna O's case gave Freud an idea about forgetting, which he called "dissociated consciousness", "the unconscious", and "repression" (p. 3, 4 & 5). The case of Anna O demonstrates that psychoanalysis is more than just textual interpretation; it is also an essential tool in clinical psychology.

They discovered that simply asking the patient to describe her fantasies and hallucinations could significantly reduce the severity of her mental illness symptoms. Breuer became Freud's friend and colleague. The two collaborated to develop and popularize a method of psychological treatment based on the idea that many types of mental illness were the result of traumatic experiences that occurred in the patient's past and were now hidden away from consciousness. They claimed to have discovered a way to release the repressed memory from the unconscious through Freud and Breuer's technique, outlined in the jointly published Studies in Hysteria (1895), allowing the patient to consciously recall the memory and confront the experience, both emotionally and intellectually. The procedure released the stifled emotion, and the symptoms vanished (Collin, n.d.).

According to Freud, the unconscious is also a repository of hidden truths and desires that yearn to be revealed in and through the conscious. These hidden truths and desires will inevitably come to light through Freudian Slips: innocuous actions such as unintentional slips of the tongue, memory failures, misplacing of objects, or misreading of texts. These parapraxes reveal our true intentions or desires most vividly in dreams, art, literature, and play (Bressler, 1999).

The application of the same methods to literary interpretations is known as psychoanalytic criticism. Psychoanalytic criticism, unlike some other schools of criticism, can coexist with any other critical method of interpretation because it attempts to explain the hows and whys of human actions (Bressler, 1999). As a result, literary works must be treated as if they were dreams, with psychoanalytic techniques applied in texts to uncover hidden motivations, repressed desires, and wishes (Bressler, 1999).

Although Literature is defined as published works of fiction and nonfiction in which compositional excellence and innovation in the art of writing take precedence over benefit or commercial appeal (Hancock, 2006), its other function is determined by the lens of psychology. Literature is regarded as a manifestation of "personality", "inner drives" or "neurosis" from a psychological perspective. It includes the author's, characters', and even the psychological aspects of creation.

According to Niaz et al. (2019), dealing with psychoanalysis necessitates an understanding of the author's background and relationship to the text. Works of art or literature reveal a great deal about their creator's psychology, and as Freud demonstrated, their construction is similar to that of our dreams. The same mechanisms that govern the elaboration of our strongest, though most carefully concealed desires in dreams and nightmares, desires that are frequently the most repugnant to consciousness, also control the elaboration of a work of art (Wright, n.d.). Using psychoanalytic theory to analyze a piece of literature allows the reader to consider how the author's repressed desires, fears, and impulses are represented in writing. The psychoanalytical analysis also considers how the literature depicts the author's isolation from events, or even denial of the existence of certain events and circumstances, by identifying the inner workings of the mind (Barry, 2014).

Because literary works, even dreams, and fiction, have reality to express, they merely need to be analyzed. The reader's reaction to a text, according to Joseph, is crucial in psychoanalysis since it is personal. Furthermore, he emphasized that in psychoanalysis, the real significance of the text is the meaning created by an individual's psyche, whether unconsciously or consciously.

According to Emig (2008), psychoanalysis in literature uses text-based methods, and it shares the poiesis of images and expressions, the poetics of their arrangement, the grammar of narratives, as well as a theory of interpretation with literature. The poetry of dreams, the drama of ur-scenes, and the narratives that emerge from them are all terms used by psychoanalytic theories to describe their material.

Ernest Jones' Essay on Hamlet was one literary analysis that used Freud's approach (1910). Jones asserted that Hamlet's delay in exacting vengeance on Claudius stems from the protagonist's own "disordered mind". Specifically, Jones saw Hamlet as suffering from an Oedipal complex, which manifests itself in manic-depressive feelings, misogynistic attitudes, and disgust for sexuality. According to Jones (1910), Hamlet postpones his vengeance because he unconsciously wants to kill the man who married his mother, but if he punishes Claudius for doing what he wished to do, he would also be killing himself. His repressed desire for Gertrude, who is overly affectionate toward him, triggers him to treat Ophelia with cruelty far out of proportion to anything she deserves, which is also a result of his Oedipal neurosis. When he orders her to a nunnery, the slang meaning of brothel makes it clear that he regards all women, even innocent ones, as repugnant. His disgust with sexual matters is evident throughout the play, as evidenced by his anger at Claudius and Gertrude's marriage, as well as his repugnance of Ophelia (Dobbie, n.d.).

Moreover, Freudian psychoanalytic may also be applied in hermeneutic analysis or the interpretation of a text; it was proven in the study of Sy et al. (2019), which focused on Selected Philippines Presidential State of the Nation Addresses (SONA). The study has shown that Freudian elements can be seen in gestures, actions, and body movements of the Philippine Presidents. They assessed Freud's psychoanalytic notions in the speeches and how they were presented using hermeneutics as the effective research technique used in the study. Furthermore, the study showed that the prevalence of Freudian elements in the SONAs have influenced the Presidents' leadership style and decision-making with their various regimes. For instance, based on the study, this was evident in the gestures of President Arroyo as she showed off the accomplishments of her "Strong Republic". It was also apparent in the strong message carried out in President Duterte's constant battle against corruption and illegal drugs and President Aquino's laid-back, relaxed vernacular undertones of his "Straight Path".

The gestures and movements of the Presidents in their respective SONAs reflect the sentiments and issues of the time it was delivered. It highlighted how these gestures and body movements of the nation's leaders might be used to make guided conclusions based on the background and present political feelings on issues. Speeches like the State of the Nation Address communicate a lot of meaning through gestures and body motions. Also, the study has revealed that the id, ego, and the superego are all significant on each President's SONA. Thus, understanding the political intentions, attitudes, and concerns of political players requires nonverbal communication since these behaviors demonstrate dedication and sincerity. Therefore, the aforementioned study may solidify that actions have an impact on each decision which the researchers will utilize in evaluating.

Psychoanalytic criticism adopts the methods of "reading" employed by Freud and later theorists to understand texts, according to Michael Delahoyde (2018), a professor at Washington University. He claims that "literary texts, like dreams, reveal the author's hidden aspirations and fears and that a literary work is an expression of their neuroses. While it is possible to psychoanalyze a specific character in a literary work, it is typically thought that all such characters are reflections of the author's psyche" (para. 1).

He also stressed that using a psychoanalytic method entails "searching for evidence of unresolved emotions, psychological conflicts, guilt, ambivalences, and so on within what may appear to be a disjointed literary work" (para. 3). The characters' behavior in the literary work will reflect the author's traumas, family life, sexual difficulties, fixations, and other issues. However, psychological material will be expressed indirectly, disguised, or encoded (as in dreams) using principles like 'symbolism' (the repressed object portrayed in disguise), 'condensation' (multiple thoughts or persons portrayed in a single image), and 'displacement' (anxiety located onto another embodiment by association)" (para. 3).

In the meantime, according to Peter Gay (1989) in his book "The Freud Reader", psychoanalytical literary criticism is concerned with dreams on one level because dreams are a reflection of dreamers' unconscious psychological conditions. Dreams, according to Sigmund Freud, are "guardians of sleep" where they become "disguised fulfilments of repressed wishes." Dreams, according to Freud, are the 'royal path' of the dreamer's unconscious, and they have a direct relationship to literature, which often resembles the pattern of a dream." "Unlike some other schools of criticism, the psychoanalytic approach can exist side by side with any other critical way of interpretation," according to Charles Bressler (1999) in his book "Literary Criticism: An Introduction to Theory and Practice". Marxists, feminists, and New Historicists, for example, use psychoanalytic methods in their interpretations without violating their hermeneutics because this approach tries to explain the hows and whys of human actions without developing an aesthetic theory—a systematic, philosophical body of beliefs about how meaning occurs in literature and other art forms. Psychoanalytic critique, rather than being a specific school of criticism, is better described as a method of literary interpretation" (124).

In contrast, according to Maud Ellman's book (1994), "In literary studies, for example, psychoanalytic critique frequently overlooks the textuality of texts, their verbal surface, in favor of the encoded Freudian patterns in their depths". The piece of art is frequently viewed as a window into the artist's sex-tormented soul (2). "Classic psychoanalytic critique, according to Peter Brooks, displaces the object of analysis from the text to some person" whether the author, the reader, or the characters, all of whom are considered as autonomous persons rather than functions of the text itself (Ellman, 1994, p. 3).

The researchers utilized Sigmund Freud's Personality Theory in unlocking the unconscious of the main characters, namely: Makaraeg, the Boy, Adolfo, Maria Cassandra Alvarez, Fray Burgos, Tara N. Lim and the Doorkeeper. The researchers scrutinized which among the Id, Ego, and Superego was dominant in the Human Psyche of each of the main characters and how it influenced their decisions.

Sigmund Freud was an Austrian neurologist and the founder of psychoanalysis, whose psychological theories became the cornerstones of psychoanalytic criticism. His notable principles are as follows: Economic Model (Pleasure and Reality Principles); Dynamic Model or Levels of Mental Life (Conscious, Preconscious, Unconscious); Tripartite Model or Provinces of the Mind (Id, Ego, Superego); The Oedipus, Castration, Electra Complex; Interpretation of Dreams (Displacement and Condensation); Phylogenetic Endowment; Dynamics of Personality; Drives (Sex and Aggression); Anxiety (Neurotic, Moral, Realistic); Defense Mechanisms (Repression, Reaction Formation, Displacement, Fixation, Regression, Projection, Introjection, Sublimation); Dream Analysis; and, Parapraxes or Freudian Slips.

According to Freud, people's behavior is affected by their unconscious, which is influenced by childhood events. Freud classified these occurrences or events into developmental stages involving inner drives, desires, and pleasure on which people concentrate. The said stages reflect the most basic levels of desire, but they also include loss, fear, and repression. He also contended that people bury or repress traumatic experiences in their subconscious through defenses such as selective perception, selective memory, displacement, projection, regression, and so on. Moreover, Freud posited the concept of Id, Superego, and Ego.

The study aimed to understand the choices and actions of the main characters through the application of Freudian Personality Theory. Thus, the study would like to unveil which among the personality elements is dominant in each action. Also, the researchers would like to define the relationship of literature and psychology and how each other may be significant to the other discipline. Lastly, the researchers aimed to prove the importance of graphic novels as a suitable medium in literary studies. Moreover, the study will be beneficial to the academe, future researchers, and most importantly, to the community.

First, it will be beneficial to the academe because the teachers and the students may use this study as an eye-opener in the importance and significance of psychoanalysis since, according to Hossain, psychoanalysis makes a text creative for it adds legitimacy and value to it. Therefore, this enables a reader to explore new points of view in reading, studying, and teaching literature. Furthermore, the students may appreciate the beauty of graphic novels and the importance of this genre in literary analysis. Likewise, it may serve as their scaffold in learning the interpretation and significant messages presented in the graphic novel. The existence of the study is vital for the teachers to use it as a medium of proposing a psychoanalysis study. The study may also benefit the teachers in enlightening that graphic novels can serve as a convenient way of engaging reading in the lesson because it may be attractive to the students because images and text are present. The study will serve as a force to promote the importance and effectiveness of graphic novels to learn vocabulary words, grammar rules, and concepts. Likewise, the study will be beneficial to future researchers, for it may become their basis in the undertaking of their study. This study will help them to have a broad perspective of the graphic novel. Lastly, the study will be beneficial to the community because the lessons from the consequences of each action will enlighten them to be mindful in decision-making.

Anteroom is an outer room that leads to another room and that is often used as a waiting room. Ego is the province of the mind that refers to the "I". This is the middle part that needs to struggle and mitigate, process and make sense of the warring conflict between both Id and Superego. Human Psyche is the totality of the human mind, conscious and unconscious. The Id is the region of personality which is the home base for all instincts, and its sole function is to seek pleasure regardless of consequences. Superego is the moral or ethical processes of personality. The superego can be thought of laws, or rules that are in place to keep the desire and impulsive part under control.

The unconscious is similar to an anteroom---- a large entrance hall in which many diverse, energetic, and disreputable people are milling about, crowding one another, and striving incessantly to escape to a smaller adjoining reception room. However, a watchful guard protects the threshold between the large entrance hall and the small reception room. This guard has two methods of preventing undesirables from escaping from the entrance hall--- either turn them back at the door or throw out those who earlier had clandestinely slipped into the reception room. The effect, in either case, is the same; the menacing, disorderly people are prevented from coming into view of an important guest seated at the far end of the reception room behind a screen. The people in the entrance hall represent unconscious images. The small reception room is preconscious, and its inhabitants represent preconscious ideas. People in the reception room (preconscious) may or may not come into view of the important guest who, of course, represents the eye of consciousness. The doorkeeper who guards the threshold between the two rooms is the primary censor that prevents unconscious images from becoming preconscious and renders preconscious images unconscious by throwing them back. The screen that guards the important guest is the final censor, and it prevents many, but not all, preconscious elements from reaching consciousness. However, through this study, the researchers will open the said anteroom to explore what resides in the terra incognita province of mind--- unconscious.

If the Doorkeeper in the graphic novel served as the unyielding guardian of ways of the time and space which appears to people that face crossroads or on the brink of making pivotal decisions to show them the consequences of either decision, the researchers would serve as the Doorkeepers of the Anteroom of the Human Psyche (the totality of mind) of the main characters. The researchers will unlock the unconscious through unraveling the desires, regressions, repressed emotions--- to analyze how they serve as inner drives of the actions of each main character.

Methodology

In line with the objectives, the researchers utilized Freudian Personality Theory in analyzing the graphic novel "Doorkeeper". They sought to unravel the unconscious of the main characters by analyzing which among Id, Ego, and Superego dominated and influenced their actions or behavior in the course of the narrative. Therefore, the researchers used the following questions as a guide in the analysis: 1) Which personality element dominates the main characters? 2) What are the implications of the dominant personality element in the main character? 3) What is/are the effect/s of the decisions/actions in the unconscious part of the mind?

Meanwhile, the researchers have embarked on the graphic novel "Doorkeeper" using Freud's Personality Theory. It is written by two Filipino writers, Scott Lee Chua and Ethan Chua, and comprises six chapters and six separate stories about six different people. Each story weaves together by Philippine history, mythology, and literature. Doorkeeper is a graphic novel, as opposed to other novels. The term "graphic novel" was coined when Will Eisner's A Contract with God: And Other Tenement Stories, a graphic novel, was published in 1978. He accidentally happened to use it when searching for a publisher for his work, and the term has gained a lot of popularity. However, Eisner considered the term limited and preferred to use "graphic literature" or "graphic story". As a result, the term has been criticized and debated. There are numerous definitions of a graphic novel and how it differs from "comic books." "Book-length comic books that are meant to be read as one story, including collections of stories in genres like mystery, superhero, or supernatural that are meant to be read apart from their associated continuous comic book storyline," according to Stephen Weiner. Graphic novels, on the other hand, are defined by Christopher Murray (2017) as "a type of text mixing words and images—essentially a comic, although the term most frequently refers to a complete story presented as a book".

The graphic novel falls under the category of Emergent Literature. The Cambridge Dictionary defines Emergent as "starting to exist or become known," whereas Wiktionary defines "emergent" as "coming into view or existence". In addition, the Oxford English Dictionary defines "emergent" as "new and still developing". Merriam Webster Dictionary defines it as "arising as a natural or logical consequence" as well as "newly formed or prominent". To put it simply, emergent literary genres have recently emerged or are just starting to gain popularity. To put it another way, these are literary genres that are in the process of forming or becoming well-known. Such research would spark discussion about the apparent connections between literature and psychology, thus contributing to and setting a paradigm for future research in this topic.

The graphic novel "Doorkeeper" is considered emerging literature, new to literary analysis. As a result, the researchers discovered that no previous research had been done on the literary piece. The researchers have utilized Sigmund Freud's "psychoanalysis principles or methods of interpretation" to decipher the graphic book, classified as the "Psychoanalytic Approach". Furthermore, the researchers have limited the study to the characters and use them to unlock the anteroom of the human psyche. The researchers have been the proponent in using psychoanalysis for the graphic novel. Moreover, the research has aided in the in-depth examination and extraction of the literary piece's true substance.

Results and Discussions

A. Dominance of Makaraeg's Superego

The first chapter of the graphic novel transpired during the year of the Eclipse, the land of Mindoro was being assaulted by the serpent-like dragon Bakunawa. Makaraeg heard that a child died in the incident. As Kaptan's chosen one, he must protect and serve his people. He promised to redeem the child's soul at all cost. He already knew that this obstacle might lead to his death; thus, he entrusted his people to his son, Gani.

As he faced the demon, he chanted the mantra "O Kaptan, ibalik kamo sa kagatang bulan" which served as his strength to battle the Bakunawa. He managed to scar Bakunawa's foot, but in return, he was injured. When Makaraeg was about to be eaten by the Bakunawa, time stopped. The Doorkeeper showed itself to Makaraeg. Distraught about what is happening, Makaraeg still managed to compose himself. Doorkeeper assured him that the Bakunawa was frozen and they were trapped between two heartbeats. He recounted Makaraeg's past—Kaptan had chosen him when he was newborn, and his parents had to give him up. Makaraeg served Kaptan all his life, and he has done enough. However, tonight, Doorkeeper assured that Kaptan's laws do not bound Makaraeg, and he could end his life-long servitude just by choosing not to.

The Doorkeeper offered Makaraeg two choices: to run and be honored as a fallen hero, but in return, his village will be slaughtered, or to fight the Bakunawa and greatly suffer. Makaraeg asked the Doorkeeper if he would die fighting the Bakunawa. However, the Doorkeeper was not able to see Makaraeg's fate nor how the battle would end. Consequently, Makaraeg chose the latter, and the Doorkeeper moved on.

Makaraeg's Selflessness

In the chapter, it was evident that Makaraeg was driven by his morality or Superego. It was shown when Makaraeg heard the news about the Bakunawa; he did not hesitate to fight even though he knew it could lead to his demise. He assured 'Nanang' to redeem the soul of the child. Moreover, he did not let his son join the battle; instead, he entrusted the village to him. He chose to face the Bakunawa alone, thinking that it was to save his people.

Makaraeg: Be at peace, Nanang. I will redeem her soul.
Gani, our people are here. Stay with them.
Should I not return, take care of them.

Furthermore, the Doorkeeper offered choices to Makaraeg, which are to run and be honored or to fight and suffer. The two choices represent a clash of the Id and the Superego. Nevertheless, Makaraeg chose to fight and suffer alone, which is a selfless decision and an act of heroism. With that, it was the Superego that was dominant as he chose the welfare of the village over his. The Superego provides us all with our sense of what is right and what is wrong and demands that we often behave in ways acceptable to society at large rather than to our individual urges (Rennison, 2001).

Makaraeg: I have a duty to my people…
Leave me. I have chosen.

The selflessness of Makaraeg in the story was driven by his Superego since he knew it was his responsibility to the village. Therefore, Makaraeg was driven by his ego-ideal, for he followed the social standard entrusted to him. The Superego has two subsystems which are the conscience and ego-ideal. The ego-ideal results from proper behavior, which dictates a person on the best action he/she can do (Feist and Feist, 2008).

On the other hand, the story of Makaraeg was once told in the fourth chapter as Makaraeg, and the Doorkeeper met again. He is still trying to defeat the Bakunawa even after years of fighting. They had a chance to talk that led to Makaraeg missing his son and his village. Meanwhile, the Doorkeeper showed how the life of Gani, Makaraeg's son had unfolded - Makaraeg was satisfied. Before they bid farewell, the Doorkeeper gave Makaraeg a chance to change his choice, but his decision is firm as he does not want to run away from his duties.

This chapter showed the reality of Makaraeg's life. As a human, he can still be manipulated by his Ego or the reality where we feel emotions. Makaraeg's feeling of missing his son is because of his Ego as he is reminiscing moments in which life is an endless battle. However, at the end of their conversation, Makaraeg overcame his Ego and let his Superego dominate as he became firm in his decision to fight the Bakunawa.

Makaraeg: And my answer has not changed.
I will not run.

Likewise, there is an instance in the final chapter where the Doorkeeper came to Makaraeg to warn him about the end of the world and the wastefulness of Makaraeg's fight with the Bakunawa. It was also mentioned that Makaraeg's son had already died, and until the end, Makaraeg had shown an immeasurable amount of selflessness as he decided to fulfill his responsibility. He also instructed the Doorkeeper to save other children against the upcoming chaos. Therefore, as Makaraeg was driven by his selflessness, according to Isaoglu (2014, p. 502), “the Superego struggles to attain perfection or satisfaction”.

Makaraeg: Then go where you must! I will not run.
But for other sons, other daughters…
I do the best I can.

B. Dominance of the Boy's Id

The second chapter of the graphic novel took place in Leyte in 1941. It began with an unnamed boy reclining in a Narra Tree while his father assembled a treehouse out of deadwood. Most mornings, his breakfast was pandesal, and munggo spooned steaming over rice. However, one day, while he was nestling in the Narra's branches and calling out the different types of birds by their name, he saw something unfamiliar. It was a vast, bird-shaped, green metal with red circles on its wings flying through the skies. He stopped in his tracks and stared at it with bewilderment.

At night, the sound of splinters and the rush of wind caused by the bird, which the boy's father called "airplane" disturbed the tranquility. There were tremors; thus, the father sawed a hole into the floor of their house. One night, the boy's mother roused him up to descend into the pit. When the morning came, the father was nowhere, and no one knew his whereabouts. The boy then took his father's bolo and ran deep into the forest, where he stumbled upon a blue-haired girl with pointy, long ears. She also has fins on both her elbows and ankles.

The boy and that girl ran in circles until evening and went to the father's treehouse. The games they played unfolded into months. However, at home, food grew scarce to the extent that the boy had almost forgotten the taste of munggo. He almost forgot the smell of air without smoke. The girl took him to the shore before the gulf. She brought him to a palace under the sea and let him meet her mother--Allmother. However, when they resurfaced, those surface-dwellers riding airplanes were hovering above dropping bombs. The boy then took his father's bolo and pledged to the girl that whatever happens, he will keep her safe. The next scene was his mother waking him up for them to flee. He sailed out onto the bay, but he promised he would come back someday.

The next scene took place in Manila in 1958. The said boy is now a man, writing in his office. In front of him are Allmother and Doorkeeper. Allmother was recounting the boy's past to him to make him remember his childhood, the war, and his encounter with them. The man asked himself whether he remembers Allmother, but he answered "No".

The last scene was Underwater, where Allmother conversed with the Doorkeeper about how people could easily forget them as if they had never lived. She said they were past pleasantries, and stories of war replace their tales. She asked the Doorkeeper if he could save them, but he said there are rules. In the end, Allmother surmised that "to be forgotten" is her and her daughters' fate. In the end, she told Doorkeeper they all must change; else, the world moves on without them while vanishing into thin air.

The Boy’s Id vs. Allmother’s Superego

In this chapter, the young boy and the Allmother are the main characters in the story narrated by Allmother. It was seen in the story that the young boy was dominated by his Id. It was shown in the first part of the story where he is satisfied with his pleasure of playing. The Id was nurtured to people as it was present even after birth, where selfish desires and impulses aimed for immediate gratification (Rennison, 2001, p. 38). Moreover, the young boy was able to sustain the dominance of his Id even though he became mature. It debunks Freud’s claim that the Id may fade as a person gets older since it must be left behind (Rennison, 2001).

Furthermore, the repression of the young boy of his past memories of war and loss of his father could be classified as driving forces why the young boy’s Id continues to dominate. He refused the Allmother, together with the memories of his childhood. The Id may not be left behind because its demands may be repressed through dreams and neurotic symptoms (Rennison, 2001, p. 39). The following lines are the proof of the repression shown in the story:

> All other: You must remember us. You must
> The Boy: Do I remember you? No.

On the other hand, All other was dominated by her Superego in the story. It was evident as she accepted her fate when the Doorkeeper came to her. She accepted her fate to be forgotten and didn't repress to fulfill it.

> All mother: Perhaps this is my fate… to be forgotten. Or perhaps I'm just afraid to die.

Moreover, All mother's selflessness was shown at the beginning of the story when her daughter brought the young boy into their kingdom. She accepted the boy with hospitality, and this action may be classified as socially inclined or based on social norms. The superego provides us a conscience to know what is right and wrong. Therefore, it urges a person to act in what is acceptable to society rather than based on individual desire (Rennison, 2001).

C. Dominance of Adolfo's Superego

The third chapter of the graphic novel took place in the outskirts of Oroquieta, the year 1560. It begins with King Adolfo, a newly appointed king, captured in the wilderness by a female Moro warrior, Lady Flerida. The latter suspected him as a spy, but Adolfo recounted his past. He grew up idolizing Aliguyon, the virtuous hero Hanangga. He also asked his mother whether he could save Albanya and become King like Aliguyon albeit knowing that Florante would succeed the throne for being the King's son. Few years passed, and he was sent to Iligan to study. At school, Florante and his friends bullied Adolfo. The former called Adolfo's mother 'whore' that sparked a ferocious sword fight. Adolfo found an opening enough to slit Florante's throat, but time stood still. The Doorkeeper came and showed what would happen if he would kill Florante: he would be the King of Albanya, but he could not save his subjects during the war with the Sultan's armies. Doorkeeper also showed Adolfo what would happen if the latter yielded: he would be a lowly adviser.

Thirty years later, Florante was the King but had left for Oroquieta to help his Uncle in the war. Thus, Adolfo became the newly appointed King in his stead per rules written in the code of Kalantiaw. Albanya was not pleased to have him as the King; thus, he decided to follow Florante to Oroquieta to help. Their armies accompanied him. They arrived in the outskirts of the said place in the evening and camped there for the night. However, he was alone when he woke up in the morning— left and betrayed by them. His noble intent moved Flerida. Just as Adolfo made his intentions clear, another female warrior shot him with an arrow that led to his death.

Adolfo's Superego

> Adolfo: Growing up in the shadow in the King's castle, I found adventure in my mother's tales. My favorite was that of Aliguyon, the virtuous hero of Hannanga.

When Adolfo was a child, his Id was dominant, for he had this desire to become the King, albeit knowing it was his cousin who would succeed the throne. He had this yearning to be like Aliguyon, without considering the massive responsibility accompanied by being a ruler. According to Freud's psychoanalytic theory, the Id is the primal and instinctual component of the mind that holds sexual and aggressive desires as well as repressed memories. The newborn child's personality is all Id, and it is only later that Ego and Superego develop (McLeod, 2018).

On the other hand, it was the Superego that was dominant as Adolfo grew up. During the fight with his cousin Florante, he was just a sword-stroke away from claiming the crown. He could have just slit Florante's throat, and he would be appointed as a king he desired since he was a child. However, he did not kill Florante upon Doorkeeper, showing the consequences when Adolfo becomes a king: not able to protect his nation from the Sultan's armies.

> Adolfo: There was one where I was King. I was loved and feared in equal measure. All I had to do was kill Florante.
> But when the Sultan's armies came for Albanya… I could not stop them.

He yielded from the said fight and surrendered his desire for the welfare of his nation. He chose the safety of Albanya even if it will make him just a lowly adviser instead of being a king.

> Adolfo: There, I was but a lowly adviser.
> What did I choose?
> I yield! I yield!

The Superego's job is to keep the Id's urges from dominating, especially those that society forbids. It also persuades the Ego to pursue moralistic goals rather than just realistic ones and strive for perfection. The conscience and the ideal self are the two systems that make up the Superego. The conscience can punish the ego by creating guilt in it. The ideal self (or ego-ideal) is a fictional representation of how you should be, representing career goals, treating others, and acting as a member of society (McLeod, 2018).

D. Dominance of Sand's Superego

The fourth chapter of the graphic novel was the journey of a band in Malate in 1980 and their life after the band split up six years ago. Maria Cassandra Alvarez is the main character in the chapter. She was part of the band named "Underground Railroad" together with Ian and Nat. In the first part of the chapter, Cassandra, also known as Sands, is talking with her friend, Ariana or Ry, about her plan of migrating to California and the latter's plan to ask someone out. They also about how unsafe it is outside and the hearsay about communists and rebels.

One night, Sands had an opportunity to bond with Ian and Nat. During their talk, Ian suggested rebuilding their band since there are people who still recognize them. He wanted to administer a concert with them singing: 'Luhang Bayani' and 'Munting Kidlat' that could spark revolution and uprising against the government. Sands disagreed with the suggestion of Ian, which ended in madness. Nat kept on saying that they know what happened to those people who pulled such kind. However, Ian was firm on his resolve that it was the right thing to do.

Outside the bar, a man stabbed Ian. Ian was hospitalized, which provoked Nat to fulfill his wish of holding a concert to rebel against the government. Sands did not know whether to stop Nat when the latter personally asked for her help. However, after four days, the concert would be held. Few minutes before Sand's performance, the Doorkeeper came to her. The Doorkeeper showed Sands the possible consequence of the continuation of their performance. If Sands continue the performance, she would never leave the country, Ian would wake up soon, and Ariana would settle with someone else. However, if she chooses to leave the performance, she will be with Arianna in California to start a new life away from their problems. In the end, Sands decided to be selfless and continued the concert regardless of the consequences.

Sands' Selflessness

In this chapter, Maria Cassandra Alvarez, or Sands, showed selflessness in following her Superego rather than her happiness. She chose to continue performing in the concert to fulfill Ian's wish and stick with Nat, albeit knowing there are spies in the concert and they could be killed for revolting against the government. She could have chosen to go to California with Arianna, but she decided to stay as Superego dominates her.

> Sands: And Nat… I promised her I'd pull her through this.

> She knows there are spies in that audience. That she likely will not make it home in one piece.

It was also shown that the main factor behind Sands' selflessness was Ian, who was stabbed after their argument. With this, the conscience of Sands may be her driving force to be selfless. The conscience is a subsystem of the Superego, which serves as the mechanism of indicating what actions should not be done. It is the result of improper behavior (Feist and Feist, 2008).

E. Dominance of Fray Burgos' Superego

The fifth chapter of the graphic novel was about a Filipino priest, who was also the main character --- Fray Burgos. He had his confession and recounted his sins without knowing it was to the Doorkeeper. He confessed to an incident in which guards beat a man in front of his daughter simply for attending the mass without paying the required contribution. All Father Burgos did was to stand and watch. To clear his mind, he wrote a manifesto regarding the sins of the clergy, who vowed to defend the oppressed even though it took time to fulfill his desire to stop the oppression due to his weak position. He decided to send the manifesto to Spain, yet before making his final decision; the Doorkeeper offered choices that could make Fray Burgos's decision change. However, he is firm in his decision. At the end of the story, the Doorkeeper appeared again, but this time in front of a sacristan. He told him to ring the bell, the sound of the bell signifying the time of death of the three martyr priests.

Clash of Fr. Burgos's Id and Superego

From the incident in the fifth chapter, it is evident that the Id and Superego of Fray Burgos are contrasting. He wants to help his fellow Filipinos (Superego); however, he doesn't want to be punished like them (Id) since the Spanish priests are in observance of the incident. The Id results from the pleasure principle, which is primitive, chaotic, amoral, filled with human drives (Feist and Feist, 2008, p. 28). Fray Burgos has the drive to be protected which makes him be overpowered by his Id.

> Fray Burgos: With a word, I could have stopped them.
>
> But I felt the priests watching me.
>
> So I said nothing.

However, the dominance shifted during his confession to the Doorkeeper as the Superego of Fray Burgos has been authoritative since he wanted to clear his conscience. Preferably, Fray Burgos was affected by his guilt as he had the power, yet he seemed powerless. Freud attested that guilt was present when a person acts or decides contrary to moral standards.

F. Dominance of Tara N. Lim's Superego

The last chapter of the graphic novel was all about Tara N. Lim, who was working as a scientist in the Cavite Nuclear Plant, and her daughter, Iris. Iris was sick and needed an immediate operation; unfortunately, they have no money. One day, the news shocked them as the last farmland on Earth was in flames due to a terrorist attack. As a result, the Asian Council decided to launch a nuclear attack as a defense against the terrorists. Tara was offered to lead the team who will initiate the attack; as a consequence, if she said "yes," the council will pay for Iris' operation. In the end, the Doorkeeper came to Tara and showed her the consequences of whatever action she may have. Unfortunately, before Tara was able to decide, the weapons already filled the sky. The entire universe was placed into chaos. Then, a missile is about to hit the quantum bubble created by the Doorkeeper. However, the Doorkeeper interferes and says that it may save one between Tara and Iris. Tara decided to be selfless as she saved her daughter over herself, for she believed that Iris could make a better world than what she had. Finally, the Doorkeeper saved Iris and brought her into the portal where the last story will transpire.

Mother's Selflessness

In the chapter, Tara was seen to be selfless as she has chosen morality over greed. It was shown when she declined the offer of Mr. Park to initiate the nuclear attack.

Tara: A team of sycophants and murderers? No thanks.

Moreover, Tara's decision may change when they promised her the treatment of her daughter. Probably, this action of Tara may be classified as a selfish act, for she has chosen her daughter's convenience above the world. Hence, by looking through the lens of a mother, it is an act of selflessness as she would choose her daughter's future above her future, as she has chosen to make a better world than to live in an unfair world. Moreover, the moment she decided to save her daughter above any of her scientific achievements is clearly about her selflessness.

Tara: Everything I have, I fought for. Scholarships. Rent.
My inventions run all of Manila, but I can't afford a week off.
You deserve better.

Furthermore, Tara's love for her daughter manifested when she prioritized her daughter's safety above herself. She has shown an extreme amount of selflessness because she believes in her daughter's better life in the future. Motherhood brings a sense of hope, opportunity, and a chance to serve in a critical time (Pryce and Samuels, 2010).

Tara: Because you'd build a better world than I could.
See the universe, Iris.

Therefore, Tara's Superego became her dominant personality in the chapter as she became morally inclined toward motherhood. Hence, motherhood is a moving experience of being a woman as it gives a sense of purpose and a sense of responsibility to care for another life (Aparicio et al., 2015, p. 52).
Doorkeeper as Mediator

The Doorkeeper served as the mediator throughout the main characters in the graphic novel. It balanced a person's selfishness and selflessness. In the case of Makaraeg, the Doorkeeper showed the reality of both sides, be a hero and let the village be wiped or fight the Bakunawa and suffer alone. In the second chapter, it appeared to the Allmother to accept the reality of fulfilling her duty. The third chapter showed Adolfo the reality of painful defeat that he would suffer from the Sultan's army if he killed Florante for the throne and the victory if he let Florante as the king. In the story of Sands, the Doorkeeper showed to her the consequences if she performs and not, the clash of deciding which happiness is vital, other people over herself. While in the story of Fray Burgos, it convinced the friar to change his decision and showed him the reality of death, he may suffer for his actions. Lastly, in the story of Tara, it showed the consequences if she decided to lead the nuclear attack and the reality that no one else would survive. With all the stories presented, the Doorkeeper served as the reality that in every action people have made there will always be a corresponding result. Therefore, in the graphic novel, the Doorkeeper is the Ego that served as the mediator from each character's selfishness and selflessness. The Ego is the reality principle, where it becomes the decision-making part of the mind (Feist and Feist, 2008, p. 29).

For instance, in the story of Sands, the Doorkeeper served as the Ego as it was able to show the reality and the consequences of Sands 'actions---if she performs then Ian will wake up and Ariana will find love, yet if she declines she, herself, may have a wealthy life ahead. Clearly, the Doorkeeper is a reminder of the real world as like the world, it provides two choices in life. Moreover, every decision should be followed by actions.

Doorkeeper: You will choose, here and now, which one comes to pass.

If you perform tonight you never leave the country again. Ian wakes up. Dario never goes home. Arriana settles down with someone else and calls it love.
Now, if you choose to leave…your life goes on in California with…

Likewise, the Doorkeeper served as the human conscience in the graphic novel. The Doorkeeper was like the human conscience, which suddenly shows up in critical situations and will help to think rationally to prevent undesirable things from happening. Hence, the Doorkeeper is just like Christ, He doesn't want humans to stumble in the work of the enemy, that's why He is giving us a chance to do the right thing. Evidently, it is written in the Book of Romans 12:2 "Do not be conformed to this world, but be transformed by the renewing of your mind. Then you will be able to test and approve what is the good, pleasing, and perfect will of God."

The Doorkeeper's Superego

In the end of the story, the Doorkeeper finally made a choice. The Doorkeeper finally decided to follow its will rather than where the path will lead its journey. With this, the Doorkeeper was able to follow its Superego because it became selfless when it decided to save Iris, Tara's daughter. Likewise, the lines below, from the first chapter, may solidify that the Doorkeeper became selfless as it interferes though it is inappropriate.

> Narrator: Doorkeeper, too, was bound by law.
> Never to interfere, only to show the way.

The whole graphic novel ended with a final story about the life of the spider. The spider has been tested by time when different instances destroyed its hard work (web) yet it continues to strive. "Rebuild" is the last word uttered by the Doorkeeper which is intended for Iris. Thus, the word "rebuild" may serve as the moral of the whole graphic novel. According to the Doorkeeper, the universe is a product of a choice, therefore, in life full of choices the superego must be prioritized as it is bound with morality. However, if a choice would lead to an unnecessary outcome, then it is a must to REBUILD.

In the end, the researchers have revealed that psychology and literature are two inseparable disciplines since every piece of literary work features a character whose actions and decisions are influenced by the human psyche. Thus, it was seen that the character, given the chance to decide, is bound by the conscience and social standards which may significantly affect in the decision-making. Furthermore, it was seen that the unconscious part of the mind is not just about the feeling of pain, anxiety and repressed emotions but also filled with heroism and love that are revealed whenever an individual is bound with choices. It was evident through the actions and decisions of each main character that may be urged to repress but decided to be selfless in the end. Lastly, this study highlighted that any form of literature, even comics or graphic novels may be a subject for literary studies. This study may serve as the spark that may ignite the fire of using emerging types of literature for literary analysis. Therefore, comics and graphic novels are not just for entertainment or childhood memories, but may also be utilized for professional studies.

Conclusion and Recommendations

Based on the findings of the study, the following conclusions are inferred:

In this 21st Century, one essential skill that must be possessed and enhanced is decision-making, for it may have specific results. Moreover, humans are endowed with the ability to decide which could carve the path of their life. Like in the graphic novel, everyone had the chance to make a choice. However, the dominant personality type influenced their decisions.

Makaraeg could flee and be remembered as a fallen hero, but his Superego made him choose to endure an endless battle with the Bakunawa; the Young Boy could have chosen to recall the Allmother for her to exist still, but his Id refused— all to protect him by averting his repressed memories about the war from resurfacing. Also, Adolfo could have decided to be the King by slitting his cousin Florante's throat; however, his Superego precluded him upon discovering he could not protect the kingdom from the enemy during his reign. Maria Cassandra Alvarez could have gone to California with Arianna, but her Superego made her still perform a concert against the government, albeit knowing it could lead to her demise. The Superego of Fray Burgos coerced him to write a manifesto to Spain at the expense of public execution to free himself from conscience and guilt. Lastly, Tara N. Lim could have chosen to be saved by the Doorkeeper, but her Superego was dominant-- inducing her to sacrifice herself for her daughter, Iris.

Therefore, things happen not by chance but by choice. No one is a victim of circumstances but a product of their choice. No one is chained with shackles of destiny but by shackles of Free Will. However, either Id, Ego, or Superego maneuvers Free Will.

Everyone can make choices regardless of their social status, gender, power, position, and race. Therefore, a person's life is not dictated by power, fortune, or resources. Life is a clash of divergence, for it is full of offered choices, both positive and negative effects. Hence, there is always a space in any differences, a mediator who serves as a guide in decision-making—the Almighty.

From the time of reproduction, as the male cell decided to travel; from the time of birth, as a baby decided to ask for care and love; and from the time the Sun rises, as a person chose to move, choices have been offered, and a decision has been fulfilled. However, people should consider the holistic aspect and its inclination towards the human conscience on each decision.

The dominant personality type reveals what resides in the anteroom of the human psyche—whether one's action is motivated by one's desires or morality and social standards. The literary text is full of mysteries that are suitable for future studies using different approaches. The graphic novel's life will not be sustained if its exploration will be limited through this study. Therefore, further studies are encouraged.

Acknowledgment

We, the researchers, are genuinely grateful for all the people who supported and guided us for this study to come into fruition. We would like to express our gratitude to our ever-supportive research adviser, Dr. Mark Joseph Layug, who devoted his time in helping us throughout the process of drafting and finalizing the study. Moreover, we would like to extend our gratitude to our research teacher, Dr. Mildred Crisostomo, for sharing her insights and discernment. Without her, the existence of this study is not possible. Also, we would like to thank our beloved teachers for giving us time and motivation to fulfill this study.

Furthermore, we would like to acknowledge the sympathy and patience given to us by our beloved families. Your support is indispensable with our studies as you believed in us throughout the accomplishment of this milestone. Likewise, we would like to commend and recognize the support and love of our classmates. BSED English 3-B, indeed we are all fighters who never stop in achieving our goals. Also, to the members of the panel, who helped us in nourishing this study, without their valued ideas, this study will not materialize.

Most of all, to our Almighty God, for being the Source of our strength, desire, wisdom, and motivation. Clearly, nothing is impossible with You. All praise and glory belongs to You.

To the greatest Glory of God!

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Anomie and Acculturation Stories of Sama Dilaut (Badjaos) in their Adopted Community

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Abstract - This investigation studied a particular group of Sama-Dilaut in Tanza, Cavite. The main purpose is to find out how they have acclimated themselves to the people, and if they have developed anomie in the process. Specifically, the study found out if there was an existing strain between the Badjaos and the residents of the adopted community. Anchored on Schumann's Acculturation Model and Durkheim & Merton's Anomie Theory, the mixed method-sequential exploratory research employed two groups of participants – the Sama-Dilaut group and the selected townsfolk of the progressive first-class town. Qualitatively, the main participants (the Badjaos) answered questions about their daily activities and experiences with the folks. The research looked into the social profile, description of the host community, the linguistic culture of the Badjaos, and a discussion of why they chose to live in the host community. Quantitatively, 200 random people from the community answered questions on how they perceive the Badjaos as a minority group, personality, lifestyle, and social attitudes. Findings show that the Sama-Dilaut tried to accustom themselves to the environment but, the people rejected them. Anomie is unclear due to their peace-loving character. ANOVA corroborated the findings where $F = 11.29549$ using 16 df with p-value = 0.00063 indicating significance at $p<0.05$. The statistical results validate the interview conducted on this group of indigenous people.

Keywords - acculturation, anomie, Sama Dilaut, Badjao, linguistic culture.

Introduction

In a Rappler Philippines (2015) article titled ‘Plight of the Badjaos: forgotten, nameless, faceless,’ the writer lamented that the Sama-Dilauts are the most misunderstood and the most neglected of all indigenous or ethnic-linguistic groups. The article added that they have a citizen issue and economic issue as well. These, the writer explained, were presented for discussion during the First International Conference on the Sama Dilaut at the Mindanao State University-Tawi-Tawi College of Technology and Oceanography (MSU-TCTO) on December 1, 2015. Chancellor Lorenzo Reyes of MSU-TCTO emphasized that the conference aimed to attend to the plight of the Badjaos by calling on the attention of the United Nations High Commission on Refugees (UNHCR) to take a second look at the Badjaos' problems. Then, on December 13, 2016, during the 16th Congress of the Republic of the Philippines in its first regular session, Senate Resolution No. 418 was introduced by the Honorable Senator Mary Grace Natividad S. Poe-Llamanzares with the title ‘Urging a review of state policies, in aid of legislation, with regard to the Badjaos, taking into consideration the indigenous group's apparent societal exclusion and designation as a subordinate social status, with the intention of helping the community in livelihood and improving their cultural and social well-being.’ The resolution cited Republic Act No. 8371 or the Indigenous Peoples’ Rights Act of 1997 which ‘recognizes, respects, and protects the rights of indigenous cultural communities (ICCs) and indigenous peoples (Ips) within the framework of the Constitution.’ The senator indicated, in particular, the plight of the Badjaos ‘who have to give up their seafaring way of life and migrate to urban areas, particularly in Metro Manila.’ She also mentioned that this group lived in ‘coastal settlements in the Sulu archipelago particularly in Jolo, Tawi-tawi, and Sitangkai while others scattered in Davao, Surigao, Zamboanga, Basilan, Bohol, Cebu, and Manila in search for livelihood.’

Senator Poe-Llamanzares's senate resolution has proven this present research and its assertions on how the Badjaos' lives were in danger daily as they vied for their lives in the busy streets of their community. Therefore, this study adds impact to what people see every day in the streets of Metro Manila, the provinces nearby, and even in the Visayas region. It intended to verify how Filipinos living among them look at, treat, and reportedly disparage these indigenous groups despite their visibly pitiful condition of begging, roaming around, and making the busy streets their literal playground and park.

The research found out how the Badjaos accultured themselves to the language and the culture of the community. In addition, as they are aware of their surroundings and how they receive unwanted treatment, the study ascertained the presence of strain between them and the townsfolk.

Researches about Badjaos usually center on displacement, phenomenological studies of their lived experiences, otherization, or territorial problems. This research, however, tackled the linguistic notions of acculturation and anomie, which the present researcher believes are the primary experiences of these Filipino nomads.

The sad plight of the Badjaos started in the late 20th century when they had to leave their original place of domicile in the waters of the Sulu Sea between Tawi-Tawi and Sabah. There was rampant dispersion that they had to emigrate because the Moro Islamic Liberation Front (MILF) and several sea bandits claimed their lands, and even their sea, which is their natural domain of abode.

Soriano (undated), in his article "Badjaos: Castaway from Mindanao to Manila, shared an account of the place of the Badjaos ransacked by armed marauders. Since the Badjaos are by nature peace-loving, they had no other choice but to accept their fate and leave their original abode. From making Manila their adopted city in the 1970s, they have since migrated to other parts of Luzon, from Cavite to Quezon in southern Luzon to the most southern part of the Bicol Region. They have also found places to stay in the north Luzon areas like Bulacan, Pampanga, Nueva Ecija, and La Union. Even in the Visayas, the Badjaos also dwell particularly in the cities and busy towns elsewhere.

News reports also narrated how this group became victims of human trafficking and other crimes. In the PhilStar Global report (2021 June 7), 250 Badjaos were rescued, according to the Inter-Agency Council Against Trafficking (IACAT). Luckily, they were returned back to their point of origin in Zamboanga. In the same news, just a week before this incident happened, a group of 303 Badjaos who, again, were victims of human trafficking, was also rescued and sent back to their original place in Zamboanga. Unfortunately, four members had to stay in Manila because they contracted COVID-19 and had to stay in the hospice.

In the article ‘Our Badjao Brothers and Sisters,’ (2018) released in The Manila Times, Marit Stinus-Cabugon wrote about the Badjao diaspora, emphasizing their lack of education and skills which pushed them to become street beggars. These two imperatives make this indigenous group susceptible as victims in the hands of merciless exploiters.

This study investigated if the Badjaos acclimate themselves to their community. Also, since they are easy prey in the hands of their perpetrators, the paper investigated if they have developed anomie with the folks in their community. It defines acculturation as acquiring the cultural aspects of a community by those who decide to stay in that community (Berry, 2003). The Badjaos speak a different language called Sinama; and, this becomes one of the reasons for ridiculing them. On the other hand, it is uncertain if acceptance in their chosen community is positive because of their uncanny way of dressing up and their naïve acts that make the community cringe. At this point, the folks in the community could either accept or reject them. This research investigated how the Badjaos are affected by being ridiculed, frowned upon, and the feeling of being unaccepted.

Another problem posed in this research is the question, ‘Were the Badjaos able to develop the feeling of anomie?’ The word anomie, as coined by Emile Durkheim, is both a linguistic and social term which this author asserts, is a societal symptom when the migrating group (who feels rejected and dejected) results from a breakdown of their standards and values or lack of purpose or ideals. It happens when rejection becomes intolerable because of the inability to speak the language of the community, or adapting to the culture of the people becomes difficult. A person affected by anomie may become an enemy of society by hating the people surrounding them or involving themselves in underworld activities as a form of revenge, and eventually becomes a menace to society.

Methodology

This paper employed the mixed-method research and used the sequential exploratory design type. The purpose of the methodology is to interpret qualitative and quantitative data into sequence of phases.

For the first phase that is qualitative task, a set of questions was prepared and used to interview the Badjaos. These interviews were gathered, analyzed, and interpreted. The researcher wanted them to describe the community and how they cope up despite the wide gap between their linguistic and social culture and the culture of the community. The researcher recorded their experiences utilizing an interview questionnaire. An informal interview was also conducted to the Facebook friends of the researcher by asking them several questions on their thoughts about these sea gypsies. The Honorable Councilor Maricel "Icel" Del Rosario Morales of Tanza gave credence to the research topic as she shared her thoughts about the Badjaos living in the Province of Cavite.

For the second phase that is quantitative task, the researcher asked 200 random people living in the community who answered the survey questionnaire voluntarily about the Badjaos. A simple random sampling was used for the participants who answered an open-ended questionnaire. The research employed inferential statistics to account for the participants' answers of the study. It used Mean, Standard Deviation, t-test, F-test, and Analysis of Variance (ANOVA) to interpret the viewpoint of the townsfolk about the Badjaos. To check further the effect size of the two variables concerned, the research used Cohen's d. In this statistical measure, the effect size could range from 2, 4, 6, or 8. The greater the effect size, the more significant the findings. The effect size is interpreted as small effect size (2-4), medium effect size (5-7), or big effect size (8).

The researcher observed ethical considerations during the conduct of the study. His junior staff introduced themselves in a very polite manner. They sought the head of the group, who gladly introduced himself as well. They explained the purpose of the meeting, and eventually, the Badjaos agreed. At the end of the interview, the team gave them a token of appreciation which they respected. Since none of them could read or write, the interviewers read to them the purpose of the interview, to which they all agreed.

Results and Discussions

1. Badjao Family's Interview

1.A. Profile

i) Age. The participant Badjaos do not know how old they are. They do not have documents or anything to prove their legal age. The father of the house looks like he is in his early 40s, while his wife looks like she is in her middle 30s. The eldest claims she was 18 years old, while the youngest said she was 16 years old. An extended member looks like he was in his mid-20s.

ii) Sex. There were two males and three females in the target family.

iii) Job. The father and mother were vendors selling anything there was to sell. The extended member said he begged for money in the streets of Tanza. Meanwhile, the two daughters just stayed in the house to do the household chores. Traditionally, however, the Badjaos are considered the best fishermen since this is their primary source of livelihood, aside from pearl diving (Valle, 2015). In Metro Manila, a typical Badjao owns a pedicab which happens to be their house as well. While the small children sleep in the pushcart, the teenagers and adults sleep in the streets. They own a thermos, a kerosene stove, plates, spoons and forks, glasses, pots and pans, some clothes and blankets kept in their pedicab (Soriano, undated).

The interviewed participants had a much better condition than the Manila Badjaos. Their simple apartment looked comfortable, although seven other families were living with them. The father said they all contribute to paying the house rent and other bills. The mother said that most of them solicit money in jeepneys, cars, and buses. The women sell anything in the market.

According to Jumala (2011), the Badjaos enjoyed peace and harmony back in their original abodes. They had fewer problems with their food, and it was easy for them to catch fish, eat cassava which is their staple, go out and pick all kinds of edible shells. If they have enough catch for the day, they go to the market and sell their crops and catch.

iv) Monthly income. The father of the house claimed that their average monthly pay ranged from \$57.34 to \$114.68 (or Php3,000 to Php6,000). However, this is questionable considering that they do not have stable jobs. In The Badjaos: Cast Away from Mindanao to Manila, Soriano (undated, bulatlat.com) reported that they earn at least Php200.00 (\$4.00) a day during lean months or as much as Php1000.00 (\$20) during peak season.

v) Language. Their language is a Central Badjao dialect called Siasi Sama of the Sama language of the Sulu archipelago. However, they also speak and understand Tausug and Bisaya, the lingua franca in the Sulu Province. According to the Badjao Language site (sinama.org), while all Badjaos are one in saying that their language is Sinama, but in the ethnolinguistics, as assessed by linguists, there are four different kinds of Sinama language: 1) Northern Sinama (Sinama Banguingui), 2) Central Sinama, 3) Western or Sinama Pangutaran, and 4) Southern Sinama (Schroeder, 2018). These variations have differences in vowel sounds, pronoun usage, language affixation, and vocabulary.

vi) Religion. The family's religion is Islam. However, some Badjaos are animists or ancestor worshippers. They call their god Tuhan in the Sinama language. According to the Joshua Project (joshuaproject.net), most Badjaos are Sunni Muslims of the Shafi School. Therefore, they believe in the Qur'an and the teachings of Mohammed.

1B) The host community (as perceived by the Badjaos)

The family mentioned that upon arriving in the community, the feeling of being unwelcomed slowly dawned on them. They said the people smirked at, laughed at, and looked at them with judgment on their faces. Some people call them by names and make fun of the way they dress. Others cover their nose into thinking that they are dirty, smelly, or not urbanized. They ask themselves why these people look down on them.

In these instances of the Badjao experience, a feeling of social uncertainty can come into view as they experience cultural stress. They mentioned several occasions when members of the community ridiculed them for the way they speak Tagalog. According to Lambert (1967), "the strongest dose of acculturation is experienced when linguistically, people begin to learn a language that is foreign to them (Brown, 1994). The frustrations, negativity, and feeling of isolation of the Badjaos are part of their culture shock (De Souza et al., 2016), and if these feelings continue, they could end up in anomie.

The Badjaos perceived their new place as ‘very different’ from their place of origin. When asked about the things that made Tanza different from Sulu, the very first thing that came to their mind was the use of technology. They said they could use cellphones or play in video houses. They have also adapted the everyday fashion of the Tagalog, like wearing shorts, t-shirts, sleeveless dresses, among others. They also added that they could go to malls or in big establishments which they do not have in their province. Finally, and most importantly, they have learned to speak Tagalog to communicate with people all the time.

1C) Description of the Badjao's linguistic culture

The Sama Dilaut participants revealed how they make their Sinama language exclusive among themselves.

i) At Home. They speak their Sinama language in their homes as this is the only place where they can freely express themselves as Sama Dilaut. When they speak their language in the open, they become attention-getters, as the community laughs at them.

ii) With friends or fellow Badjaos. Aside from family members, they also speak Sinama with fellow Badjaos, mostly in soft voices when they are with the group.

iii) In the community. When talking to the residents of the community and other people in the town, they try to speak Tagalog which, they are still learning. They learned how to use respectful words like "po" and "opo" which is absent in Sinama.

Based on their answers in the interview, the Sama Dilaut people are protective of their language and culture. They practice language exclusivity, although not using exclusively chosen words to conceal what they mean; but rather, they tend to use Sinama only among themselves. Aware of their identity as Sama Dilaut and their perceived uniqueness as an ethnic group, they tend to value their heritage by being reserved to the people in the community.

Being peace-loving and non-confrontational, they use Tagalog to avoid shame. However, according to them, people tend to laugh at them because they speak with an accent. The Sama Dilaut accent is noticeable since their L1 phonology (Sinama) interferes with the L2 (Tagalog). Using Selinker's interlanguage theory, the Badjaos' absence of Tagalog phonology in their dialect causes idiosyncrasy in their manner of speaking Tagalog. In this situation, accent discrimination comes into view, and again, no matter how the Badjaos attempt to blend with the host community, they will still receive harsh treatment from unwelcoming individuals. Accent discrimination was termed especially for people in the workplace. Also called accent bias, it prejudices especially those whose accent is not the norm in the workplace. But accent bias can also be applied in the community, and the Filipino's natural tendency to laugh at people with unusual accents affects groups like the Badjaos. According to the Equality and Human Rights Commission, accent bias can either be direct (treats a person with an accent directly) or indirect (discriminating a group with a protective character). In the case of the Badjaos, the bias can be both.

About their culture, the family explained that while most Tagalogs call them Badjao, they said they would better be called Sama Dilaut. They feel that the name Badjao belittles their character.

Their culture means a lot to them said the father of the house. They lived in a village on the seaside where a Panglima (leader) leads them. Their marriage is arranged, and the man who intends to marry gives dowry to the woman. They celebrate their wedding and marriage through Badjao dances and food. Another event important to them is the birth of a Badjao, which they consider a gift from Umbo Tuhan, their God or Allah. They also commemorate the dead and bury their dead according to Islamic law. They also believe that they are well-protected by their umbo (ancestors) wherever they go. According to ethnologists, Badjaos are nomadic people. It is one of the reasons why their children do not receive formal education. Most Badjaos are sea gypsies like the Sama Dilaut. They live in a village composed of houses built in shallow waters (Valle, 2015). Their native religion is a form of ancestor worship where they pray to their deceased family members. In fishing, for example, when they want an abundant catch, they offer cigarettes, special drinks, and food to their dead ancestors. They throw these offerings onto the sea after uttering a short prayer, as a belief that their ancestors will answer their prayers (De Jong, 2018). The participant family is Islam and follows the teachings of their Muslim leaders while practicing their Sama Dilaut culture as well.

1D) Reasons for living in the host community

The participants gave three reasons why they had to travel from their Sulu or Zamboanga domicile to the Tagalog province of Cavite: 1) The people in the community look down on them; 2) They are victims to the rebels (MILF, Abu Sayyaf, and the pirates of the sea); and, 3) They feel it is already dangerous to live in their natural domicile. The Badjao phenomenon has continued to shock every community in the country because of their sudden emergence and visibility in their adopted communities elsewhere. In Rappler Philippines article Plight of the Badjaos: forgotten, nameless, faceless, the writer lamented that the Badjaos are the most misunderstood and the most neglected of all indigenous or ethnic linguistic groups (Lagsa, 2015). According to the article, the Badjaos have a citizen issue and economic issue as well. These descriptions make them illegitimate in the Philippines.

One of the reasons for the discrimination is that they do not even know their identities – their birthday, and they also do not know how to write their name, their lack of formal education, or having no education at all. Communicating using Tagalog is only one of the many social problems of this group. This lack of the ability to speak in the lingua franca makes them exclusive to one another and isolated from the people around them. The Sama Dilaut people are peace-loving or non-confrontational. Their Muslim brothers mistook this as being cowardly in defending themselves; hence, they are abused and being dominated even by their tribe and by other tribes as well.

e) General public's perceptions about the Badjaos

The researcher gathered the public's views about the Badjaos and in sum, these are their general perceptions about this group of people:

a. The Badjaos do not know how to read and write.

b. These Badjaos who are moving to the cities are those who are victims of human trafficking and their abductors ask them to go to the streets to beg money for them.

c. They have no birth certificates; therefore, they have no country or a permanent place to consider their home.

d. They were made to believe that it is easy to find jobs in Metro Manila.

Some of those who answered the questions believe that the government needs to do something to help make them self-sufficient, educated, and urbane.

f) Interview with one of the town's leaders

The elected Honorable Councilor Maricel "Icel" Del Rosario Morales of Tanza shared her thoughts about the Badjaos by narrating her position about them. According to her:

'The Badjaos are one of the indigenous peoples from Mindanao. In my opinion, the way that they are perceived and treated by the society in general is a reflection of the inequality that our country's cultural groups are currently facing. The Badjaos who have migrated from the south to Luzon have been stereotyped and are often discriminated, rather than promoting the preservation of their ethnicity and making their contributions to our history known. If by the definition of marginalized group refers to the inability to exercise one's rights, deprived access to equal and fair justice, and the lack of representation or opportunity to be heard, then the Badjaos can be regarded as part of the marginalized sector. Because of the conflicts back in Mindanao, ethnic groups including the Badjaos, were forced to flee their villages and attempted to relocate in Metro Manila and here in the Southern Tagalog. It is also common knowledge that the Badjaos are known as "sea gypsies" with fishing as their main source of livelihood. It is possible that they sought places with coastal and fishing areas such as Tanza to be able to easily adapt to the living conditions. National government agencies (e. g. DSWD, NHA, and DOH) have long worked with the local government to implement interventions that aim to promote the welfare and support the needs of the Badjaos as part of the larger community. The Badjaos are neither menace nor a threat, and should not be excluded from the society. They too, yearn to be recognized—to be acknowledged. I believe that the community can benefit also by providing them opportunities where they can apply their skills and talents.'

2. The members of the community's perceptions of the Badjaos

The randomly selected 200 people in the community also gave their perceptions of the Badjaos based on the survey questionnaire that they answered.

a) Badjaos' presence in the community

Table 1 reveals the community's perceptions of the Badjaos on their presence in the community. Mean = 3.64 with a standard deviation (SD) = 0.34 where most of the participants "strongly agree" to four statements asked.

Table 1. Community's perception of the Badjaos' presence

Statement	Mean	Interpretation
Badjaos are illegal settlers	3.85	Strongly agree
Badjaos are faceless and nameless in the city	3.71	Strongly agree
Badjaos are a burden in the community	3.14	Strongly agree
Badjaos are very visible such that their numbers grow everyday	3.85	Strongly agree
Average Mean / Equivalent SD	3.64 / SD = 0.34	Strongly Agree

Table 2 reveals the community's perceptions of the Badjaos' personality. Mean = 2.64 with a standard deviation (SD) = 0.34 where most of the participants "agree" to four statements asked.

Table 2. Community's perception of the Badjaos' personality

Statement	Mean	Interpretation
Badjaos are sensitive to their surroundings	2.24	Disagree
Badjaos love to talk all the time.	2.70	Disagree
Badjaos are gifted and talented.	2.94	Agree
Badjaos are helpful.	2.26	Agree
Average Mean / Equivalent SD	2.64 / SD = 0.34	Agree

Table 3 reveals the community's perceptions of the Badjaos' lifestyle. Mean = 3.55 with a standard deviation (SD) = 0.43 where most of the participants "strongly agree" to four statements asked.

Table 3. Community's perception of Badjaos' lifestyle

Statement	Mean	Interpretation
Badjaos lack proper hygiene	2.94	Agree
Badjaos are uneducated.	3.85	Strongly Agree
Badjaos sleep in the streets.	3.57	Strongly Agree
Badjaos are beggars.	3.85	Strongly Agree
Average Mean / Equivalent SD	3.55 / SD = 0.43	Strongly Agree

Table 4 reveals the community's perceptions of the Badjaos attitude. Mean = 2.74 with a standard deviation (SD) = 0.25 where most of the participants "agree" to five statements asked.

Table 4. Community's perception of Badjaos' social attitude

Statement	Mean	Interpretation
Badjaos are respectful to those who give them alms	2.94	Disagree
Badjaos are aggressive	2.91	Agree
Badjaos will hurt you if you do not give them money.	2.47	Disagree
Badjaos are friendly if you approach them kindly	2.91	Agree
Badjaos are very polite in asking questions	2.46	Disagree
Average Mean / Equivalent SD	**2.74 / SD = 0.25**	**Agree**

Testing Badjaos' social attitude over their presence in the community, a two-tailed t-test showed that t = -4.61 using 7 degrees of freedom, while p-value = 0.002454 showing a significance at $p<0.05$. Therefore, the null hypothesis that says there is no significant effect of the Badjao's attitude over their presence in the community is rejected. Using Cohen's d to further check the significance of the effect size of the findings, Cohen's d = 3.01596, indicating a small effect size between the two variables which means that the result of the correlation between the two is only slightly significant. It means that the Badjaos' attitude is slightly significant over their presence in the community.

Correlations of the variables

Personality and their presence in the community

In correlating the Badjaos' personality over their presence in the community, the result of the two-tailed test shows that t = -3.7023 using 6 degrees of freedom, while p-value = 0.010061, which means that the findings are significant at $p<0.05$. There is a significant effect of the Badjao's personality over their presence in the community. Therefore, the null hypothesis that says there is no significance between the Badjao's personality on their presence in the community is rejected. Testing further the effect size of the findings using Cohen's d, the calculated effect size of the two variables shows that d = 2.932539. Therefore, there is a small effect size between the two variables which means that the result of the correlation between the two is only slightly significant. Thus, it can be said that Badjao's personality is not that noticeable or if it is, then, it is not that meaningful to the people in the adopted community.

Lifestyle and their presence in the community

In correlating Badjaos' lifestyle over their presence in the community, results of the two-tailed test show that t = -3.1115 using 6 degrees of freedom, while p-value = 0.766216 which shows a non-significance at $p<0.05$. Therefore, the null hypothesis that says there is no significant effect of the Badjao's lifestyle over their presence in the community is accepted.

Attitude and their presence in the community

Testing Badjaos' attitude over their presence in the community, a two-tailed t-test showed that t = -4.61 using 7 degrees of freedom, while p-value = 0.002454 showing a significance at $p<0.05$. Therefore, the null hypothesis that says there is no significant effect of the Badjao's attitude over their presence in the community is rejected. Using Cohen's d to further check the significance of the effect size of the findings, Cohen's d = 3.01596, indicating a small effect size between the two variables which means that the result of the correlation between the two is only slightly significant. It means that the Badjaos' attitude is slightly significant over their presence in the community.

Personality and their lifestyle

In testing the Badjaos' personality over their lifestyle, a two-tailed t-test showed that $t = -3.7023$ using 6 degrees of freedom, while p-value = 0.010061 showing a significance at $p<0.05$. Therefore, the null hypothesis that says there is no significant effect of the Badjaos' personality over their lifestyle is rejected. To test the effect size of the significance further, Cohen's $d = 2.347654$ which means that the effect size of the significance is just small. While the Badjaos' personality affects their lifestyle, the effect is slightly noticeable.

Personality and their attitude

Proving the Badjaos' personality in connection to their attitude, a two-tailed t-test showed that $t = -1.03$ using 7 degrees of freedom, while p-value = 0.336811 showing non-significance at $p<0.05$. Therefore, the null hypothesis that says there is no significant effect of the Badjaos' personality over their attitude is accepted. This means that the Badjaos possess humility which is a positive outcome. On the other hand, this low-key attitude will not do them any good since there is always that tendency to be victimized by the menaces of society.

Badjaos' lifestyle and their attitude

Proving the Badjaos' lifestyle over their attitude, the two-tailed test showed that $t = 3.59$ using 7 degrees of freedom, while p-value = 0.008879 shows a significant effect of their lifestyle at $p<0.05$. Therefore, the null hypothesis that says there is no significant effect of the Badjaos' lifestyle over their attitude is rejected. It confirms the low-level lifestyle of the Badjaos that is evident in their everyday life challenges in their adopted community.

The community's total perception of the Badjaos' presence, personality, lifestyle, and attitude

Using one-way ANOVA to find out the total perception of the community over the Badjaos' presence in their town, personality, lifestyle, and attitude, results showed that F-statistic value = 11.29549 using 16 degrees of freedom, where p-value = 0.00063 at $p<0.05$. It means there is a significant effect of the community's total perception over the Badjaos' presence in their area. The null hypothesis that says there is no significant effect of the community's total perception over the Badjaos' presence, personality, lifestyle, and attitude is rejected. This result corroborates with the interview conducted with this group of indigenous people.

Conclusion and Recommendations

In sum, the findings showed the Badjaos' visibility in the community that which the people reject. The people agree that the Badjaos are gifted, talented, and helpful, but negate their insensitiveness and lack of polished attitude.

There are two main points of the study – find out how they acculturate themselves to the community; and second, find out if, in the course of acculturation, there was anomie that visibly happened as the effect of the people's non-acceptance of them.

In terms of acculturation, it was clear that the Sama-Dilauts (Badjaos) tried to accustom themselves to the community. However, they felt rejected, scoffed at, and made a laughing stock all the time. The community thinks that they are peaceful but also perceives them as somebody who could hurt people if they are not given what they want like money. According to the native respondents of the community, they strongly agree that the Badjaos are an eyesore in the community; yet, they agree that the Badjaos are not a threat to peace and order. In regards to their lifestyle, the community strongly agrees on the negative routine of the Badjaos – begging in the streets, making the streets their playground, or lacking proper hygiene. Finally, on their social attitude, the community believes that the Badjaos are peace-loving people, except they are misunderstood because of their manner of speaking (which is different from the accent of the Tagalogs.). The last concern can then be considered cultural disagreement between the two cultures. Overall, there is a significant effect of the Sama-Dilauts' presence in the community. The result means that the Badjaos are noticeable everywhere and the community is affected negatively by their presence.

Merton's Strain (anomie) Theory can be visible with the Sama Dilaut people on a case-to-case basis. For all their experiences trying to build good relationships with the members of the society, still, they have this social uncertainty because the people everywhere are displeased with their presence. It is clear in the findings that while the people believe that the Badjaos are peace-loving people, they also believe that this group can be harmful in other ways.

With the substantiated results of the interview and the statistical findings, this study recommends the following:

1) That the local government visibly show public concern to the Badjaos by encouraging them to enroll in an alternative learning system (ALS), teaching them how to dress properly, and introducing them to hygiene and grooming;

2) That there will be a formal recognition of their presence in the community where they can freely introduce their culture;

3) That the local government or the non-government organizations (NGO) sponsor various livelihood programs that will give them a decent life;

4) That the local government considers establishing an office for indigenous peoples as one of their long-term development plans, not only for the Badjaos but for other minorities seeking residence in the community; and finally,

5. That the Badjaos' Filipino identity be established by producing for them legal papers that will clearly recognize them as people belonging to a definite country, and not as gypsies who roam from place to place without any dignity that they can be proud of.

Acknowledgments

The author is thankful to his former students in Tanza Campus – Noreen B. Alivia, Edilyn L. Alvarez, Christine Jewel R. Gallos, Joanna Lei P. Lapig, Ramesis F. Macabenta, and Bernard E. Pante for allowing him (as their adviser and mentor) to duplicate and improve this classroom project into a full-blown research.

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Exploring Motives and Barriers to Exercise among "At-risk and Obese" Filipino College Students

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Abstract - Exercise is a critical component of physical activity that has been a trend and a challenge to many educational institutions. The steadfast increase in the percentage of obesity in the world was even heightened due to the coronavirus disease (COVID)-19 pandemic. With these in mind, the researchers aimed to explore the perceived motives and barriers to exercise among "at-risk and obese" Filipino college students using the free-listing methodology. This quantitative-descriptive study considered 355 purposively selected students from a comprehensive state university in Pampanga, Philippines, who were categorized above their normal body mass indices. Responses in the free list were coded using the subscales of the Exercise Motivation Inventory-2 (Mullan et al., 1997) for the motives, while the subscales of Myers and Roth (1997) were adopted for barriers. It was found out that most of the subscales from EMI-2 that involve motives to exercise are still apparent in the present day. The motives indicated in the results were primarily health-related and for self-satisfactory causes. On the other hand, most of the barriers identified in the 1997 subscales were still relevant and evidenced in the contemporary time, even amid a global health concern since most of them were still identified concerning the listed responses. Furthermore, emerging motives and barriers were also discussed in the study. The results provided clear-cut inputs for educational institutions to facilitate the development of exercise programs that are adherent to what motivates the students and reconsider potential hurdles that may impede such physical activity participation.

Keywords - exercise motivation, free-listing methodology, obesity, physical activity, physical education

Introduction

The coronavirus outbreak was first detected in Wuhan, China, in December 2019. The Corona Virus Disease (COVID)-19 pandemic has posed unprecedented challenges in the global economy (Ozili & Arun, 2020), health departments (Harnett et al., 2020), and the education sector (Onyema et al., 2020).

Since many learners are now pursuing their education at home, they have less motivation to perform more physical activities than what they practiced before the pandemic started. During the pre-pandemic period, learners have been performing a lot of physical activities in their respective schools, especially during Physical Education (PE) classes, given that the nature of PE consists of various physical activities. However, because of the widespread virus, there was a sudden halt in the physical activity (PA) participation of the learners since they are strictly advised to abide by the law and stay inside their houses.

Doctors and other medical and health agencies announced that COVID-19 has no cure yet (Godman et al., 2020). Performing physical activities is a massive help in keeping a good physique and helps to improve holistic health (Rawat et al., 2020). According to Laddu et al. (2020), regular physical activities through moderate-intensity physical exercises can prevent viral infections and enhance immune support. Physical activity is not the absolute cure to COVID-19, but it can minimize the chances of acquiring it. Being physically active contributes to one's physical and mental health (Callow et al. 2020). Regular engagement in physical activity is a great way to enhance physical health and emotional and mental aspects (Callow et al., 2020). Engaging oneself in physical activities, work out, and exercises have been proven to be positively seen as an intervention for mental health problems such as anxiety, stress, and depression (Mattioli et al., 2020). It was revealed in a study conducted by Brand et al. (2020) that those who actively engage themselves in physical exercises during the pandemic have more positive mood states and outlooks than those of their inactive counterparts.

Status of Overweight and Obesity in the World

Feeding practices and eating habits contribute to obesity (Peltzer & Pengpid, 2017; Lindsay et al., 2017). A study among university students conducted across eight Association of Southeast Asian Nations (ASEAN) countries found that sedentary lifestyle and physical inactivity are not the main factors contributing to obesity, but the specific dietary behavior of people (Peltzer & Pengpid, 2017). Hence, the study proves that physical inactivity is not always associated with obesity, but it is about the appropriate dietary habits. In addition, unhealthy feeding practices and improper eating behavior can increase the risk of being obese (Lindsay et al., 2017).

Thailand conducted a research tracking obesity and nutrition (Nonboonyawat et al., 2019). Hence, Thailand's focal point of the policies in obesity research focuses on food and PA education (Teerawattananon & Luz, 2017). On the other hand, the ubiquity of obese and overweight among Thai students was also high because of the amount of time spent in sedentary activities such as watching television for several hours and playing video games (Nonboonyawat et al., 2019).

Status of Overweight and Obesity in the Philippines

The performance of children in doing PA is a significant factor in their fitness level. It shows that the lesser the engagement to such PA, the more prone and “at-risk” to being regarded as obese or overweight. In a study conducted by Peltzer et al. (2014), it has been revealed that in the Philippines, there have been a high number of university students who are overweight or obese.

In 2015, a study conducted in Iloilo City revealed that sex, educational level, level of PA, food intake, alcohol and smoking habits, weekly allowance, and some obese family members are the identified factors contributing to obesity among adolescent women (Abello, 2015). The same study also stated that the status of obesity and eating practices are viewed as barriers to forestalling obesity.

Barriers to Exercise from Various Perspectives

Physical activity and exercise bring a lot of health benefits to people. It helps in strengthening a person’s immune system which will serve as a weapon against any disease, rewards people with good physical appearance, and develops confidence. Despite these positive health benefits, other people tend to practice sedentary behaviors and possess physical inactivity because of some barriers that affect their willingness to engage in physical activities. Baert et al. (2011) reported that the barriers to physical activity among adults are composed of various intrapersonal factors. In the same study, intrapersonal barriers have been identified as physical impairment, lack of time, tiredness, lack of motivation, unfamiliarity with exercise procedures, and lack of interest. Relatively, the same factors were also revealed in the study conducted by Moreno and Johnston [17] but gave stress to women’s participation in PA. The PA participation among women is more likely to be less prevalent as compared to their male counterparts, mainly due to barriers such as lack of time, predicted lack of enjoyment, and self-consciousness (Moreno & Johnston, 2014).

In a study conducted by Hoare et al. (2017), it was found out that more than 22% of the respondents have been reported to be identified under the inactive group, which means that they are doing very little PA every day. These respondents from the inactive group have identified barriers that hinder them from physical activity while recognizing exercise to bring a lot of health benefits to people. It helps in strengthening a person's immune system, which will serve as a weapon against any diseases, rewards people with good physical appearance, and develops confidence within. But despite these positive health benefits, other people tend to practice sedentary behaviors and possess physical inactivity because of some barriers that affect their willingness to engage in physical activities. Baert et al. (2011) reported that the barriers to physical activity among adults are composed of various intrapersonal factors. In the same study, intrapersonal barriers have been identified as physical impairment, lack of time, tiredness, lack of motivation, unfamiliarity with exercise procedures, and lack of interest. The same factors were also revealed in the study conducted by Moreno and Johnston (2014) but gave stress to women's participation in PA. Physical activity participation among women is more likely to be less prevalent than their male counterparts, mainly due to barriers such as lack of time, predicted lack of enjoyment, and self-consciousness (Moreno & Johnston, 2014).

Motives to Exercise from Various Perspectives

Hindrances and challenges may always be present in participating in different PAs, but there are still motivating factors that can be referred upon. Sibley et al. (2013) suggested that the motives for exercising and engaging in PAs depend on the participant's desired outcomes. It emphasized that when intrinsic motivation and competence-related motives were firm and being instilled in the mind and heart of the participant, the more influential the results will be (Sibley et al. 2013). Aaltonen et al. (2014) acknowledged that the primary motivating factor for adults is their desire to achieve good health. In the same study, it was also reported that aside from recognizing health as a key factor for motivation, it was also found out that consciousness to physical appearance, interest, and body image are also viewed as motivating factors (Aaltonen et al. 2014). Firth et al. (2016) argued that socio-ecological factors are also identified to be critical factors that motivate people to engage in various vigorous exercises.

It has been stressed in the study conducted by Zelenskyi and Zelenskyi (2018) that the predominant motive of female college students was their aspiration to have a good body shape, lose weight, and achieve a healthy body. Meanwhile, Zhou et al. (2020) reported that among their respondents who are actively participating in PAs through sports, they have discovered that the prevailing motives for them to engage actively in PAs are mastery of the skills in playing the sport, health consciousness, maintaining a good physique, and their ego as competitive individuals. The desire to acquire a good physical appearance and the desire to please the public is also identified as a significant motive in PA participation among older men and women (Aaltonen et al., 2020). In the study of Cagas et al. (2014), given the low number of Filipinos who regularly engage in health-promoting physical activity, determining which exercise participation motivations are especially important to Filipinos may provide helpful information for physical activity promotion.

Status of Physical Activity Participation in the Philippines

Filipino students are being encouraged to actively participate in different physical activities considering that the PE subject is integral in the school curriculum. Physical activities are also observed in Philippine society like holding sports events held at the barangay to municipality levels or even up to national league events and competitions (Akiyama, 2018).

The most frequent reasons to exercise identified by the Filipinos were to be strong and sexy, and the most stated motive is to lose weight (Cagas et al., 2014). With that, it was clear that most Filipinos are conscious of their physical appearance. On the other hand, a study in the Asia-Pacific region showed that Filipinos engaged in physical activity to prevent non-communicable diseases (NCDs) (Macniven et al., 2012). Thus, Filipinos who are involved in physical activities planned to have an excellent physical appearance and to prevent NCDs. Some students live a sedentary lifestyle (Peterson et al., 2018). Meanwhile, Tolentino (2018) confirmed that physical condition was the primary reason why Filipino physical education majors undertake physical activities.

The Philippines is one of the countries that are most likely to be active in social media. Many Filipinos spend their time scrolling and browsing on social media, which is mainly why they are physically inactive. Currently, the TikTok application is one of the trending and most visited sites worldwide because of its features. In this pandemic, many Filipinos are using this application to have fun and learn something new (Escamilla-Fajardo, 2021). In addition, the trending China-owned application has been a new way of exercising and has helped Filipinos to be physically active and engage in activities such as dance challenges and dance face-offs, which can also be referred to as simple forms of physical activity participation. Home workout tutorials, calisthenics, and other exercise or sports training and skills improvement can also be found in the TikTok application. In this way, Filipinos, though isolated and quarantined in their houses, can still practice active living, and break a sweat every day.

While most studies cantered on apparently healthy individuals and from a general population, there is a need to explore motives and barriers from the perspective of an understudied group such as the "at-risk and obese" students. Also, given the unfortunate circumstances brought by the pandemic, giving attention to exploring the barriers and motives of Filipino college students from such groups would be of great help to the field of research in physical education and the students who can be affected by this. With that, the study determined the barriers and motives of the “at-risk and obese” students from a particular public institution of higher learning in the Philippines. This may potentially serve as a benchmark to prepare fitness programs instituted by PE practitioners and fitness experts, even during a pandemic.

Objectives of the Study

The researchers aimed to explore and investigate the perceived motives and barriers to participating in exercise among “at-risk and obese” Filipino college students using the free-listing methodology.

1. How may the listed motives for exercise, as identified by the participants, be categorized according to the subscales of the Exercise Motivation Inventory - 2 (Mullan et al., 1997)?

2. How may the listed barriers to exercise be categorized using the subscales of Myers and Roth (1997)?

Methodology

Research Design

This study used the Free Listing Method, a method in which the respondents can reflect upon their ideas and list assumptions about a specific category based on their understanding, experience, and knowledge. They can refer to some domains or factors that are sometimes being omitted in an open-ended questionnaire. Through this method, the respondents can freely express their perceptions and ideas about a specific field, providing answers and results with sincerity and authenticity (Quinlan, 2019). This design was useful to capture the identified motives and barriers as perceived by the respondents since this would also apprehend other aspects beyond the identified various subscales and potentially establish culture-associated factors, including the timely context of the pandemic.

Respondents

The respondents of the study included Filipino college students who are enrolled in Physical Education (PE) courses, PE 2 "Exercise-based Fitness Activities" for first-year students, and PE 4 Menu of Physical Activities for second-year students during the Second Semester of Academic Year 2020-2021 from the Institute of Physical Education (IPE) System of a public comprehensive university in the Province of Pampanga, Philippines. Employing the use of the purposive sampling technique, participants were selected according to their ability to explain and explicate factors in a specific category, theme, or phenomenon (Robinson, 2014). To qualify as a respondent, the student (either male or female), through their body mass indices (BMI), must be specifically categorized as "at-risk" (BMI ranges from 23 to 24.9 kg/m2), "Obese I" (25 to 29.9 kg/m2), and "Obese II" (above 30 kg/m2) according to the Philippine Association for the Study of Overweight and Obesity (PASOO) (2020). Data were facilitated through the faculty members of the Institute subject to data privacy procedures and ethical compliances. Such interpretation may be of use for individuals 16 years old and above (PASOO, 2020). In this study, although there were three categories considered when BMI was interpreted, they were collectively taken as one group of subsamples for further analysis.

In this study, 355 qualified student-respondents from different colleges and campuses, ranging in age from 18 to 39 years old, participated. The sample was composed of males (n = 136) and females (n = 219) with a mean age of 19.80 years old (± 1.83), a mean height of 1.64 meters (± 0.10), and a mean weight of 165.02 lbs. (± 30.44). The sample group had an average BMI of 27.79 (± 4.76). Also, there were 105 (29.58%) participants categorized as "at-risk," 171 (48.17%) were Obese Level I, and 78 (21.97%) were Obese Level II. Based on the data, 219 (61.69%) of them reported that they were currently exercising, while 136 (38.31%) identified themselves as non-exerciser.

Instrument

The first part of the instrument included questions about the demographic characteristics of the respondents to provide a demographic view of the sample. This included their age, sex, height, weight, and computed BMI. They were also asked the question: “Ikaw ba ay kasalukuyang nag-eehersisyo?” (Do you currently exercise?) to provide general information on the status of their participation in exercise.
The second part of the survey includes open-ended questions, which were content validated by five experts. The pool of expert validators included a professor of physical education, two (2) nurse educators, a language expert, and a registered psychometrician. The computed item-content validity indices of the questions were at 1.00, indicating their high extent of validity (Lynn, 1986).

Data-Gathering Procedures

Permission from the Director of IPE was obtained via electronic mail correspondence to allow the researchers to gather information from their students enrolled in PE classes who met the inclusion criteria set and subsequently got information from the PE teachers. In identifying the students who qualified to the set criteria, an email was sent to all PE teachers of the IPE System to generate information on the number of students identified as "at-risk or obese" as per PASOO (2020) standards. The open-ended questions were requested to be forwarded to the students who qualified for the criteria through their respective PE teachers and were willing to participate in the study. Participants were given a week to complete the online survey, and follow-up was done with teachers.

Since the open-ended free-listing method was employed in this study, as it was justified to be of use in identifying the reasons or hurdles to exercise among college students (Cagas et al., 2010; Ebben & Brudzynski, 2008), this identified the contemporary motives and barriers to participating in an exercise from the perspective of “at-risk and obese”-categorized students.

Analysis of Data

The data that was collected from the open-ended questions of the free-listing methodology on the possible reasons why they or they do not participate in exercise were coded independently by the first and second authors. The first and the second authors categorized the answers by independently coding them one by one using the fourteen subscales of EMI-2 of Mullan et al. (1997) for the motives and the subscales of Myers and Roth (1997) for barriers. The coding process and inter-coder agreement procedures were performed using MAXQDA version 2020.4.1. If the first and second authors have conflicts or discrepancies in the codes, the third author resolved the conflicts.

Ethical Considerations

Several ethical standards bound the procedures of obtaining data from the participants in the conduct of research, such as the Belmont Report (1979) and the Data Privacy Act of 2012. National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1979) for one, considers three core principles of ethics in research involving human participants such as "respect for others, beneficence, and justice."

Results and Discussions

Motives to Exercise

A total of 458 responses for motives were collected from the sample of college students categorized as "at-risk and obese" based on their BMI. These were further categorized and coded using the subscales of the Exercise Motivation Inventory (EMI)-2 of Mullan et al. (1997) with an inter-coder agreement of 37.02% between the first and second authors. The third author, who specialized in physical education and human movement sciences, settled the disagreements.

Out of 458 responses for motives, 65.72% of them were categorized within the themes provided by Mullan et al. (1997). It could be surmised in Table 1 that "positive health" was the most identified reason for the respondents to exercise, as this constitutes a little more than a quarter of the total responses (32.23%). This result means that they consider physical activity as essential to maintaining good health. This may also be associated with the study's situation during a pandemic; hence, sustaining one's good health is of utmost concern. This further implies that exercise is vital in times of a global health issue (Brand et al., 2020).

Exercise among categorized "at-risk and obese" respondents also identified "weight management" (25.58%) as a second mostly identified motive. The respondents considered losing weight as one of the main reasons why they engage themselves to exercise as it also contributes to their wellness and the improvement of their health (Sairanen et al., 2014) Moreover, since “appearance” (20.27%) also emerged as a prevailing motive, most of the respondents' main concern is their physical attributes. Their looks may also be highly considered as a reason for them to exercise. It can be associated with how society, particularly in the Philippines, consider being sexy as a primary motive to exercise (Cagas et al., 2014). This may further imply that exercise frequency has a positive association with the dimensions of positive body image, and appearance-based exercise is one of the motivations that can help increase such correlation (Homan & Tylka, 2014).

Table 1. Summary of Motives for Exercise (coded using EMI-2 subscales of Mullan et al., 1997)

Theme	*f*	%	Sample Responses
Positive Health	97	32.23	“to be healthy”
Weight Management	77	25.58	“*magbawas ng timban*g” (to lose weight)
Appearance	61	20.27	“*masuot ang gusto kong damit*” (to wear the clothes I want)
Ill-Health Avoidance	19	6.31	“It lessens the risk of health problems”
Strength and Endurance	16	5.32	“*para lumakas ang pangangatawan*” (to make my body strong)
Affiliation	10	3.32	“Doing it with somebody, I need a workout buddy because I'm lazy whenever I do it alone”
Stress Management	5	1.66	“release stress”
Health Pressures	5	1.66	“if a doctor tells me to”
Competition	4	1.33	“to be sporty and athletic”
Revitalization	3	1.00	“*para maging masigla*” (to become lively)
Enjoyment	2	0.66	“*...masaya ako kapag pinagpapawisan ako*” (I feel happy when I’m perspiring)
Nimbleness	2	0.66	“*para makagalaw ng maayos*” (to move easily)
Challenge	0	0.00	-
Social Recognition	0	0.00	-
Total	301	100	-

Other Motives

Apart from the themes provided by the EMI-2 of Mullan et al. (1997), emerging motives appeared after analyzing the responses. In fact, 156 out of 458 responses (34.06%) from the qualified student-respondents were considered as emerging motives. Five (5) of these were adopted from Cagas et al. (2010), particularly on “requirement” (7.69%), “leisure” (6.41%), “athletic goals” (1.92%), “lifestyle” (9.62%), and “social influence” (7.69%). However, the most frequently identified “other” motive to exercise was “general fitness” (40.38%). “Personal” reason, as a motive, garnered the second-highest frequency (22.44%) since most of the responses were about being confident and avoiding body shaming.

Additional motives were revealed by the student-respondents such as the “materials” they use in performing an exercise. It can be associated with the student-respondents’ current BMI and having a hard time doing calisthenics exercises (Nordin & Zainuddin, 2016). It appears that some of the student-participants are depending on their quality of exercise to the usage of the exercise materials or equipment

(Chow, 2013). Another emerging motive is "athletic goals" but only has a minimal response. The results further indicate that some students exercise because they are athletes and therefore, keep and maintain their exercise participation (Reifsteck & Brooks, 2018). The last identified emerging motive is the "pandemic" which only has a single response. Thus, it can be assumed that even if we are facing a global pandemic, it is still feasible to exercise and not limit our capabilities (Brand et al., 2020).

Table 2. Summary of Other Motives for Exercise

Theme	*f*	%	Sample Responses
General Fitness	63	40.38	"to be fit"
Personal	35	22.44	"To boost self-confidence to avoid body-shaming on my self "
Lifestyle	15	9.62	"I want to improve my way of living"
Requirement	12	7.69	"Requirement in school /PE"
Social Influence	12	7.69	"*Mga taong nakikita ko na may progress/result sa pag exercise na ginagawa nila*" (Seeing the progress and results of people who exercise)
Leisure	10	6.41	"*upang makapag palipas oras*" (To spend spare time)
Materials	5	3.21	"materials sa pag-eehersisyo (Materials used in exercising)"
Athletic Goals	3	1.92	"athlete"
Pandemic	1	0.64	"I want to take care of myself, especially this time of the pandemic"
Total	156	100	-

Barriers to Exercise

From the list of responses, 448 responses were gathered and qualified as barriers from the student-respondents. These data were categorized and coded using the subscales of the barrier factors identified by Myers and Roth (1997) with an inter-coder agreement of 62.41% between the first and second authors. The remaining 37.59% are disagreements and were settled by the third author.

A total of 388 out of 448 responses (86.61%), were categorized within the themes provided by Myers and Roth (1997). Table 3 depicts the summary results of the frequency distribution and percentage of the barriers to exercise. It appears that most of the respondents are not that concerned with their health because of laziness. More than a quarter of the total responses (27.32%) constitute the subtheme "too lazy" as a barrier to exercise. This is consistent with the study of Myers and Roth (1997).

Some of them also think that what impedes them from exercising is because they do not have enough time (19.59%), which interferes with their school-related activities (19.07%). This could mean that doing exercise would require much of their time, and it may not be their priority. Students having "not enough time" to perform an exercise can be associated with their busy school schedules, work, or other activities that prevent them from exercising (Hoare, 2017). Given that the respondents are college students, having a heavy school workload and busy academic schedule is also a factor for them not to exercise.

Table 3. Summary of Barriers to Exercise (adopted subscales from Myers & Roth, 1997)

Theme	*f*	%	Sample Responses
Too lazy	106	27.32	*"katamaran sa pag-eehersisyo"* (laziness to exercise)
Not enough time	76	19.59	"time management"
Interferes with school	74	19.07	"*busy sa school works"* (busy in school works)
Medical problems	23	5.93	"having an asthma"
Family obligations	22	5.67	"*maraming gawain sa bahay"* (too much household chores)
Interferes with work	21	5.41	"*pagkabusy sa trabaho*" (busy at work)

Takes too much discipline	14	3.61	"consistency doing workouts and exercise"
No convenient places	12	3.09	"*not enough space to workout*"
Too tired	10	2.58	"lack of energy"
Too inconvenient	9	2.32	"lack of materials"
Too much work	5	1.29	"too much work and things that I need to prioritize first"
Uncomfortable	5	1.29	"*dahil sobra sa timbang*" (because of excessive weight)
Bad weather	3	0.77	"*sikat ng araw"* (sunlight)
Interferes with social life	3	0.77	"*laging umaalis"* (always leaving)
Family does not encourage	2	0.52	"family matters"
Get hot and sweaty	1	0.26	"*di pinapawisan"* (does not perspire)
Too fatigued	1	0.26	"I feel extreme fatigue whenever I do"
Don't like to exercise alone	1	0.26	"*walang kasama mag work out"* (no one to work out with)
Too boring	0	0.00	-
Look silly	0	0.00	-
Causes sore muscles	0	0.00	-
Too uncoordinated	0	0.00	-
Friends do not exercise	0	0.00	-
Total	388	100	-

Other Barriers

Apart from the themes provided by Myers and Roth (1997), other emerging responses constitute additional themes. Twenty-five percent (25%) of the responses identified that eating their favorite food is a leading barrier to do exercise. Moreover, the increasing number of COVID-19 cases determined the emergence of the "pandemic" as another barrier (23.33%). These were followed by "personal" barriers constituting 15% of the total coded responses. Other barriers among "at-risk" and obese students were identified in undertaking "online games". Unsurprisingly, they may spend the entire day or night playing internet games. The loss of interest in exercise is one of the most serious of these issues. Instead of exercising, they are more interested in playing online games (Hazar & Hazar, 2018).

Female student-participants who have "menstruation" may lead to "mood" swings as the emerging theme of barriers in exercise. This means that females are more prone to be sedentary in exercising throughout their menstrual cycle. Increases in stress hormones because of negative emotions can worsen feelings or mood that can affect decision-making, such as increased tolerance and interest in a long-term activity routine, such as not engaging in physical exercise (Prado et al., 2021).

As a result of using social media, individuals are "being criticized," such as receiving negative feedback through comments, which is considered an emerging barrier to participating in any exercise. The last barrier as per the student-respondents is the "mobile device." However, they are unaware that excessive cell phone use has negative effects such as sedentary behaviors that can interfere with exercise and that a high level of use can contribute to a larger problem of leisure time sedentary behaviors such as the "sit and play" that makes people more likely to become obese. This is because while using mobile devices, people were twice as likely to consume more sugary drinks, fast food, and sweets, and snacks, thereby resulting in a minimized drive to exercise (Lepp et al., 2013; Barkley & Lepp, 2016).

Table 4. Summary of Other Barriers to Exercise

Theme	*f*	%	Sample Responses
Food	15	25.00	*"Mga paborito kong pagkain"* (my favorite foods)
Pandemic	14	23.33	"growing covid cases"
Personal	9	15.00	*"Maraming pong pinagkakaabalahan"* (too much preoccupation)
Online Games	6	10.00	"video games"
Menstruation	4	6.67	"monthly period"
Mood	4	6.67	*"Depende sa mood ko"* (depends on my mood)
Social Media	3	5.00	"I'm distracted by social media/ internet"
Being Criticized	3	5.00	"Negative feedbacks from other people"
Mobile Device	2	3.33	*"pagce-cellphone"* (using cellphone)
Total	60	100	-

Conclusion and Recommendations

Conclusion

Most of the subscales from EMI-2 of Mullan et al. (1997) that involve motives to exercise are still apparent in the present-day times despite the more than a decade gap of both studies. Also, most of the barriers identified in the 1997 subscales were still relevant and evidenced in the contemporary time, even amid a global health concern, since most of them were still identified in the listed responses. The other barriers that emerged were deeply rooted within the context of the respondents who were categorized as "at-risk and obese" students, attending classes online, and mostly limit their interaction within a virtual setting.

Most of the respondents are too lazy and have insufficient time to exercise, which may interfere with their school-related activities. Some of them consider medical issues, including their family and home responsibilities as hindrances to exercise.

It is noteworthy that within the context of the respondents, a considerable number of them perceive their love for food as an emerging barrier, while some of them took the pandemic as a remarkable hindrance to being active. Moreover, many of them have personal reasons that inhibit their physical activity participation, like exercise. Also, female respondents cited menstruation as a burden to undertake exercises. Lastly, since the pandemic started, a notable reason not to exercise was also attributed to their preference to play online games instead, thereby limiting, if not stopping, themselves from actively participating due to its passive nature.

Limitations of the Study

The study dealt with the acquisition of a free list from each respondent on why they exercise or not. However, it did not further investigate the underlying reasons of each motive or barrier as the inferences were justified merely by local and foreign-related literature. The relatively low inter-coder agreements for both motives and barriers can be attributed to the seemingly vague responses, which may be perceived differently by the first and second authors. Although the third author had established the discrepancies, the consensus was not fully achieved to strengthen the claims thoroughly. The respondents only involved college students with PE subjects who were on their first- and second-year only.

Recommendations

Considering that health reason was confirmed to be a top motivator for the students to participate in an exercise, it is recommended that physical education teachers, specifically at the collegiate level, further emphasize the integration of health concepts and the impact of exercise on the body in its various dimensions. Presentation of relevant and current research about how exercise improves an individual whose BMI is above the normal in the content of their lessons is also encouraged.

Since the study results were focused on the lower college year levels, it is recommended that future researchers consider the higher year level as respondents.

Given the country's current situation experiencing a global health crisis, putting healthy habits and practices into consideration is very important. It is recommended for physical educators to integrate and provide more engaging physical activities for the students to improve their physical fitness.

Acknowledgment

The authors would like to express their profound and sincerest gratitude to the Department of Physical Education, College of Education of the Don Honorio Ventura State University (DHVSU), specifically to Dr. Riza B. Lintag, Dr. Jumel C. Miller, Dr. Rommel C. Rivera, and Mr. Rolan Randolf I. Garcia for the extended support toward the enhancement of this paper. Also, the authors are immensely grateful to the faculty members of the DHVSU Institute of Physical Education for assisting them in the data-gathering procedures of the study.

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Personality Traits, Coping Strategies, And Academic Motivation among High-Achieving College Students amidst Covid-19 Pandemic

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Abstract - This study aims to see the effect of Personality traits on the Academic Motivation mediated by Coping Strategies among High-achieving College students during the course of COVID-19 pandemic. A total of 281 President's and Dean's List students volunteered to participate in the study. Respondents were asked to answer a brief demographic profile and three standardized tests namely: Big Five Personality Inventory-44 (BFI-44), Brief-COPE, and Academic Motivation Scale (AMS-28). Data gathered were analyzed through the SPSS Analysis of Variance (ANOVA) and Path Analysis for interpretation. Results showed a significant difference on Neuroticism and Openness among sexes where females scored higher on Neuroticism while males scored higher on Openness. Additionally, significant differences on Personality and Academic motivation among academic status (PL/DL) were also found. Significant relationship between the variables was also established. Moreover, Path analysis showed that Agreeableness has a direct effect on Extrinsic Motivation, and an indirect effect mediated by Avoidant coping strategy. While, Conscientiousness and Openness have a direct effect on Intrinsic Motivation, and an indirect effect mediated by Approach coping strategy. Finally, Amotivation was found to be predicted negatively by Agreeableness and Conscientiousness, where agreeableness and conscientiousness were indirectly mediated by Avoidant coping. These significant findings are vital in understanding the phenomena as well as for the development of post-pandemic programs in serving the affected sectors.

Keywords - academic motivation, coping, high-achieving, pandemic, personality

Introduction

In the beginning of 2020, a virus from China started to spread, which immediately became a global threat. The Novel Coronavirus (COVID-19) is an infectious disease that is transmitted through person to person contact or through passing of respiratory droplets by sneezing or coughing. On March 11, 2020, the World Health Organization (WHO) declared the novel coronavirus (COVID-19) outbreak as a global pandemic (Cucinotta & Vanelli, 2020). Almost every country in the world was forced to declare a community quarantine to contain and stop the spread of the virus, affecting many community sectors such as the economics, tourism, health and education.

In the Philippines, since the government declared enhanced community quarantines throughout the entire island of Luzon which subsequently followed the declaration of the nationwide state of calamity, the Department of Education issued guidelines prohibiting and suspending the final examination of the school year 2019-2020. Until now, the COVID-19 pandemic still affects the education system since academic institutions shifted from conventional learning methods to online lectures/classes as an alternative ways to resume education (Adnan and Anwar, 2020).

Preliminary findings reported that college students' increased anxiety during initial COVID-19 outbreaks were concerned not only about the infection but also about the economic and academic consequences of the pandemic on their futures (Cao et. al., 2020; Son et al., 2020), academic outcomes showed that the pandemic has led to a large number of students intending to change majors, withdraw from classes, and delay graduation (Aucejo et al., 2020). Meanwhile, the impact of COVID-19 pandemic on honor students' academic outcomes was consistently smaller than the impact on non-honors students (Aucejo et al., 2020). This opens the questions on what are their coping strategies and motivations to manage the academic problems carried by this pandemic.

With the shift to virtual learning as a result of the pandemic, coping allows the people to adjust to the new and stressful conditions and is essential for stabilization (Sheroun, 2020). Thus, in this time where learning has changed from face-to-face to computer-based approach, Coping Strategies are necessary to adjust.

In addition, Academic Motivation is an important factor on the learning behavior and achievement of the students (Vallerand et al., 1992), and several studies have shown that the primary determinant of academic success and achievement is academic motivation (Almaki, 2019). However, an important factor on how students are motivated to learn and achieve in their academics is their Personality traits (Komarraju & Karau, 2005; Hazrati-Viari et. al., 2012; Jensen, 2015).

Considering all of these factors, this study intended to see the impact of Personality Traits and Coping Strategies to the Academic Motivation of High-Achieving College students in the midst of the COVID-19 Pandemic, which, in our knowledge, is the only study that uses Filipino high achieving college students as representatives in documenting the personality traits, motivation, and coping strategies of the students during the COVID-19 pandemic.

This study adopted the definition of the five-factor model of personality developed by Robert McCrae and Paul Costa in 1980's, which divides an individual's personality into five traits: Openness or a need for variety, novelty and change; Conscientiousness that indicates achievement striving or a strong sense of purpose and high aspiration levels; Extraversion or gregariousness or a preference for companionship or social stimulation; Agreeableness is the willingness to defer to others during interpersonal conflict through forgiving attitudes and belief in cooperation; Neuroticism is characterized as low self-esteem, irrational perfectionistic beliefs, and pessimistic attitude. Coping strategies are often defined as efforts to avoid or minimize danger, harm and loss, or reduce the associated stress (Carver & Connor-Smith, 2010). In this study, the two strategies of coping from the brief-COPE (Carver 1997) were used. The Approach coping which is characterized by using active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support and the Avoidant coping which is characterized by denial, substance use, venting, behavioral disengagement, self-distraction and self-blame as a way to deal with stress. Further, Academic motivation can most simply be described as one of the effective factors on learners' achievement (Vallerand et al., 1992; Hazrati-Viari et al., 2012). There are three higher-order factors of academic motivation developed by Vallerand, et al. (1992): the Intrinsic Motivation is when students are willingly doing the activity and task for the pleasure and satisfaction derived from it and because of external rewards; the Extrinsic Motivation is experienced when an individual's action or approach to task is to gain external rewards; and the Amotivation which is simply as 'lack of motivation'. Additionally, the term high-achieving is used by researchers to refer to the student who stands out in terms of their academic abilities (Jeremy & Fisher, 2012) In this study, student who belongs in the Dean's listers (DL) and President's listers (PL) of the second semester of academic year 2019-2020 is referred to as high-achieving college students. And since the World Health Organization (WHO) defined coronavirus disease (COVID-19) as an infectious disease caused by a newly discovered severe acute respiratory syndrome coronavirus (SARS-CoV-2). In this study, COVID-19 Pandemic was linked to the overall stress experienced by the students during the spread of COVID-19.

Findings of this study will help the policymakers understand more the phenomenon and make the concerned sectors aware of the factors that makes high-achievers less impacted from the academic outcomes of the pandemic. Moreover, this research also aims to recommend an Honor Program/Society, a School Guidance Program in Don Honorio Ventura State University, Pampanga that will join all the high-achieving students in the university to promote academic motivation and positive coping strategy among students.

Limitations of the Study

To our knowledge, this is the only study that uses Filipino high-achieving college students as representative in documenting the personality traits, motivation, and coping strategies of the students during the COVID-19 pandemic, however, there are several limitations that should be noted. First, this study uses the pre-COVID-19 recorded grade of the respondents, or the 2019-2020 academic school year grades which was a combination of prior to and early start of the lockdown protocols of the government. These grades were used as a basis for the qualification of high-achievers which could change if COVID-19 did not happen. Second, this study also used self-report questionnaires in measuring the variables, where responses may be biased as respondents may be too embarrassed in answering the questionnaires. Third, the sample used only came from Don Honorio Ventura State University in Pampanga, Philippines and may not show a generalized result to all high-achieving college students. Fourth, the study only included students that belong to the rosters of President's and Dean's Listers with a minimum General Weighted Average (GWA) of 85 and a grade not lower than 85 per subject. This excludes other recognized high-achieving students such as the student athletes and student leaders. Fifth, this study did not measure other factors that can affect academic motivation during COVID-19 Pandemic, it only included personality traits and coping strategies.

Self-Determination Theory is one of the most commonly used empirically based psychological theories for interpreting factors that promote individual motivation (Hodge, 2017). Developed by Deci and Ryan (1985), Self-determination Theory was a macro-theory of human personality and motivation concerned with how the individual interacts and relies with the social world (Legault, 2017). SDT includes the concept of intrinsic and extrinsic motivation which according to Legault outlines how motivation influences situational responses in multiple domains of personality, social, and cognitive growth.
Deci and Ryan (1985) emphasized three needs of individuals to achieve psychological growth, the needs for autonomy, competence, and relatedness. Autonomy, as opposed to feeling controlled, pressured, or constrained, is the inherent need to experience self-direction and self-endorsement in action (Legault, 2017). According to Cherry (2019), Competence is the individuals' need to mastery of tasks and learn different skills, where in, when individuals believe they have the skills they need to excel, they are more likely to take steps to help them reach their goals. While the need for Relation or connection is the individuals' need to feel a sense of belonging and attachment to others. While this pandemic situation became a challenge to the students in achieving these needs, coping strategies and personality traits will be assumed to have an impact on students' motivation.

Literature Review

According to Hazrati-Viari et. al. (2012), one of the active factors in the achievement of learners is academic motivation, where learners ought to be interested in studying, or all of the educational system's attempts would fail. Further, the role of personality characteristics in explaining academic motivation and achievement is strongly supported with the emerging body of research that emphasizes individual differences in student behavior (Deci & Ryan, 1985; Raza & Sha, 2017; Komarraju et al., 2009).

While connection of stress, coping and academic achievement were studied by Gustems-Carnicer (2019), where they found that students who were less anxious and less active in cognitive avoidance and use problem-focused coping were also students who gained more academic achievement. In addition, Gustems-Carnicer also established that students under more stress performed poorly, but with age, stress decreases its effect on performance. Lazarus and Folkman (1984) referred to coping as the thoughts and behaviors that individuals have to meet the demands of stressful situations. Gurvich et al. (2020) emphasized that association of coping styles with better mental health were those classified as positive emotion focused coping styles and conversely, ineffective coping styles were associated with poorer mental health. On the context of education, several researchers concluded that approach coping strategies were related to good academic, physical, and psychological adjustment (Syed and Seiffge Krenke, 2015; Gustems-Carnicer et al., 2019), whereas evasive strategies usually mean maladaptive consequences for the students (Tavolacci et al., 2013; Deasy et al., 2014; Skinner et al., 2016; Tran and Lumley, 2019).

The COVID-19 pandemic has caused the biggest disturbance in education in history, having already had an almost universal effect on students and teachers worldwide, from pre-primary to secondary schools, institutions of Technical and Vocational Education and Training (TVET), colleges, adult learning, and facilities for the development of skills (United Nations, 2020). UN also stated that the pandemic had reportedly impacted 94 percent of students worldwide, representing 1.58 billion children and young adults, from pre-primary to higher education. Since these enlarged national school programs have faced the biggest challenge, COVID-19, most of their students, many governments have required institutions to stop face-to-face training, prompting them to turn to online teaching and virtual schooling almost instantly

(Daniel, 2020). And this abrupt change from traditional classrooms and face-to-face instruction to online learning has resulted in students getting a completely different educational experience (Adnan & Kainat, 2020). Where Adnan and Kainat reported that 67.5 percent of students indicated that online learning is way different from traditional learning, while 18.3 percent claim that online and conventional learning have little differentiation. Only 10.3% of students agree that online learning is more motivating than traditional learning, while most students (71.4%) reported contradiction that online learning is more motivating than conventional learning.

This transition to distance learning has also put a heavy strain on teachers, students and parents (Cachón-Zagalaz et al., 2020; Hiraoka and Tomoda, 2020; Daniel, 2020). This was supported in the study of Irawan et al. (2020), where findings indicate that (1) within the first two weeks of learning from home, students have begun to get frustrated with online learning, (2) major anxiety about research subjects whose parents have low incomes, because they have to reach quotas to engage in online learning, (3) mood or mood shifts occur due to too many assignments and are considered counterproductive by students.

As shown on Figure 1, circles represent the variables of the study and the rectangles represent the subtypes of the variables. It aims to show the Personality Traits as the independent variable (IV), the Academic Motivation as the dependent variable (DV), and Coping Strategies as the mediating variable (M). The arrow represents the possible effect of the IV and M to the DV, and the straight lines represent the connection between the subtypes and variables.

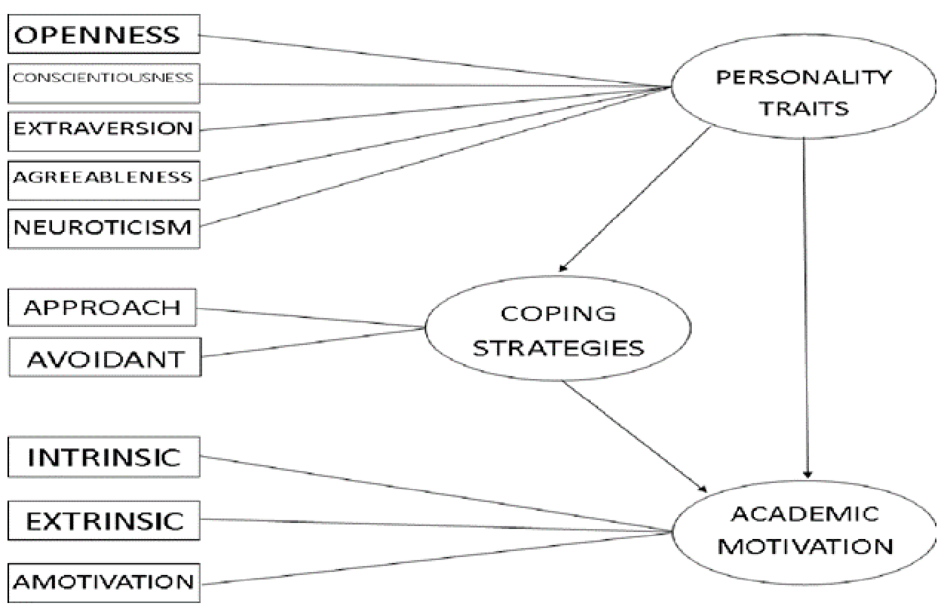


Figure 1. Representation of the Hypothetical Effect of Personality Traits to the Academic Motivation Mediated by Coping Strategies.

Research Hypotheses

1. There is no significant difference between the Personality Traits, Coping Strategies, and Academic Motivation of high-achieving college students in terms of age.

2. There is no significant difference between the Personality Traits, Coping Strategies, and Academic Motivation of high-achieving college students in terms of gender.

3. There is no significant difference between the Personality Traits, Coping Strategies, and Academic Motivation of high-achieving college students in terms of academic status.

4. There is no significant relationship between the subtypes of Personality Traits, Coping Strategies, and Academic Motivation of high-achieving college students.

5. Personality Traits have a direct effect on the academic motivation of High achiever college students during the COVID-19 pandemic.

6. Coping strategies mediate the effect of personality traits on academic motivation among high-achiever college students during the COVID-19 pandemic.

Methodology

Research Design

This study is non-experimental research that used a quantitative correlational research design in investigating the statistical relationship between the variables. This study specifically uses one-way ANOVA in finding the statistical differences of personality traits, coping strategies, and academic motivation in terms of age, gender, and academic status. Path analysis was used to find the pattern of effect of personality traits and coping strategies to the academic motivation of high achievers.

Population and Sampling

The total population of high-achieving college students of Don Honorio Ventura State University Main Campus is 895. Due to the situation of COVID-19 pandemic, a convenience sampling is used in gathering the number of respondents (N=281). High-achieving college students ages 18 to 30 that belong to the President's Lister (n1=71), and Dean's Lister's (n2=210) of the second semester of school year 2019-2020, are the participants of this study, where in, Males are 24.2% and Females are 75.8%.

The study only included students that belong to the rosters of President's and Dean's Listers with a minimum General Weighted Average (GWA) of 85 and a grade not lower than 85 per subject. This were the pre-COVID-19 recorded grade of the students or the 2019-2020 academic school year grades which was a combination of prior to and early start of the lockdown protocols as a basis for the qualification of high-achievers. And this excludes other recognized high-achieving students such as the student athletes and student leaders.

Instruments

Short Demographic Profile - A short demographic profile containing questions about the participant's Name (optional), Age, Gender (Male or Female), Course, Year and Section, and Academic Status (President's Lister or Dean's Lister) was given.

Big Five Personality Inventory-44 - The Personality Traits was measured using the Big Five Personality Inventory-44 (BFI-44) developed by Oliver John and Sanjay Srivastava in 1999. It is a self-report inventory that is designed to measure the Big Five dimensions of Personality based on the Five Factor Model. It is a 44-item with a 5-point Likert Scale that ranges from (1) Disagree Strongly to (5) Agree Strongly. The internal consistency measured by the Cronbach Alpha ranges from .75 to .80 for the subscales, and 3-month test-retest reliabilities from .80 to .90. The BFI-44 consists of five personality dimensions; Openness to Experience (10 items), Conscientiousness (9 items), Extraversion (8 items), Agreeableness (9 items), and Neuroticism (8 items). All items consist of short phrases, e.g. "tends to be quite", "is full of energy" (John, O.P., & Srivastava, S., 1999). Subscale scores are created by reverse scoring specified items, and summing the ratings for the items on each subscale.

Brief-COPE - The Coping Strategies was measured using the Brief-COPE Inventory developed by Charles Carver in 1997. It is the abbreviated version of the COPE which is designed to measure a broad range of coping responses. It is a self-report measure with a 28-item 4 point-Likert scale ranging from "I haven't been doing this at all" (score 1) to "I have been doing this a lot" (score 4). The higher score of the subscale demonstrates more likely the coping strategies were used by the participants.

The internal consistency measured by Cronbach Alpha for the overall Brief COPE was 0.70 which indicates a good consistency. And the Cronbach alpha for the subscales ranged from 0.44 to 0.89, with the lowest alpha for the behavioral disengagement subscale and the highest for the substance use subscale.

The Brief-COPE is composed of two overarching coping styles The Approach Coping that consists of 6-subscales; Active Coping, Positive Reframing, Planning, Acceptance, Seeking Emotional Support, Seeking Informational Support. The Avoidant Coping which includes 6-subscales; Denial, Substance Use, Venting, Behavioral Disengagement, Self-Distraction, Self-Blame. The subscales “humor” and “religion” are neither Approach Coping nor Avoidant Coping (Carver, 1997).

Academic Motivation Scale (AMS-C 28) - The Academic Motivation Scale (AMS-C 28) developed by Vallerand, et al. in 1992, will be used to examine why students go to college. It is a 28-item scale scored on a 7-Likert scale ranging from (1) Does not correspond at all to (7) Corresponds exactly. An average of the total scores on each subscale is taken as the score. The internal consistency measured by Cronbach alpha is .809. It is composed of seven subscales of 4-items assessing three types of Intrinsic Motivation (IM), three types of Extrinsic Motivation (EM), and Amotivation (AM) (Arvidsson et al., 2013). The three types of IM are the intrinsic to know (to do something for the pleasure and satisfaction experienced while learning); to accomplish things (to do something for the pleasure and satisfaction experienced while trying to accomplish things); and to experience stimulation (to do something in order to experience stimulation sensations). The three types of EM are external regulation (e.g., to do something because one is pressured by someone to do it); introjected regulation (e.g., to do something because one pressured themselves to do it) and identified regulation (to do something because one has decided to do it although it is not fun). Finally, amotivation refers to the absence of intrinsic and extrinsic motivation (Vallerand et al., 1993) or the behaviors that lack purpose (Arvidsson et al., 2013).

Data Collection and Data Analysis

The data collected were gathered through online platforms where Google-Form link of the Informed Consent together with the series of standardized tests (big five personality inventory-44, brief- COPE, and academic motivation inventory) and a short demographic profiling were sent. The data collected from the Google-Forms were inputted in the Microsoft Office Excel for data organization
The data were transferred to the Statistical Package for Social Sciences (SPSS) software for statistical analysis. The differences in the Personality Traits, Coping Strategies and Academic motivation of the respondents in terms of age, gender and academic status were analyzed using one-way ANOVA (Analysis of Variance). The one-way Analysis of Variance is a method used to analyze whether there are any statistically significant differences between three or more independent variables. Additionally, Path Analysis is used to analyze the effect of Personality traits to the Academic motivation of high-achieving students during COVID-19 pandemic, with Coping Strategies as mediator. Path Analysis is a statistical technique to investigate patterns of effect within variables.

Results and Discussions

Demographic Data

The samples in this study were generally females (75.8%), ages 18-30. And majority of them belong to the Dean’s List (74.7%) and the College of Social Sciences and Philosophy (CSSP-50.5%) of Don Honorio Ventura State University. The data are shown in Table 1.

Table 1. Frequency and Percentage of the Demographic Variables of the High Achieving College Students

Demographic Variables	n	%
Gender		
Male	68	24.2
Female	213	75.8
Age		
18 - 21	251	89.3
22 – 25	27	9.6
26 - 30	3	1.1
Colleges		
CSSP	142	50.5
CAS	32	11.4
CBS	15	5.3
CHTM	11	3.9
CIT	10	3.6
CEA	19	6.8
CCS	2	0.7
COE	50	17.8
Academic Status		
President's Lister (PL)	71	25.3
Dean's Lister (DL)	210	74.7

Levels of personality traits, coping strategies, and academic motivation.

As presented in Table 2, results of this study showed high-achieving students' high scores on Openness indicates that high-achievers are curious, imaginative, and excitable, which is similar to the suggestion that students who scored high on Openness to experience will be more successful in their university (Komarraju & Karau, 2005). This also indicates that Openness to experience can predict academic achievement and performance (Hazrati-Viari et. Al., 2012). On the other hand, participants' low scores on Extraversion resemble the findings of Soraya Hakimi et. al. (2011) where extraversion has a negative relationship with academic achievement since extraverted individuals are more likely to be impatient, impulsive in problem-solving, and distracted, as a result, they have lower academic achievement. This was supported by the studies of Blau et al., (2017) wherein they explained that extroverted students remained focused and had higher achievements in face-to-face learning, which was contrary to the current situation of pandemic. Coping Strategy's scores of the participants presented a similar results with the qualitative study of Shaunessy and Suldo (2010) that states gifted students and high-achieving students frequently respond to stress through positive reframing, task management and seeking social support, which are part of the Approach Coping strategy. And the participants' high scores on Extrinsic Motivation can be a result of their conception of education wherein they may perceive that going to school is a means of pleasing parents and avoiding unfavorable community repercussions (Gbollie & Keamu, 2017).

Table 2. High Achieving students' Levels of Personality traits, Coping Strategies and Academic Motivation

Variables	M	SD
Personality traits		
Extraversion	24.23	4.46
Agreeableness	35.26	5.076
Conscientiousness	31.95	5.08
Neuroticism	24.52	5.56
Openness	36.98	4.77
Coping Strategy		
Approach	49.13	7.36
Avoidant	33.90	6.28
Academic Motivation		
Extrinsic	69.25	9.47
Intrinsic	67.56	11.13
Motivation	8.29	4.82

Differences in terms of Age.

In Table 3, results in the differences between Personality traits of high-achieving college students in terms of age showed no significant differences, thus, accepting the null hypothesis. But outcomes indicate that high-achieving college students ages 26-30 are more likely to exhibit gregariousness, assertiveness, excitement-seeking or adventurous behaviors, positive emotions, warmth, and enthusiasm than the students ages 18-25.

Coping strategies of high-achieving college students also had no significant differences when it comes to age, this finding contradicts the study of Richaud and Sacchi (2005), where they stated that coping strategies vary with age as evasion and escapism declines with age. In their study, they stated the coping method used by the middle-aged group differs from the coping methods of young adulthood, where in the middle-aged group uses logical thinking and direct action in facing stressors, meanwhile, young adults tend to escape problems through magical thinking or the expectation that things will fall into place by themselves. Additionally, differences on academic motivation of the participants in terms of age showed no significant results in contrast to the findings of Kusurkar et al. (2010) that stated motivation strengthens between the age of 18 to 24. They further explained that strength of motivation is not static, it tends to be a complex entity because it changes with age and maturity. Pandemic situation can be a factor in the contradicting results. Factors such as close age grouping and the pandemic situation may affect the absence of significant results.

Table 3. Analysis of Variance in Terms of Age

Measures	Age	M	SD	F	Sig.	Interpretation
Personality traits						
Extraversion	18 - 21	24.33	4.449	1.84	.165	
	22 - 25	22.93	4.471			Not Significant
	26 - 30	27.00	3.606			
Agreeableness	18 - 21	35.29	4.915	.302	.739	
	22 - 25	35.22	6.600			Not Significant
	26 - 30	33.00	3.606			
Conscientiousness	18 - 21	32.02	5.034	1.272	.282	
	22 - 25	31.85	5.517			Not Significant
	26 - 30	27.33	4.163			
Neuroticism	18 - 21	24.56	5.598	.069	.934	
	22 - 25	24.15	5.503			Not Significant
	26 - 30	24.33	4.619			
Openness	18 - 21	37.02	4.737	1.054	.350	
	22 - 25	36.96	5.133			Not Significant
	26 - 30	33.00	4.359			
Coping Strategy						
Avoidant	18 - 21	33.83	6.412	.675	.510	
	22 - 25	34.15	5.209			Not Significant
	26 - 30	38.00	1.000			
Approach	18 - 21	48.99	7.546	.474	.623	
	22 - 25	50.44	5.388			Not Significant
	26 - 30	49.00	7.211			
Academic Motivation						
Extrinsic	18 - 21	69.36	9.417	.157	.854	
	22 - 25	68.33	10.269			Not Significant
	26 - 30	68.33	8.622			
Intrinsic	18 - 21	67.82	10.746	.740	.478	
	22 - 25	65.52	14.690			Not Significant
	26 - 30	63.33	3.215			
Motivation	18 - 21	8.28	4.774	.033	.967	
	22 - 25	8.30	5.173			Not Significant
	26 - 30	9.00	6.928			

Differences in terms of Gender.

Table 4, showed the Analysis of Variance of high-achieving college students' significant differences on Personality Traits (Neuroticism and Openness) in terms of gender. Wherein females scored higher on Neuroticism, which suggests that they are often anxious, insecure and self-pitying. They are viewed as moody, irritable and are vulnerable to extreme sadness and low self-esteem (John and Srivastava, 1999). Biological factors such as hormonal changes from monthly period, pregnancy, breast-feeding, and menopausal changes may affect the result (Djudiyah et.al, 2016). Meanwhile, males scored higher on Openness which suggests that male high achievers are more curious, imaginative, artistic and excitable compared with female high achievers. Djudiyah et.al reached similar results and contradicts the study of Vecchione et al. (2012) and Rahmani & Lavasani (2012) where they stated that females significantly scored higher on Openness compared to males. Differences found in terms of gender are not similar to the conclusions of Soraya Hakimi et al., (2011), wherein they stated that Personality Traits have no significant differences between male and female. Differences in cultural values, participants being evaluated, gender roles in each culture, and stereotypes within a society might result in these contradictory findings.

Meanwhile, investigation on the coping strategies of high-achieving college students showed no significant differences between male and female, thus, accepting the null hypothesis. These results oppose findings from the studies that have shown women to prefer the use of emotion-focused coping styles as a response to an anxiety provoking situation (Kelly et. al., 2008) and where males use more problem-focused or instrumental approaches to cope with stressful experiences, which is a part of the Approach Coping Strategy (Matud, 2004).

Table 4. Analysis Of Variance In Terms Of Gender

Measures	Gender	M	SD	F	Sig.	Interpretation
Personality traits						
Extraversion	Male Female	24.50 24.14	4.765 4.364	.334	.564	Not Significant
Agreeableness	Male Female	35.25 35.27	5.959 4.776	.001	.980	Not Significant
Conscientiousness	Male Female	31.85 31.99	5.575 4.926	.038	.864	Not Significant
Neuroticism	Male Female	22.96 25.02	5.896 5.374	7.242	.008	Significant
Openness	Male Female	38.10 36.62	4.990 4.657	5.080	.025	Significant
Coping Strategy						
Avoidant	Male Female	33.47 34.04	6.779 6.122	.426		Not Significant
Approach	Male Female	48.68 49.28	7.235 7.404	.343		Not Significant
Academic Motivation						
Extrinsic	Male Female	67.93 69.68	10.260 9.184	1.766	.185	Not Significant
Intrinsic	Male Female	65.44 68.23	12.118 10.738	3.262	.072	Not Significant
Amotivation	Male Female	7.99 8.38	5.267 4.670	.354	.522	Not Significant

Differences in terms of Academic Status.

Table 5 shows the differences of Personality in terms of Academic Status (President's lister and dean's lister), significant results on Conscientiousness and Openness were found, wherein President's listers (PL) scored higher on Conscientiousness and Openness. This shows that PLs are more efficient, organized, thorough, imaginative, curious, artistic, not lazy, not impulsive, and not careless compared to students on the Dean's list. However, no significant differences on coping strategies in terms of academic status were found which implies that coping strategies of both PL and DL during COVID-19 were almost similar. On the academic motivation, significant differences in Intrinsic and Amotivation were found. PL scored higher on Intrinsic Motivation which suggests that they were more motivated to study because of their intrinsic motivation to know and to accomplish things compared with DLs. On the other hand, DLs scored higher on Amotivation suggesting that they were more prone to lack academic motivation compared to PLs.

Table 5. Analysis of Variance in terms of Academic Status

Measure	Academic Status	M	SD	F	Sig.	Interpretation
Personality						
Extraversion	PL DL	23.92 24.33	4.471 4.460	.456	.496	Not Significant
Agreeableness	PL DL	35.68 35.12	4.919 5.132	.627	.429	Not Significant
Conscientiousness	PL DL	33.27 31.51	4.219 5.276	6.442	.012	Significant
Neuroticism	PL DL	24.75 24.44	6.084 5.391	.157	.692	Not Significant
Openness	PL DL	38.42 36.49	3.974 4.928	8.983	.003	Significant
Coping Strategy						
Avoidant	PL DL	32.79 34.28	5.104 6.598	3.018	.083	Not Significant
Approach	PL DL	48.14 49.47	7.909 7.147	1.729	.190	Not Significant
Academic Motivation						
Extrinsic	PL DL	68.00 69.68	8.728 9.686	1.668	.198	Not Significant
Intrinsic	PL DL	70.61 66.52	9.466 9.245	7.297	.007	Significant
Amotivation	PL DL	7.23 8.65	4.151 4.977	4.691	.031	Significant

Relationship between the Subtypes of Personality traits, Coping strategy, and Academic Motivation.

On Table 6, Analysis of the results shows a significant relationship between facets of Personality Traits, Coping Strategies, and Academic Motivation, therefore, rejecting the null hypothesis.

Personality Traits and Coping Strategy Subtypes - Results of this study showed that Personality trait was significantly correlated with Coping Strategies.

Extraversion was correlated with Approach coping. This supports the findings of Afshar et al., (2015) stating that adaptive personality traits such as extraversion was positively correlated with problem engagement, positive reframing, planning, acceptance, and seeking social support, these coping strategies are subtypes of approach coping similar to this study. Aside from extraversion, Afshar et al. included facets like openness, agreeableness and conscientiousness of personality traits as also correlated with approach coping strategies.

Further, Agreeableness was found to be significantly correlated with Approach coping similar to the study of Karimzade and Besharat (2011) where agreeableness was associated positively with problem-focused and positive emotional-focused coping styles and negatively correlated with negative male emotional-focused coping styles, while in female students it was positively correlated with problem-focused coping styles and negatively correlated with negative emotional-focused coping styles. This suggests that since agreeable students tend to be more friendly and cooperative, they tend to avoid conflicts and arguments and they cope better with stressful events and situations through the support of others. This is beneficial since students with high agreeableness are found to be less likely subjected to bullying at school (Jensen-Campbell et al, 2002).

Conscientiousness was found to have a significant positive relationship with approach coping and significant negative relationship with avoidant coping strategies. This was first studied by past research that associates conscientiousness to health-related behaviors and coping strategies (Connor- Smith and Flachsbart, 2007; Saklofske et al., 2007). As an increase in stress management, stress tolerance and the capacity to avoid stress was thought to be linked to conscientiousness (Besser and Shackelford, 2007).

High levels of conscientiousness understand the uncertainty and stress involved with this pandemic, as well as the mandatory preventive actions. Rather than reacting passively or binge drinking, they stay active and engaged in learning and growth during the lockdown, and usually seek support from family and relatives (Prentice et. al., 2020). Meanwhile, Neuroticism had a significant positive correlation on Avoidant and negative correlation to Approach coping.

Meanwhile, Neuroticism had a significant correlation on Avoidant and negative correlation to Approach coping. Neuroticism is characterized by anxiety (tense), angry hostility (irritable), depression (not contented), self-consciousness (shy), impulsiveness (moody), and vulnerability (not self-confident) (John & Srivastava, 1999). Making the high-achievers with high neuroticism persistent worriers, fearful, not only on health related issues, but also on the academic impact of the COVID-19 pandemic (Cao et. al., 2020; Son et. al., 2020). Because of this, they cope with stressful events through denial, venting, self-distraction and self-blame (McCrae, 2002; Afshar et al., 2015) like online media platforms such as Facebook and Tiktok. Studies addressed media as a form of escapism (Halfmann & Reinecke, 2021) and is frequently referred to as a dysfunctional coping strategy (Meier et al., 2018).

Additionally, Openness is significantly correlated to Approach coping. The personality trait Openness to Experience is characterized by curiosity, imagination, artistic, and excitement. Their high-achieving students desire to pursue new things (McCrae and Costa, 1999) help them to cope with stressful and problematic situations like COVID-19 pandemic through active coping, like meditation and breathing exercises, positive reframing, listening to music, reading, drawing, and communicating with their families and friends as reported by Son et. al., (2020). This supports the studies that high scores on openness to experience have shown a correlation with positive reappraisal, information seeking, and problem solving, but a poor association with avoidance coping (Carver and Connor-Smith, 2010).

Personality Traits and Academic Motivation Subtypes - Analysis of the data shows that Extraversion was correlated with Intrinsic Motivation. Since Extroverted students thrive in social situations and gain their energy from being around others, they struggle in the world of social distancing (Théo Pavlich, 2020; Jill Suttie, 2021). This increases their instinctive drive to study and accomplish things which supports the findings of Clark and Schroth (2010) wherein extraversion is related with intrinsic motivation in terms of learning and achieving goals.

Moreover, Agreeableness is found to also have a significant relationship with all of Academic motivation's subtypes (Intrinsic Motivation, Extrinsic Motivation and Amotivation). Similarly, significant correlation between agreeableness and subtypes of academic motivation was found by several researchers (Ariani, 2013; Bozanoğlu & Sapanc, 2015; de Caso Fuertes et al., 2020), in contrast to the studies of Komarraju et al., (2009) and Raza and Nida, (2017). The presence of the current pandemic may affect the contrasting result.

Correspondingly, analysis of the results also showed significant positive relationship between conscientiousness and the academic motivation subtypes: intrinsic motivation, extrinsic motivation, and a significant negative correlation to amotivation. Students with a high level of conscientiousness always stay firm in their own opinions and decisions (Vanarasama et. al., 2018), have self-discipline (John & Srivastava, 1999) and they always strive for achievement (McCrae and John, 1992). This characteristic helps the high-achievers to stay focused and motivated in the midst of pandemic. Likewise, researchers found the same link between conscientiousness and academic motivation (Clark and Schroth, 2010; McAbee and Oswald, 2013; Raza and Nida, 2017; Hazrati-Viari et al., 2012).

Moreover, Neuroticism was found to have a significant positive relationship with Amotivation. . Individuals that are amotivated are neither intrinsically nor extrinsically motivated. They just assume that their behavior is the product of something that is beyond their control (Vallerand et al., 1992). As neuroticism is strongly linked to the tendency for negative mood states (McCrae & Costa, 1985), fear of COVID-19, and boredom (Caci et. al., 2020), high-achievers' amotivation might be triggered due to their neurotic tendencies and need for perfection (Horney, 1945) resulting in a positive significance of neuroticism and lack of motivation during the pandemic.

Openness has also a significant relationship with Academic motivation' subtypes, (intrinsic motivation, extrinsic motivation and amotivation) upon analysis of the data. Since students with high openness tend to step outside of their comfort zones and acquire a diverse set of interests in order to get new experiences (Vanarasama et. al., 2018), they are likely to be self-motivated and determined to achieve their own goals (Rahiem, 2020), even during the course of pandemic. Similar results were found by previous researchers (Raza and Nida, 2017; de Caso Fuertes et al., 2020).

Coping Strategy and Academic Motivation Subtypes - Avoidant coping strategy is significantly correlated with the three main academic motivation's subtypes (intrinsic motivation, extrinsic motivation and amotivation). This describes the possibility that the way students cope through distraction (sleeping longer) and substance use (smoking and alcohol) (Son et. al., 2020) during the learning difficulties experienced in the time of pandemic was because they either have an intrinsic motivation to learn for the pleasure derived from learning or they want to learn because they were extrinsically motivated and were expecting a reward or punishment (Gustiani, 2020). There's also a possibility that their behavioral disengagement is due to their lack of motivation to learn while being on an unconventional learning method such as online class (Mese & Sevilen, 2021).

Finally, Approach coping strategy was found to have a significant relationship with Intrinsic and Extrinsic motivations. For instance, high-achieving students who tend to accept the changes done by the pandemic in their school activities were because they want to improve their capabilities and accomplish studies with personal enjoyment (Rahiem, 2020) or they were regulated by rewards such as praise from the family because they were part of the President's and Dean's list, or pressure from the expectation that they will be again part of the list at the end of the semester (extrinsically motivated). They often have plans on what they need to do, and often seek social support to cope with stressful situations (Carver, 1997) such as pandemic. Accordingly, Carver also linked Approach coping with more helpful responses to hardships, including adaptive practical adjustment, better physiological health outcomes and more stable emotional responding. Meanwhile, no significant relationship between approach coping and amotivation was found.

This further explains the characteristic of high achievers to use both internal and external factors to fuel their academic motivation (Griffin, 2006).

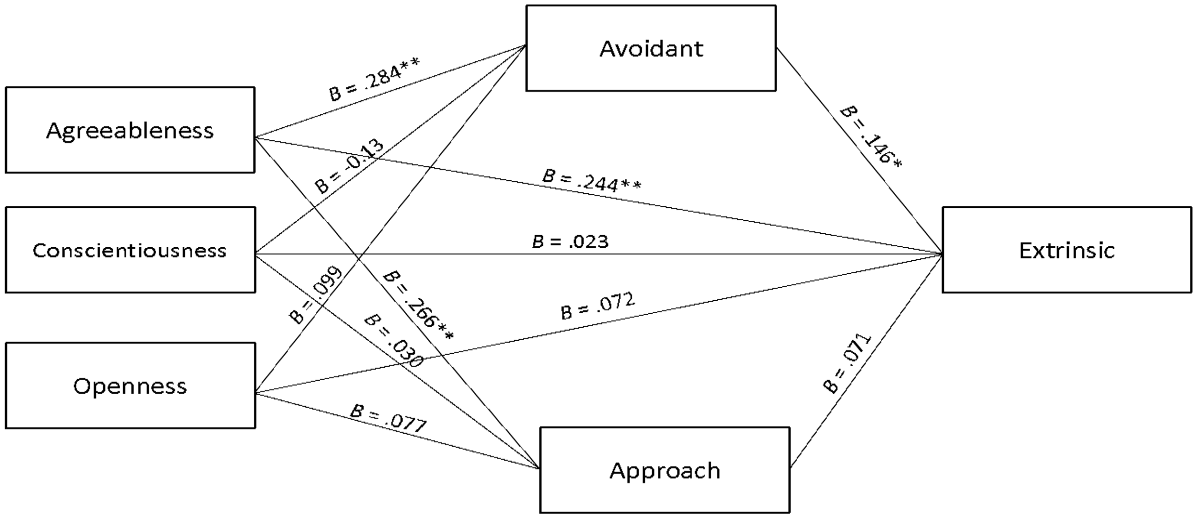
Table 6. Correlation of the Variables

Variables	M (SD)	2	3	4	5	6	7	8	9	10
1. Extraversion	24.23 (4.46)	.136*	.045	-.126*	.258**	.037	.127*	.052	.128*	-.073
2. Agreeableness	35.26 (5.076)		.362**	-.337**	.231**	.042	.388**	.302**	.267**	-.236**
3. Conscientiousness	31.96 (5.08)			-.376**	.393**	-.151*	.159**	.129*	.316**	-.285**
4. Neuroticism	24.52 (5.56)				-.128*	.236**	-.179**	-.001	-.042	.202**
5. Openness	36.98 (4.77					.051	.208**	.160**	.468**	-.133*
6. Avoidant	33.90 (6.28)						.537**	.195**	.157**	.342**
7. Approach	49.13 (7.36)							.263**	.362**	-.032
8. Extrinsic	69.25 (9.47)								.505**	-.197**
9. Intrinsic	67.56 (11.13)									-.233**
10. Amotivation	8.29 (4.82)									

Following the analysis of the results in figure 2, only Agreeableness was found to have a direct effect on Extrinsic Motivation. Individuals who are high on Agreeableness are described as not demanding, sympathetic, and forgiving (McCrae & Costa, 1999; John & Srivastava, 1999), while individuals who have high scores on Extrinsic Motivation are often described from the way they act or approach task because of an external factors (Vallerand et al., 1992). Since Agreeableness is a personality trait that is suited to situations that needs teamwork, collaboration, and cooperation (Rivers, 2021), high-achievers' tendency to become cooperative, compliant, and not demanding during this pandemic directly affects their motive to learn. Students frequently found motivation to learn in their social relations (Rahiem, 2020) such as encounters within the classroom and school (Rowell & Hong, 2013), and these social relations were restricted because of the efforts to contain the spread of the virus. On the contrary, Raza, and Shah (2017) found that among the big five factors, only Agreeableness has no significant effect on the academic motivation of higher education students.

Meanwhile, path analysis (figure 2) also showed that Avoidant coping mediates the effect of Agreeableness to the Extrinsic Motivation of high achievers. Since, quarantine and social isolation have been shown to increase stress and anxiety of the students (Brooks et. al., 2020; Pfefferbaum & North, 2020; Son etal, 2020; Cao et. al, 2020), their avoidant coping reported by Son et. al., such as, ignoring the news about COVID-19, sleeping longer, distracting themselves by doing other tasks, and drinking or smoking intercedes the effect of the agreeableness to their extrinsic motivation. Some students might view college as instrumental in achieving their goal (Deci et al., 1991).

Figure 2. Path Model of the possible effect of Personality traits to the Extrinsic Motivation of High Achieving college students



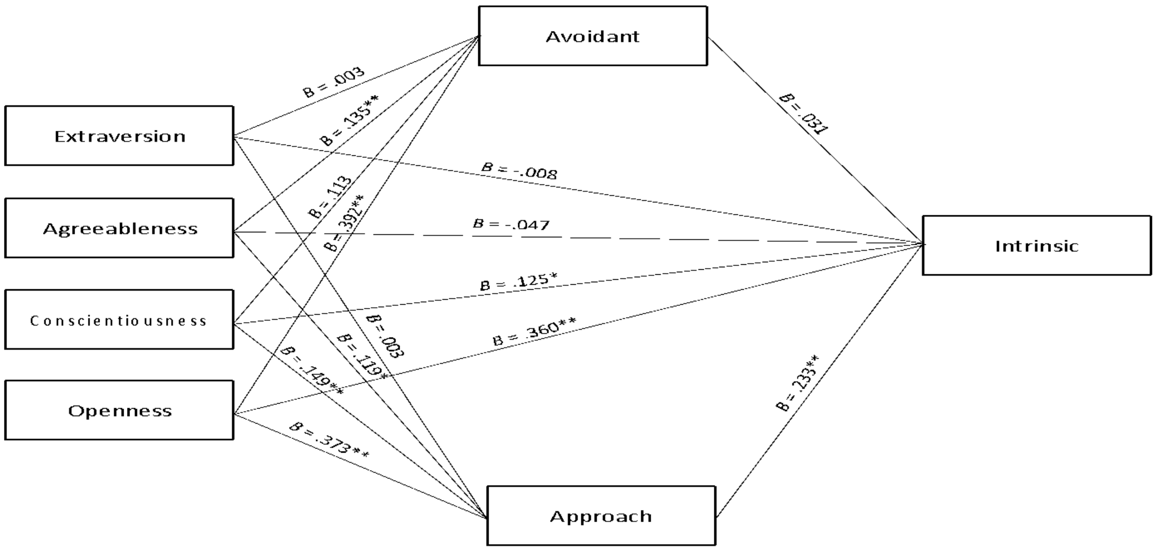
As shown on figure 3, conscientiousness has a positive direct effect on the Intrinsic Motivation of high achievers during pandemic. Students with higher levels of conscientiousness have a strong desire to accomplish and are more likely to attain higher academic success (Tomsik, 2020). In the same way, Conscientiousness is the personality trait that tells how focused, careful and disciplined the individual is on achievement (Raza and Shah, 2017; Kappe & Flier, 2012). This was supported by the positive connection between Intrinsic Motivation and Conscientiousness (Phillips et al., 2013), where conscientiousness can be considered as the strongest predictor of the personality of learners even during the course of the pandemic (Yu, 2021).

In addition, Openness also directly affects intrinsic motivation. This implies that high achievers are participating in virtual school activities because they were open-minded, curious, and imaginative. Being interested and curious, their desire to gain deep understanding of many things can lead to new learning methodologies, such as online classes, resulting in their academic success (Hazrati-Viari et. al., 2012).

This was supported by the studies that relate conscientiousness and openness to intrinsic motivation (Watanabe & Kanazawa, 2009). Meanwhile, in the findings of Colquitt et al., (2000), he stated that conscientiousness was the only factor that affects the individual motivation to learn. The presence of COVID-19 pandemic may affect the contrasting results of the studies.

However, Path analysis also revealed the indirect mediation of Approach coping in the effect of conscientiousness and openness to the intrinsic motivation of the respondents. This indicates that high achievers' active coping during pandemic, such as planning their schedules (Son et. al., 2020) to balance school activities and house chores, finding something to be grateful about amidst academic challenges brought by the pandemic, and seeking informational support to be knowledgeable about the new normal situation thru media (Eden et. al., 2020) mediates the positive effect of conscientiousness and openness to the intrinsically motivated behaviors of the respondents towards continuing virtual learning in pandemic.

Figure 3. Path Model of the possible effect of Personality traits to the Intrinsic Motivation of High Achieving college students

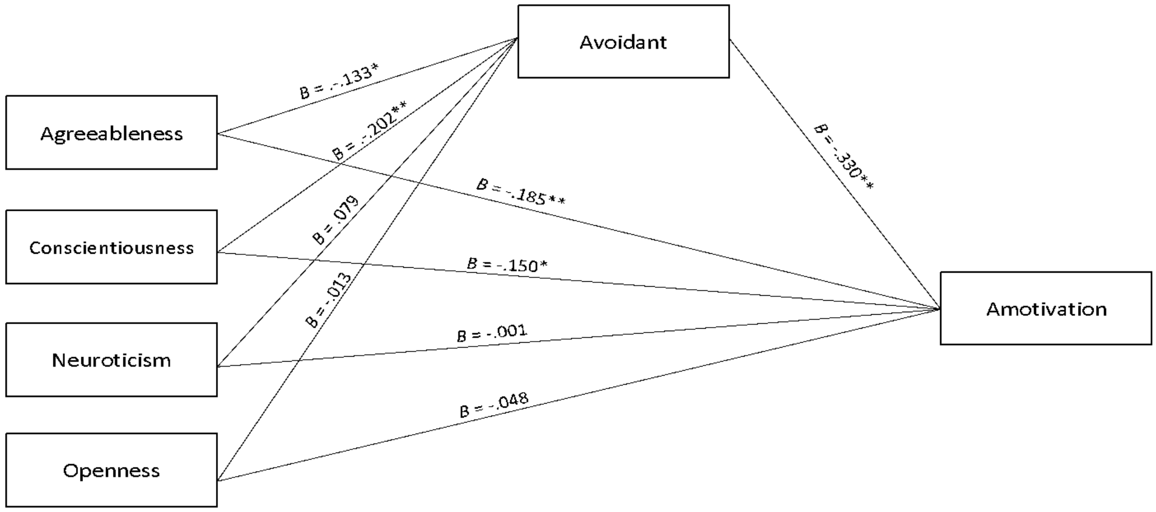


On the last measured subtype of academic motivation as shown in figure 4, Amotivation or the factor that affects lack of motivation (Deci & Ryan, 1985), Agreeableness and Conscientiousness were found to be predictors, negatively. This means that the lower the score of high-achievers in Agreeableness and Conscientiousness, the higher their tendency to lose motivation to learn during the COVID-19 pandemic. Since conscientiousness is the strongest positive contributor of academic motivation (De Feyter et. al., 2012), they are still likely to positively evaluate online learning (Bhagat et. el., 2019) making them less likely to experience amotivation. Considering that individuals with high agreeableness were described as caring, compassionate and tends to get along with others (Brinkman, 2013), changes brought by the pandemic like the new normal set-up of education (synchronous and asynchronous type of schooling) required more intrinsic and extrinsic motivation to learn (Aucejo et al., 2020) making the high-achievers agreeable traits to be negative predictors of amotivation.

On the other hand, Agreeableness and Amotivation were negatively mediated by the avoidant coping strategies. While high achievers with high agreeableness display compliance and altruism towards others, their denial, behavior disengagement, and self-distraction as ways to cope throughout pandemic (Son et. al., 2020) affects their academic motivation. Since they felt great sympathy for others (Asselmann et. al., 2020), the way they saw the negative impact of COVID-19 to the community can result in their decrease in learning motivation.

Likewise, Conscientiousness and Amotivation were also negatively mediated by avoidant coping. High-achievers who are organized, efficient and dutiful (John & Srivastava, 1999) were found to have low amotivation, however, when mediated by avoidant coping, participants' amotivation is predicted to change. This suggests that high achievers who cope by self-distraction through substance use (e.g. Smoking, alcohol intake), and self-blame during pandemic (Son et. al., 2020) are expected to have a lack of motivation towards schooling. This was supported by the studies that state, the use of avoidance coping strategies increase as several students experienced stress (Gustems-Carnicer et al., 2019) like the current pandemic.

Figure 4. Path Model of the possible effect of Personality traits to the Amotivation of High Achieving College students



Conclusion and Recommendations

Understanding the academic difficulties faced by the students during the pandemic were discussed, as well as the coping strategies that can be beneficial not only for the high-achieving students but also for the regular students affected by the pandemic. This study aims to see the relationship of personality traits, coping strategies and their possible effects on the academic motivation of high achievers during COVID-19 pandemic.

The following conclusions were derived from the present study

1. There is no significant difference in personality traits, coping strategies, and academic motivation among ages.
2. There is a significant difference in personality traits (levels of neuroticism and openness) among genders.
3. There is no significant difference on the coping strategy and among academic motivation genders.
4. There is a significant difference in personality traits and academic motivation in terms of academic status.
5. There is no significant difference in coping strategies in terms of academic status.
6. There is a significant relationship between personality traits and Coping strategies.
7. There is a significant relationship between personality traits and academic motivation.
8. There is a significant relationship between coping strategies and academic motivation.
9. The Personality traits affect academic motivation.
10. Coping strategies mediate the effect of personality traits to academic motivation.

Recommendations

Results showed the significant effect of positive personality traits such as conscientiousness and openness in developing the academic motivation of high achievers, as well as the impact of adaptive coping to the increase of intrinsic and extrinsic motivation needed by high achievers in this new normal set up of the universities. However, since the study only uses one University to gather the samples, the future researchers are recommended to extend the scope of the sample size which can possibly yield a much generalized results as well as to use an equal ratio of the females and males, PLs and DLs, and an equal respondents of the respective colleges. Researchers are also recommended to take other variables such as socio-economic status, teaching methods, family environment, and internet connectivity of the high achievers during COVID-19 pandemic. To see a broader perspective on the high-achievers' capabilities, it is also recommended to make a comparison on their personality, coping, and academic motivation, Post-

COVID-19 pandemic. Additionally, inclusion of other recognized high achievers such as student athletes and student leaders should also be considered. And to establish more specific results, it is suggested to analyze the data using a sequential equation model that can include the subtypes of the measured variables, as well as to compare the variables of low achievers with high achievers to garner more complex results. It is recommended to use the students GWA during the entire course of the pandemic as a basis for a high-achieving student. Since the current study used a GWA from the face to face classes to the transition of online class. Finally, to the students experiencing academic difficulties as an outcome of the pandemic, it is recommended to practice approach coping strategies (active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support). Based on the results of this study, approach coping strategies could help improve an individual's way of striving for success in academic achievements. Also, approach coping strategies are generally healthier ways of coping to stress and dealing with the problem compared to avoidant coping strategies.

Acknowledgement

First and foremost, praises and thanks to the God Almighty, for His showers of blessings throughout our research work to complete the research successfully.

Immeasurable appreciation and deepest gratitude for the help and support are extended to the following persons who in one way or another have contributed in making this study possible.

Ma'am Quincy Tanhueco, thesis adviser, for her support, advice, guidance, patience, and for sharing her time in the completion and success of this study.

Sir Antonio Morales, Chairman of the Psychology Department and research professor. For his continuous support, words of encouragement, enthusiasm, and for his guidance in the step-by-step process of completing this study.

Ma'am Sherna Bangalan, statistician and consultant, for her help in the analysis of data and its statistical computation, insightful comments, suggestions, and sharing her immense knowledge for the success of this study.

University Registrar, Data Protection Office, College Deans and their Secretaries, and College Governors, for their trust and help in the data gathering process.

Respondents, for their cooperation and time in terms of providing us the information needed in this study.

Members, for their stimulating discussions, sleepless nights and teamwork in meeting deadlines. The families' endless support, for letting us work in their homes and for hosting sleepovers. We are very grateful to have you.

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"Kawatas-watasan ning Kayanakan": Lived Experiences of Kapampangan Spoken Word Poetry Winners

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Abstract - This study explored the lived experiences of nine (9) Kapampangan informants who have won in multiple Kapampangan Spoken Word Poetry competitions. Anchored on qualitative phenomenology, the data were gathered through semi-structured interviews that were conducted online. The results showed that the informants view Kapampangan Spoken Word Poetry contests as platforms to develop their talents and as programs to promote the "Amanung Sisuan." They characterize these competitions as gateways to widen their linguistic knowledge and literary understanding, develop their confidence and skills, be granted the opportunity to be mentored by Kapampangan experts, and be recognized in the field. They have also identified these competitions as opportunities to help rescue the original Kapampangan language from extinction, ignite the awareness and interest of the youth in Kapampangan Language and Literature, and encourage public participation and awareness through social media platforms. Moreover, the informants have also encountered various challenges in this pursuit. Some of their predicaments are: difficulty in poem construction, discouragement, social media popularity criteria, and lack of resources. To address these dilemmas, the informants have sought the guidance of Kapampangan poets and advocates while at the same time relying on their personal dedication and persistence. Based on the significant findings that appeared in the study, the investigators crafted a Kapampangan Language Promotion Framework which may be used as a foundation in the implementation of language promotion programs that are anchored in the protection and promotion of Amanung Sisuan.

Keywords - Amanung Sisuan, Qualitative Phenomenology, Kapampangan Language, Kapampangan Literature, Kapampangan Spoken Word Poetry

Introduction

Poetry carries an influence that touches the entirety of a reader. It exhibits a sense of humanity as readers move from one verse to another. Wordplay, improvisation, rhyme, and repetition are the distinct characteristics of poetry that make it contrasting to other forms of literature (Poetry Foundation, 2021). The words of a poet are compelling when resonated cohesively, even more so if they are performed. Gone are the days when poetry was only intended for the reader's eyes. With the passage of time and the innovation of literature and arts, poetry has found its way to emerge from paper to the stage.

Spoken word, also known as performance poetry, is defined as any kind of poetry recited aloud. It encompasses poetry readings, jazz poetry, poetry slams, prose monologues, and hip-hop music (History of spoken word poetry, n.d.). Spoken Word Poetry has become a popular outlet for poets to perform their poems with appropriate diction and emotion. Further, it has become the medium that allows the poets to be open and true to themselves, molding spoken word poetry as an art of self-expression.

At present, different organizations are conducting spoken word poetry contests that give light to various themes that represent the institution's interest. There is social support through communication. Therefore, it catalyzes a forum for social awareness. In simpler terms, these performances exhibit the breadth and depth of the words spoken and emotions shown by the poet.

The celebration of World Poetry Day is being held annually on the 21st of March in commemoration of poetry's impact on cultural identity and linguistic diversity. The roots of the commencement of the event can be traced back to the 30th General Conference in Paris in 1999 when poetry was seen as a catalyst for reintroducing endangered languages. Moreover, the occasion is intended to give high regard to poets, reawaken poetry recitals, encourage the reading, writing, and teaching of poetry, and exhibit the correlation of poetry to the other forms of art. (UNESCO, 2021).

Poetry is bound by literary norms which include rhyme, verse, and meter. Poets use a variety of figures of speech to draw a vivid image in the mind of the readers. On the other hand, spoken word emphasizes freedom and wordplay, as it does not necessarily conform to a rhyme scheme. Moreover, the language used in spoken word is simple and clear, for it intends to gain the attention and engagement of the audience.

“Spoken word” or “spoken poetry” were made widely known in the 1980s. However, the birth of recited poems dates back to the presentation of epic poems like Homer’s Odyssey. In the course of history, poetry was fused into the theater, especially when music was made an accompaniment in Ode. (Douma, 2008)

Exploring the local setting, another form of poetry is Pulósa. According to Kapampangan Media (2019), it is a music genre that narrates humorous and entertaining stories by providing glimpses of Kapampangan life.

Poesiang Kapampangan in particular pays a decent amount of attention to the scientific underpinnings of meter and rhyme. This style can be traced back as far as the metrical romance’s influence on Kapampangans such as the kurirus (korido) and kumidya (komedya) (Kyoto Review of Southeast Asia, 2021).

Lacson (1984) added that Kapampangan young poets of today follow the style of the forefathers of Poesia by asserting their voices when performing especially during Aldo Ning Amanung Sisuan (Day of Kapampangan Language) which is being celebrated every August 31. The City Government of San Fernando held the spoken word poetry exhibit called “Pamigale Poesia at Pamipatindag” as a commemoration for Aldo Ning Amanung Sisuan. Councilor Harvey Quiwa mentioned that the event intended to promote the use of Kapampangan language in expressing emotions and creativity (David, 2018).

The core of any form of poetry is language. It plays a pivotal role in the expression of values and representation of social identity. However, “Resolution for The Enactment of Measures to Prevent The Death Of The Kapampangan Language” (2008) has stated that more than 50% of 7,000 languages around the world are in danger of disappearing. In a 2011 study of McClathy Washington Bureau, it has been discovered that 57% of the languages are safe, 10% are vulnerable, 11% are definitely endangered, 9% are severely endangered, 10% are critically endangered, and 4% are extinct. This is the result of the spasmodic use of most languages (Henson, 2008).

International Language Transmission distinguished six degrees of language endangerment. A “safe” language is characterized as a language that is being used by all generations. Therefore, there are no linguistic threats. A “stable yet threatened” language is being utilized in most contexts. However, the presence of a dominant language makes it difficult for the native language to be spoken in important contexts. A language is considered “unsafe” if most, but not all families in a community use the language. Thus, an unsafe language occurs when speakers use the language in limited social domains. A language is categorized as “definitely endangered” if the children are not being taught the mother tongue at home. This results in the parental generation as the youngest speakers of the said language. A “severely endangered” language describes a language that is being used only by the older generations. A “critically endangered” language is characterized by the great-grandparental generation as the youngest speakers of the language. However, they do not use it, as many people do not comprehend the language. An “extinct” language is the worst level a language may be, as there are no speakers to remember or use the language (Bradley & Bradley, 2019).

Linguistic extinction is not a recent phenomenon. Hoffman declared that a striking number of languages have already become obsolete. Languages are considered extinct if there is no occurring change or development, especially among their native speakers (Alshehri, 2016). Moreover, the lack of transmission to the children can also be an indicator of a language's death. Hence, language loss occurs when there are no speakers left to use the language.

Several kinds of research have been written concerning the status of the Kapampangan language. In fact, in 1985, Amanung Sisuan was predicted to vanish in a century. Twenty-two years later, experts claimed that after two decades, the Kapampangan language will no longer be spoken by its native speakers (Bas, 2007 as cited by Pangilinan, 2009).

According to Dr. Anicia Del Corro (as cited by San Andres, 2013), the Kapampangan language is regarded to be one of the endangered languages in the Philippines. She also stated three main reasons as to why languages become endangered e.g. colonization, standardization, and speaker loss. Del Corro (2001) added that language death begins when a language becomes in contact with a dominant language, then progresses as bilingualism, until the weaker language is barely understood. She stated that one of the primary reasons for Amanung Sisuan's endangerment is the proximity of the province's location to the nation's capital, which is Manila. It was discovered that the number of Tagalog speakers increased significantly in 1975, 1980, 1990, and 1995.

The death of a language marks the defunct cultural heritage, intellectual property, and social identity. Therefore, there needs to be a call for action. Henson (2008) stated that the linguistic genocide of the Kapampangan language can be prevented by political leaders and Kapampangan speakers themselves. Moreover, she emphasized the amendment of appropriate laws that encourage stronger patriotism and cultural appreciation. Republic Act No. 7104 which was signed by President Corazon Aquino on August 14, 1991, seeks to develop, preserve, and promote local Philippine languages. DO 74, s. 2009 or Institutionalizing Mother Tongue-Based Multilingual Education was passed in 2009, which mandates the teaching and utilization of the student's mother tongue in basic education. Angeles City in Pampanga has decreed Ordinance No. 424, Series of 2017 which institutionalizes the Kapampangan language as the city's official language along with the present national languages.

Amery (1994) (as cited by Alshehri, 2016) stated that there are strategies that aim to promote a language. "Learning through the language" is defined as the use of the language as a medium of instruction. However, this approach requires the participation of several fluent native speakers. On the other hand, learning "about" the language and learning "of" the language can easily be implemented through language awareness programs.

Contrary to the 1985 prediction of the Kapampangan language's extinction, SunStar (2020) declared that the Kapampangan language is far from being dead. In a competition held by the Center for Kapampangan Studies (CKS) of Holy Angel University, the institution has succeeded in promoting Kapampangan culture to the next generation. As a commemoration of Buwan ng Wika, 120 student participants have demonstrated their superb talents in Kapampangan poetry and Kapampangan music.

Due to the onset of the pandemic, the contest was administered digitally in place of a stage performance. However, this was not considered a hindrance in the event. In Tantingco's words, "online" is considered as the youth's natural habitat. Participants recorded their performances and submitted their entries online.

In both linguistic and literary landscape, copious gains can be extracted as to how poetry's influence and utilization aggrandize someone's vocabulary, upgrade diction and delivery and cultivate morphological knowledge (Lazar, 1996). Poetry elevates appreciation and awareness across cultures, establishes great civil connections among people, and upgrades their abilities through self-expression (Chamman-Taylor et al., 2016). That being said, Brown (2018) claimed that the use of poetry as an outlet for creativity, passion, culture, and tradition is a much-needed leap for a dying language.

The World Oral Literature Project which was established in 2009 also agrees that the use of oral literature which includes poetry and other literary genres like folk tales and music that entail both written, spoken, and performed, supports a language to continue to live and exist. Moreover, through performances of oral traditions and literature on various platforms in this modern-day era, it becomes a window for diversity, a center for appreciation, and an opportunity for cultural preservation (University of Cambridge, 2013).

Language and literature have been integral parts of humanity since the emergence of culture and community. What were once words on paper turned into emotive performances on stage through Spoken Word Poetry. Studies have declared that such performance aids in reintroducing and supporting the use of endangered languages. The participation of the spoken poets in this endeavor plays a huge factor in determining how they perceive Spoken Word Poetry competitions as means of language promotion. After all, emotion may be the root of poetry, but language is its core.

Crisostomo (2015) voiced a call for investigators to conduct additional critical studies on Kapampangan literature. In line with this, the investigators intend to spearhead the continuance of studies in Kapampangan literature by divulging into the experiences of Kapampangan poets. Moreover, the investigators are taking the opportunity to encourage the younger generations to participate in forums and programs that catalyze Kapampangan language appreciation and preservation.

The investigators are driven by the crucial need for critical studies about the Kapampangan language and literature. Since Kapampangan language is in danger of extinction while spoken word poetry is at the peak of the limelight, the investigators aim to merge the two aspects to shed the spotlight on what is often underrated—the wonders of Amanung Sisuan.

The general objective of this qualitative research was to explore the lived experiences of nine (9) young Kapampangan speakers who are between the ages of 16 and 25. They have also participated in two or more Kapampangan spoken word poetry contests and won (i.e. Champion, 1st runner up, and 2nd runner up) in one or more of the said contests. Specifically, the investigators sought to answer the following questions by exploring the lived experiences of informants via one-on-one online interviews: (1) How do the informants perceive Kapampangan Spoken Word Poetry contests: (1.1) as platforms for spoken poets to develop their talents (1.2) as programs for language promotion? (2) What are the challenges that the informants have encountered in their endeavor? (3) How did the informants address the said difficulties? (4) Based on the findings of the study, what language promotion program framework may be developed?

Methodology

To achieve the objectives of the study, the investigators found it suitable and appropriate to execute a qualitative-phenomenological approach. As stated by Nelson (2011), this approach is a type of qualitative investigation that aims to highlight the lived experiences of the target population. Hence, informants must have extensive experience on the phenomena being studied for their responses to be considered valid.

According to Reeves et al. (2008), qualitative research demands a purposive selection of subjects or informants. Creswell (1998) recommended five (5) to twenty-five (25) informants to achieve data saturation. Concerning the notion, the investigators of this study conducted online interviews with nine (9) Kapampangan Spoken Word Poetry Winners. The informants came from the top 3 winners (i.e. Champion, 1st runner up, and 2nd runner up) of the said contests. Regardless of gender, the informants of this study were between the ages of 16 and 25. Most importantly, they had consistently and continuously participated in Kapampangan Spoken Word Poetry Contests. Therefore, they had joined two or more of these competitions. Considering the criteria aforementioned, the investigators were able to specify the relevant information from the target informants.

According to Easwaramoorthy et al. (2006), an interview is a method of gathering information from an individual by having them orally respond to questions. One-on-one interviews were used instead of a Focused Group Discussion to know the story of each participant. This was to guarantee that the informants were given equal opportunities to share their insights and experiences.

Bhat (2020) stated that a questionnaire is a set of questions that intends to collect information from a respondent. The investigators utilized semi-structured interviews thus, they asked a set of predetermined questions. However, the investigators still asked supplementary questions to be able to gather in-depth information from the informants.

The importance of open-ended questions to this study is that the respondents were allowed to react in their way. They were given the chance to express themselves—whether it's to vent about a negative experience or to applaud a positive one. Thus, the relevance of open-ended questions is that the respondents had complete discretion in what they want to say and were not constrained by a limited number of choices.

The investigators have determined their informants from the Facebook posts of different universities around Pampanga. However, an approved letter was provided to each participant to further inform them about the study. Interviews were conducted based on the mutual availability of the investigators and the informants. Following the safety protocols during the pandemic, interviews were held through the informants' chosen messaging or video conferencing applications. The interviews lasted for fifteen (15) to thirty (30) minutes, which allowed the informants enough time to respond to questions and narrate their journey as active and consecutive informants in Kapampangan Spoken Word Poetry competitions. Additionally, none of the informants wished to be removed from the study. The investigators value the informants' consent and privacy, thus, all gathered data was treated with the utmost confidentiality.

In a phenomenological type of research, the analyzing and synthesizing of data is done by employing thematic analysis. This includes steps of an approach that is flexible for analyzing data to search for variables, themes, and codes that stand out (Braun and Clarke, 2006).

The investigators followed the following steps:

1. **Familiarization of Data**. The investigators crafted a transcription of the informants' data and interview recordings. Informants were labeled as P1, P2, P3, P4, P5, P6, P7, P8, and P9.
2. **Coding**. Key points and codes were identified accordingly.
3. **Generating Themes.** Several similar codes were combined to create a theme.
4. **Reviewing Themes**. Investigators compared, combined, and created new ones to determine which themes are useful and which are not.
5. **Defining and Naming Themes.** Themes were defined and named in the final list. Further, concise and easily understandable names were designated to the themes.
6. **Writing Up.** The analysis of data was formulated and interpreted. The results were explained and accompanied by related articles.

Results and Discussions

Informants' View on Kapampangan Spoken Word Poetry Contests as Platforms to Develop their Talents. Pampanga's Ari ning Parnaso (King of Parnassus) Renato Alzadon advised the Kapampangan youth to incorporate Amanung Sisuan in the exhibition of their talents (as cited by Calayag, 2020). One way of doing so is to participate in Kapampangan Spoken Word Poetry competitions administered by different organizations. Despite the predicaments brought about by the pandemic, Kapampangan institutions remain steadfast in organizing these events online. The analysis of the results from the interviews led to the construction of the following themes:

Theme 1. Widen Own Linguistic Knowledge and Literary Understanding.

It has been noted by Riley (2016) that competitions serve as a "training ground for excellence." That being said, through Kapampangan Spoken Word Poetry competitions, informants can sharpen their own as well as others' knowledge in linguistic and literary aspects. As the informants showcased their talents, they were able to influence a large number of individuals. After all, being a poet entails influencing people and educating the community. Among the significant responses of the five (5) out of nine (9) informants that resulted in the creation of this theme are:

> "Wa, makasawup lang tutung maragul bang lumawak ka belwan, ana pen." – I2 (Yes, they help, they help a lot. Your knowledge will be expanded, as they say.)

> "...talagang jumojoin nako para ano madagdagan yung alam ko…magiging mas maalam ka sa literatura na meron kayo." – I3 (I really joined these events so I can know more...I will be more knowledgeable about our literature.)

> "…kapag talaga inaral mo 'yung Kapampangan Spoken Word Poetry, which is andami mong matututunan, marami kang malalaman na salita, marami kang malalaman kung paano mo siya bigkasin." – I4 (If you really study Kapampangan Spoken Word Poetry, you will learn a lot, you will know a lot of words and how they are pronounced.)

> "Mitatayis ku belwan…" – I5 (My knowledge is sharpened.)

> "…bawat i-join ko, may natutunan po ako…Talagang tuturuan po kami ng tamang… tamang pagpronounce yung tamang, pag pag hinto, pag lakas ng boses." – I6 (Whenever I joined, I learned something. They really teach us the proper pronunciation, pause, and intonation.)

As stated by Barack (2019), creating and writing any poetry supports the development of literacy skills. In that case, through these competitions, informants can enhance their speaking skills in delivering their literary pieces as well as improve their talent in writing creative poems.

Theme 2. Develop Confidence and Skills.

Participating in Spoken Word Poetry competitions fosters a range of qualities and skills, including productive skills such as speaking and writing. Thus, by creating a safe space and supportive environment for spoken word poetry performances, informants can breed confidence and develop trust in themselves. The following key points from six (6) out of nine (9) informants have been used in the construction of the aforementioned theme:

> "I can speak with confidence in public, 'yun yung pinaka impact sa 'kin. 'Yun yung tumulong to hone my talent." – I1 (I think this has been the impact. I can speak with confidence in public, and that has been its major impact. That was what helped to hone my talent.)

> "Malaki yung naging impact ng pagsali ko sa spoken word poetry. First te, sa self-confidence...lalake talaga yung parang... tiwala mo sa sarili mo." – I3 (My participation in spoken word poetry had a big impact. First is self-confidence. No matter how little, as long as you've tried and practiced, even if you don't intend to, your self-confidence will be boosted.)

> "…marami pong nadevelop, hindi lang yung confidence ko, ganon." – I4 (There are many (aspects) that were developed, and not just my confidence.)

> "…aside from it builds my confidence, it also develops my voice uhm through writing…" – I7

> "It is enhancing my skills when it comes to poetry and it is also boosting my confidence." – I8

> "Pauli na nitang akakit kung dakal makapanalbe keng gewa ku at gagawan maragul nang bage ita at saup keng sarili ku ban milako dine pangaras keng pamanyulung keng pakamalan a labuad Kapampangan at king kultura na niti." – I9 (Because I see a lot of people watching my performance, this has been a big help to remove my shyness with regard to promoting Kapampangan language and culture.)

It is undeniable that poetry has long been regarded as a means of finding one's voice—both literally and metaphorically (Wilson, 2007). Further, Michalko (2012) states that Spoken Word Poetry has been regarded as a language for youth to define themselves and function as reflections of their realities and experiences. Therefore, it serves as a platform in building confidence, finding oneself, and allowing voices to be heard.

Theme 3. Opportunity to be Mentored by Kapampangan Experts.

In their journey as poets, they encounter mentors or veterans who will provide them guidance and support. Furthermore, it unlocks doors of opportunities for the informants as they get motivation and inspiration from the experts. The significance of this theme is emphasized by the comments of three (3) out of nine (9) informants:

> “…Spoken Poetry contest also gives me the opportunity and avenue to meet other individuals na pwedeng tumulong sa aken, na pwedeng mag mentor sa aken…Dito naman sa Kapampangan Spoken Word Poetry, 'yung Director of Kapampangan Studies yun nakikilala ko na rin sila.” – I1 (Spoken Poetry contest also gives me the opportunity and avenue to meet other individuals who can help me as my mentors. I even met the Director of Kapampangan Studies because of Kapampangan Spoken Word Poetry.)

> “…basta yung founder ng Amanung Sisuan SPW and Sinukuan, yung babae po. Last year po ‘yun, Sinukuan SPW including Amanung Sisuan te, tas si Sir Ryan Perez po yung mentor.” – I3 (Last year, I met the founder of Amanung Sisuan SPW and Sir Ryan Perez who is my mentor.)

> “Na-meet ko before dun sa last contests which is yung Poeta Laureado, isa siya dun sa mentor ng Pamaglalang Kawatasan Kapampangan. Pinakilala po kasi kami nung president non.” – I4 (I have met the Poeta Laureado during the last contests. He was one of the mentors of Pamaglalang Kawatasan Kapampangan. Our president introduced us to him.)

Mentors' responsibility does not merely rely upon providing immediate and direct coaching to the mentees, but also upon provoking the intellect of mentees (Reh, 2019). Captain Shantanu Anand stated that after involving himself in a group of veterans, his aim became more radiant and vivid which contributed to the development of his credence (as cited by The Climber, 2018).

Theme 4. Recognition as Secondary Motivation.

Through several Kapampangan Spoken Word Poetry contests, informants have exhibited their outstanding performances which leave the crowd and judges in awe. As a recognition of their admirable talents, winners are given awards in the form of certificates and cash prizes. For instance, the Online Kapampangan Spoken Word Poetry Competition (2020) which was organized by Holy Angel University and Center for Kapampangan Studies granted the champion a certificate and a cash prize of Php10, 000 (SunStar, 2020). However, six (6) out of nine (9) informants have claimed that winning is not their top priority in joining these contests. This theme is actualized from the following narratives:

> “Ah, syempre ne, aside karetang prizes ampo pang galal a bibye da…Bonus nemu kasi itang sinambut ka e…” – I2 (Of course, aside from the prizes and rewards that they give...Winning is just a bonus.)

> “…hindi po ‘yung pagkapanalo eh…at least kung manalo ako o matalo nakita mo mismo sa mga mata mo na naintindihan nila yung gusto mong ideliver.” – I3 (It’s not about winning...At least, whether you win or lose, your own eyes have seen that the audience understood what you meant to deliver.)

> “Kahit hindi ka manalo, matalo ka man ganun, ano ka pa rin, blessed ka pa rin…” – I4 (Even if you lose, you are still blessed.)

> "Actually, every part of participating kahit yung pagjoin lang sobrang tini-treasure na...aside from winning of course." – I7 (Actually, every part of participating, including the mere act of joining, is treasured...aside from winning, of course.)
>
> "With that, participating is no longer about the prize." – I8
>
> "Kaku aliwa naman itang galal o perang ibie da yang makapasno pagal ampong makibie tula keng obrang gewa ku." – I9 (It's not the reward or cash that they give that relieves fatigue and gives joy to the effort that I've exerted.)

Informants' Perspective on Kapampangan Spoken Word Poetry Contests as Programs for the Promotion of Amanung Sisuan.

In a desperate attempt to bring attention to the status of the Kapampangan language, the Akademya Kapampangan on January 14, 2006, wrote a letter to the congressman of the First District of Pampanga. As stated in the letter, the lack of action will result in the death of the Kapampangan language (Bas as cited by Laxamana, 2007). Fortunately, with the amendment of Provincial Board (PB) Resolution 1193, August 28 was designated as Aldo ning Amanung Sisuan. The province's Language Council was also the result of this mandate (SunStar, 2010). During the Aldo ning Amanung Sisuan, competitions are held which aim to celebrate the rich and distinct language and culture of Pampanga. One of these competitions is the Kapampangan Spoken Word Poetry contest. The following themes emerged as results of the informants' accounts:

Theme 1. Drive to Help Revive Amanung Sisuan.

With the formidable risk of the Kapampangan language's extinction, Kapampangan Spoken Word Poetry winners are driven by the crucial need to promote and revive Amanung Sisuan. Kapampangan poets had heard the call — the plea of the Kapampangan Language that is slowly being left behind. Four (4) out of nine (9) of the informants' statements that resulted in this theme include:

> "…kase 'pag ginagawa mo na 'yung contest at 'pag ginagawa mo na 'yung Spoken Poetry, maniniwala ka sa sarili mo na isang akong parte to revive the Amanung Sisuan." – I1 (...because when you join Spoken Poetry, you believe that you are a part of reviving Amanung Sisuan.)
>
> "…ing peka-driving force ku bakit ku makyabe syempre, itang, itang message mu, itang advocacy mu kareng kayanakan, kareng memalen, kung nanu ya ing buri mung paabut karela, makananu ya kalagu, kasanting ing Amanung Kapampangan, ing kulturang Kapampangan." – I2 (My main driving force as to why I joined these events is definitely the message and the advocacy that you intend to share to the youth and to the Kapampangans, specifically on what you want to tell them—how beautiful Amanung Kapampangan and Kapampangan culture are.)
>
> "Metung mu ing sangkan nung bakit ku makipagliligan iti ban e sayangan ing oportunidad mapagkalub kanaku ban kanita e ya misundu pangalumpawi ing Amanung Sisuan, ing Amanung Kapampangan." – I5 (There is only one reason as to why I join Kapampangan Spoken Word Poetry contests, and it is to not waste the opportunity to prevent the death of Amanung Sisuan, of Amanung Kapampangan.)
>
> "Mumuna ing awus ning kulturang mababating. Ing lua ning amanu a maginalu. At ing kekatang paintungul a tune malabug pauli ning pamangalinguan tamu keng sarili tang ibatan at tune pangatau." – I9 (First is the call of the dying culture, the tears of the moribund language, and our blurry path due to the way we forget our roots and our true identities.)

Eugene Ngo (2019) argued that the Kapampangan language is at the brink of extinction, and the future of the language lies in the hands of Kapampangan speakers themselves. The disintegration of

Amanung Sisuan will result in the loss of Kapampangan culture. However, the realization of the problem alone is not enough; the knowledge of the issue should also be brought into action — or better yet, on stage.

Theme 2. Ignite Kapampangan Youth's Awareness and Interest.

Kawatas-watasan has been prevalent among the younger generation of Kapampangans who seek to establish their identity on stage. With their play of words and emotive actions, the informants have raised their voices to raise awareness and interest among Kapampangan youth. This theme is established using the following narrations of six (6) out of nine (9) informants:

> "These Spoken Poetries contribute to the youth kasi nagiging aware sila, nalalaman. Minsan yun nga 'yung nadidiscover mo." – I1 (These Spoken Poetries contribute to the youth because they become aware. Sometimes, this is what you discover.)
>
> "…dakal pa rin talagang kayanakan a bisang mabyasang Kapampangan, dakal pa mu rin kekatamu…itang pahulagan de, pakamalan de ing kulturang Kapampangan." – I2 (There are still a lot of youth who want to learn Kapampangan. There are still a lot of us who value Kapampangan culture.)
>
> "…nae-encourage nga po yung ano…yung mga kabataan." – I3 (The youth are encouraged.)
>
> "…may mga kabataan non na sila mismo 'yung maga-approach na gusto nilang itry 'yon." – I4 (There are some youths who approached and told (me) that they want to try it.)
>
> "Kalupa ra reng anti kaniting programa mikakadiwa la reng kayanakan nung nanu ya talaga kabaldugan ing sabi tang menan." – I5 (Because of these programs, the youth's spirit is awakened to what our language really means.)
>
> "And contests where they need to perform and use our Amanung Sisuan can help our young generations especially the Kapampangan youths to start loving what we have because they will be going to realize that this is the reflection of who we really are and this our identity and responsibility to nourish and preserve it." – I7

120 young Kapampangan poets and songwriters surprised the Center for Kapampangan Studies when they showed enthusiasm in joining its online Kapampangan Spoken Word Poetry contest. CKS Director Robby Tantingco stated that the young generation is indeed interested in using the Kapampangan language in their creative endeavors. He added that what young Kapampangans need now is continuous support and encouragement. (SunStar, 2020).

Theme 3. Engagement of Public Through Social Media.

The onset of the pandemic has prompted several spoken word poetry contests to shift from face-to-face to virtual ones. As a result, it also has opened a wide variety of audiences to cater to its purpose, which is to promote and advocate the use of a less-spoken and endangered language like Kapampangan. Five (5) out of nine (9) informants concur to the explained theme, stating:

> "'Through the help of social media and other medium and platforms we may able to share the dying language, the dying words…"– I1 (Through the help of social media and other mediums and platforms we may be able to share the dying language, the dying words…)
>
> "Tapus deng mekapanalbe karetang performance, deng mekapaglike, mekapagshare, thousands la…Dakal ing makaramdam e, dakal ka malyaring i-inspire aliwa mu ring kayanakan, nune ring buung memalen ning Pampanga." – I2 (Thousands were able to

watch, like, and share the videos. There were a lot of people who you can inspire, and not just the youth, but also your fellow Kapampangans.)

"…once na nag-upload ka ng video na about sa ganon and maraming nagshare, maraming nagcomment, and maraming naglike, which is marami ding makakakita, makakapanood." – I4 (Once you upload the video and a lot of people shared, commented, and liked it, many can see and watch it.)

"Makikilala ing kekatang kultura king miyaliwang suluk ning labwad Kapampangan pauli ning anti kaniting kaganapan." – I5 (Our culture is being recognized in different corners of the world because of these events.)

"…through shares online, a lot of people can watch your performance." – I7

As attested by Maniago (as cited by Novio, 2017), it is a fact that the utilization of social media applications like Facebook and Youtube are effective ways to promote the advocacy of extensive exploration of the Kapampangan language and culture, especially for the youth. In addition, Tantingco (as cited by Calayag, 2020) claimed that the online world is a place that is very innate to younger generations.

Informants' Challenges Relative to Joining Contests.

Winners, like any other participant, have faced challenges in their journey towards triumph. While some may give up and be burned in the fire, winners had chosen to be forged in the heat to come out stronger and wiser. Considering the informants' commentaries, the following themes came into view.

Theme 1. Difficulty in Poem Construction.

Sufficient motivation and abundant mastery in writing are two vital factors that can lead a writer to success (Martin and Collie, 2019). However, the two said factors can also be the same struggles faced by poets. These impediments cause an artist's block as the right vocabulary that is needed might be difficult to recall. To substantiate that claim, four (4) out of nine (9) informants of the study mentioned:

"…'yung pinakamatinding challenges is 'yung gumawa ka mismo ng tula, 'yung pagsulat ng tula pero may mga akmang words pero hindi mo kayang isulat kase hindi mo alam 'yung meaning kase unti unti nang nalilimutan." – I1 (The poignant challenge is the poem construction, when you cannot think of exact words to write because these words are slowly being forgotten.)

"…e makanta kasagli ing gagawang piyesa lalu na king Kapampangan. Mas kakasaglian ku pang gawang piyesa king Tagalug kesa king Kapampangan." – I2 (It is not that easy to write a poem especially in Kapampangan. I find it easier to compose in Tagalog than in Kapampangan.)

"Iba-iba po kasi yung nararanasang hirap kapag nasabi mong sasali ka na e. Una po, pagi-isipan mo 'yung script." – I6 (There are varying challenges in joining these events. First, you have to think of a script.)

"Based on my experiences the most challenging is the part on choosing that words…yung mahirap yung ibang Kapampangan words." – I7 (Based on my experiences, the most challenging part is word selection...some Kapampangan words are difficult.)

Theme 2. Internal and External Discouragement.
Even though these successful poets obtain an amount of success, their vulnerability manages to prevail. Considering the testimonies of three (3) out of nine (9) informants, the formed theme is highlighted:

> "Kapag amananmana kung ala yang datang, tuknangan ke ing susulat ku and that's the challenge for me — discouragement and the courage to write Poetry." – I1 (When I realize that it lacks impact, I stop. That's the challenge for me — discouragement and the courage to write Poetry.)

> "Dakal tawu ing sasabi at e sangayun king pamakyabe ku kareng ligligan pauli ning manong ya kanu at ala kung akwa." – I5 (A lot of people are not in favor of my participation in these contests because they say that it is unpleasant and unrewarding.)

> "Ere buri reng tau o reng ukum." – I9 (The audience or the judges do not like my performance because I try to relive the traditional ways in performing Kapampangan poetry.)

Dreikurs (as cited by Anderson,1977) argues that some rigors are frequently rooted in a cast of discouragement. Therefore, delivering an excellent performance appears hard to do since these poets are bound to encounter criticisms and evaluations from themselves, judges, and the audience.

Theme 3. Social Media Popularity Criteria.

On Panimanman's Facebook Page, one of their special awards for the Kapampangan Spoken Word Poetry contest in 2021 is titled the "Kulait da ring Tau." Social media popularity contests have been seen as an inconvenience by many contestants specifically for those who put in extra effort in their social media accounts to gain likes, comments, and followers right away to win. The aforementioned narratives of three (3) out of nine (9) informants support the established theme:

> "…yung pinaka-challenging na nangyari is yung paramihan po ng likes ganun. Parang nakakapressure po siya sa part mo na contestant ka na yung titingnan mo talaga nun…" – I4 (The most challenging would be the competition on the number of likes. It's pressurizing on the part of the contestant because you really check it.)

> "Ang ano kasi, masakit lang, yung online voting is mas mataas pa yung percentage kaysa sa mga vote ng judges. Kasi syempre kapag online voting isang factor na 'dun yung 'pag famous ka or marami kang kilala." – I7 (What hurts is that the percentage of online voting is higher than the votes of the judges. In online voting, one of the factors that is considered is if you are famous or if you know a lot of people.)

> "We can definitely say that through likes there are contestants that are losing hope. They will always say that 'Enaku manyambut kanini, likes nanaman ing basehan.'" – I8 (We can definitely say that through likes, there are contestants that are losing hope. They will always say that 'I won't win anymore, the number of likes are the basis again.')

Theme 4: Material Problems.

Usually, Kapampangan Spoken Word Poetry contests require poets to take their costumes into account. Poets' appearances should capture the audience's attention even before they open their mouths. Nowadays, performances are recorded and eventually posted online. Therefore, poets also need to consider the quality of their cameras and mics. This theme is validated by the following key points from three (3) out of nine (9) informants:

> "Una 'yung mga logistics…nung face to face kakailanganin mong isusuot 'di ba? Ngayon naman ang contests natin ang mode natin digitalized na. Kakailanganin mo ng high end na camera kasi di pwedeng 'yung puchu puchu lang. Kakailanganin mo ng lapel and microphones." – I1 (First is the logistics. During face-to-face contests, you need costumes, right? Now that the contests are digitized, you need a high-end camera, because a low-quality camera is insufficient. You need to have a lapel and microphones.)

"Tapos kapag magvi-video na, pagi-isipan mo pa anong susuot mo." – I6 (When you are filming it, you still need to think of your costume.)

"Alakang makaying gamit a gamitan para sumanting yamo ing video mu. Uling akurin yang mag-edit emakaying masanting keng mata dareng ukum at manalbe." – I9 (Because I am the one who edits my videos, it does not look that pleasing to the eyes of the judges and audience.)

Informants' Dynamic Strategies to Address the Challenges.

Challenges are only one side of being a Kapampangan Spoken Word Poet, for it is their strategies that tell the whole story of their victory. It cannot be denied that although their talents are indeed outstanding, it is their dedication and perseverance that made them win. The following themes emanated from the informants' narratives:

Theme 1. Guidance from Kapampangan Experts/Elders.

According to Brian Herbert (n.d.), a person's willingness to learn is a more significant factor than having the skills and ability to learn. This notion conveys that asking for guidance is a simple gesture for people who want to learn. Moreover, this is a courageous act of admitting someone's lack of skills. Thus, when things go wrong, people will eventually ask for help. The following codes from three (3) out of nine (9) informants were used in the formation of this theme:

"So ang last resort mo, pumunta ka sa mga nakakatanda, sa mga matatanda, sa mga expert sa language. Sila 'yung tatanungin mo." – I1 (Your last resort would be asking the Kapampangan elders and experts.)

"Kung hindi po ako satisfied na maganda siya, papacheck ko po sa kuya ko, sa mama ko, sa tatay ko, papabasa ko po sa kanila, tsaka sa mga friend ko po." – I6 (When I am not satisfied with my poem, I will ask my family and friends to read and check it.)

"I approach the Kapampangan elders and ask them kasi I believe that they are smarter when it comes to deep or right Kapampangan words." – I7 (I approach Kapampangan elders. I ask them because I believe that they are smarter when it comes to deep or right Kapampangan words.)

In an article titled "Kapampangan Folk Music, Games, and Theater: An Endangered Oral Traditions" (2021), it is stated that Kapampangan youth need to unveil and acknowledge Kapampangan oral traditions which were preserved by the dedication and efforts of Kapampangan elders. Even the Kapampangan Dictionary recognizes the competence and eloquence of the Kapampangan elderly (Forman, 2019).

Theme 2. Personal Dedication and Persistence.

In stage performance contests like Spoken Word Poetry, pressure is an indisputably inevitable element since conducting or participating in such is beyond merely providing entertainment to the audience. However, with a significant end in mind, poets learned the rudiments of overcoming performance challenges. Despite the discouragements, the aim remained explicit—to eloquently perform the message. Three (3) out of nine (9) informants shared the same sentiments based on their comments:

"…whatever the hindrances, malinaw sayo na makapag-perform at maideliver mo yung piece mo, 'yun 'yong pinaka goal mo." – I3 (Whatever the hindrances, it must be clear to you that your goal is to deliver and perform your piece.)

"Tikpan ko reng kakung balubgug at e ku binalike ban pansinan ko reng mamatbat kaku ban matwag. Sindu ke ing kakung pamaglakbe ban miras king ustung parasan." – I5 (I covered my ears and did not pay attention to those who wanted me to fail. I continued my journey to reach the right destination.)

"I just follow the flow, win or lose, I know that I did my best." – I8

Proposed Language Promotion Program Framework.

With the surge of young Kapampangan poets being interested in joining Kapampangan Spoken Word Poetry Contests, more attention must be granted to the formation and administration of these events. These competitions do not only exhibit Cabalens' talents but also provide a glimpse of Pampango's cultural heritage.

Pythagoras regarded the circle as the most appropriate symbol to represent creativity (Beyer, 2019). Moreover, the circle symbolizes the shape of a medal which is often awarded to triumphant winners. The participant is placed in the center of the circle, for it is the participant who is the core of a language promotion program.

The investigators have utilized the color maroon for it has been recognized as one of the prominent colors that represent the strong personality, ambition, and inspiration (Braam, 2020). They carry a torch that illuminates the life of Amanung Sisuan every time they perform on stage. That being said, the investigators used the color gold as it symbolizes success, influence, and confidence (Olesen, 2013).

The right portion of the larger maroon-hued circle presents the perceptions of youth on Kapampangan Spoken Word Poetry Contests as a platform to develop their talents and as an artery in language promotion. On the flip side, it entails the various challenges encountered by youths towards success and their relative strategies to remain undefeated. In addition, the arrows illustrated by the investigators along with the elements inside the loop intend to show the movement and direction (Symbol Sage, 2021). Through these, themes concerning the ideal and social factors of these programs emanated. Suggesting an amount of attention from organizers should be put into account to be able to maximize the objectives concerning language promotion.

Figure 1. Language Promotion Program Framework

Conclusion and Recommendations

Summary of Findings

After an in-depth process of collecting and analyzing data, the investigators have come up with the significant findings of the study.

1. Informants' View on Kapampangan Spoken Word Poetry Contests
   1.1 as a Platform to Develop their Talents

   Kapampangan Spoken Word Poetry contests are avenues where young poets widen their own and others' linguistic and literary understanding, develop their skills and confidence, be granted the opportunity to learn from Kapampangan experts, and be recognized.

   1.2. as a Program to Promote Amanung Sisuan

   Kapampangan Spoken Word Poetry contests are directed towards the contribution to the revival of Kapampangan language, the awakening of Kapampangan youth's awareness and interest with Amanung Sisuan, and the widening of the audience, especially in social media.

2. Informants' Challenges Relative to Joining Contests

   Internal and external factors such as difficulty in poem construction, discouragement, social media popularity criteria, and material problems are the challenges that the informants have encountered in their creative endeavor.

3. Informants' Dynamic Strategies to Address the Challenges

   Informants have responded to the challenges by seeking guidance from Kapampangan experts/elders as well as exhibiting personal dedication and persistence.

4. Proposed Kapampangan Language Promotion Program Framework

   Based on the findings of the study, the investigators have crafted a language promotion program framework that considers the study's relevant variables.

Conclusions

1. The informants share a common perspective about Kapampangan Spoken Word Poetry contests as a platform to develop their talents and promote Kapampangan language.

2. The informants were confronted with internal and external conflicts in their creative endeavor.

3. To address the aforementioned circumstances, the informants have employed dynamic strategies like seeking guidance from Kapampangan experts and elders as well as demonstrating personal dedication and persistence.

4. A language promotion program framework was constructed to illustrate informants' perspectives, challenges, and strategies in joining Kapampangan Spoken Word Poetry competitions.

Recommendations

1. Kapampangan institutions that intend to promote Amanung Sisuan may emphasize the participation of Kapampangan youth, as they are the ones responsible for nurturing and protecting the Kapampangan language from extinction.

2. Students, adolescents, or anyone interested in participating in any Kapampangan Spoken Word Poetry competitions may prepare themselves by divulging the extremities of Kapampangan language and Kapampangan literature.

3. Kapampangan organizations may offer forums, seminars, training, and workshops for Kapampangan Spoken Word Poetry winners to accentuate the continuation of their creative endeavor with Amanung Sisuan.

4. Kapampangan Spoken Word Poetry organizers may consider the crafted language promotion program framework to become apprehensive about modifying their standards to broaden and strengthen the promotion of the Kapampangan language and culture.

5. Future investigators may explore the lived experiences of Kapampangan Experts to discover their perspectives on Amanung Sisuan as well as the construction and administration of Kapampangan Language Promotion Programs.

Acknowledgment

The investigators would like to express their earnest gratitude first to the Lord for providing them sufficient knowledge and wisdom to accomplish this work.

They would also like to thank their families and friends for their consistent financial and moral support for the completion of this research project.

Moreover, they would like to profess their gratitude to their thesis adviser, Dr. Mark Joseph B. Layug, thesis teacher, Dr. Mildred Crisostomo, and the College of Education faculty for making this study possible and for constantly guiding the investigators towards their professional and personal growth.

Most of all, the investigators would like to acknowledge the informants who agreed to narrate their experiences and share their insights. If not for their meaningful responses, this study could not have been completed. We owe this humble work to each of you.

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The Level of Job Motivation of the Employees Evaluation of Quezon City University

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Abstract - The study sought to assess the extrinsic and intrinsic factors and job performance of the respondents on the level of job motivations of the employees' evaluation of Quezon City University (formerly Quezon City Polytechnic University), and the significant of intrinsic and extrinsic rewards with employee job satisfaction and employee commitment. Job satisfaction and employee commitment refers to employee attitude. When the organization focuses on employees' positive attitudes, the results will also be found in positive manner. There are great evidences available in literature which defines the strong relationship between intrinsic, extrinsic rewards, and employee job satisfaction and organizational commitment. The respondents were individual from different department of Quezon City University (formerly Quezon City Polytechnic University). There were 130 respondents who participated in this study. The statistical tools utilized in the study were frequency and percentage, weighted mean, and one way ANOVA. The researcher used the systematic random sampling to individual employees from different departments. In this study, a researcher made questionnaire was used to gather the primary data. The survey questionnaire was formulated based on the related literature gathered. This instrument was divided into three (3) parts. The first part aims to survey the profile of the respondents. The second part is knowing the aspects of job motivation of the employees, and the third part is the significant difference on the respondents' assessment on the level of job motivation of the employees' evaluation of Quezon City Polytechnic University when they group according to profile. After the data gathered, they were complied, sorted out and tabulated. They were subject statistical treatment in order to answer the questions proposed in this study.

Keywords - Extrinsic, Intrinsic, Performance Evaluation, and Job Motivation.

Introduction

Every organization has three types of general resources–physical, financial, and human. The most critical one is, no doubt, the organization's human resource comprised of employees who can accelerate the process of organizational development or can demolish the organizational progress. Moreover, human resource proves to be the center of organizational resources. Hence, subsequent to safeguarding the basic interests of an organization, securing both job satisfaction and job motivation of employees must be a priority in any organizations. In private and public tertiary institutions all over the world have the prime aim and objectives of improving and impacting knowledge through teaching, Work motivation and job performance have been emerging constructs in past few decades. This has been observed in organizational set ups that work motivation and performance level is strongly associated. Generally speaking motivation can be defined as a set of forces that cause people to behave in a certain way. It is always goal directed. Motivation is a base for present and future technology, essential for production. It sets challenging goals for workers. It can only be inferred, not seen. Work motivation is defined as a process to energize employees to the work to achieve a goal through a specific path (Sheikh, 2012).
Motivation is a central and vital component and a key contributor in the job satisfaction of an employee. Motivating employees has become one of the most significant and most demanding activities for the human resource management in any organization. Undoubtedly, efficiency suffers with unmotivated personnel. That is why organizations invest in effectual strategies to get motivated workforce to compete in market. Salary alone does not prove to be a vital motivator for everyone in an organization since various factors motivate people differently depending on the nature of an organization and its key contributors in developing a learning environment.

Methodology

This study used the descriptive method of research which describes the nature of a situation, as it exists at the time of study. The descriptive research involves the collection of data in order to test the hypotheses and to answer questions concerning the current status of the subject study (Santarin, 2005). According to Best (2005), a descriptive method of research is concerned with the condition or relationship that exists, practices that prevail, beliefs, points of view, or attitudes that are held, processes that are going on, effects that are being felt or trends that are developing. The researcher also solicited ideas to give solution to the problem. Survey method is found to be an easy way of collecting data to determine the awareness of the respondents. It was a valid method for researching specific subjects and as a precursor to more quantitative studies. While there were some valid concerns about the statistical validity, as long as the limitations were understood by the researcher, this type of study was an invaluable scientific and random tool. Although results are always open to question and to different interpretations, there was no doubt that such is a helpful tool in performing a research.

Results and Discussions

The study sought to assess the extrinsic and intrinsic factors and job performance of the respondents on the level of job motivations of the employees' evaluation of Quezon City Polytechnic University, and the significant of intrinsic and extrinsic rewards with employees' job satisfaction and employees' commitment. Job satisfaction and employees commitment refers to employee attitude. When the organization focuses on employees' positive attitudes, the results will also be found in positive manner. There are great evidences available in literature which defines the strong relationship between intrinsic, extrinsic rewards, and employee job satisfaction and organizational commitment.

Profile of the Respondents According to Sex, Age, Civil Status, Highest Educational Attainment; Job Position Level, Average number of promotion in the last three years, Length of service.

The following are the profile variables of the respondents of Quezon City Polytechnic University employees:

In terms of sex, out of 130 respondents, female respondents dominate with 48.5% (63), while 40.8% (53) are represented by male respondents; 10.8% (14) had no response. According to Wiley (1997), women placed greater importance on appreciations of work done, interesting work and more importance on good working conditions, whereas males, on the other hand, place more emphasis on interesting work.

In terms of Age, out of 130 respondent, 43 (33.1%) dominated both aged 32-38 years old and 39-45 years old respondents followed by 18-24 years old with 19 (14.6%), respondents age 25-31 years old with 18 (13.8%), respondents age 46-52 years old with 5 (3.8) and 2 (1.5%) have no response.

In terms of civil status, out of 130 respondents 69 or 53.1% are married, while 43.8% (57) represent single respondents, followed by .8% (39) legally separated respondents 0.8% (1), and 0.8% or 1 widower.

In terms of highest educational attainment, 130 respondents were dominated by those with master's degree with 54.6% or 71, followed by those with master's unit (36 or 27.7%), with doctoral units (11 or 8.5%), doctorate degree has (4 or 3.1%), college graduate (7or 5.4%), and with (1 or 0.8%) while 0 are college undergraduate, vocational and high school graduate. This means that master's degree or high education will be important in the academe and or in the offices.

In terms of job position level, out of 130 respondents the majority of the respondents are rank and file with a total of 95 (73.1%) of the 130 respondents, followed by supervisor 19 (14.6%), top management 0 (0.0%), and 16(12.3%) for the No-response.

In terms of average number of promotions in the last three years, out 130 respondents, 76 (58.5%) had been promoted 1time, followed by 9 (6.9%) had been promoted 2-3 times, 1 (0.8%) had been promoted 4-5 times, while 0 (0.0) were 6 to 10 times and 44 (33.9) with no response.

In terms of length of service, out of 130 respondents, 28 (215%) rendered 2-3 years, followed by 26 (20.0%) with 6 months to 1 year in service, 16 (12.3%) and 16 (12.3%) both with 4-5 & 8-9 years, 9 (6.9%) with 6-7 & 10-11 – 1 year, 6 (4.6) with 12-13 years, 5 (0.5%) with 0-5 months, 4 (3.1%) with 14-15 years, 3 (2.3%) with 21-25 years, 2 (1.5%) with 16-18, 20-30 years and above 30 years and 1 (0.8%) with 16-18 years in service and 1 (0.8%) with no response.

How do the respondents assess the level of job motivation of the employees' evaluation of Quezon City Polytechnic University in terms of the following aspects:

- Extrinsic
- Intrinsic
- Performance Evaluation

In terms of extrinsic factor, for the assessment of the respondents on the level of motivation of the employees' evaluation of Quezon City Polytechnic University, the total grand weighted mean of 3.78 with verbal interpretation of Slightly Agree. Respondents gave the highest rating on Interpersonal Relationships with GWM of 4.10 interpreted Slightly Agree, while Technology got the lowest GWM of 3.29 interpreted Disagree.

In terms of intrinsic factor, for the assessment of the respondents on the level of motivation of the employees' evaluation of Quezon City Polytechnic University, the total grand weighted mean of 3.69 with verbal interpretation of Slightly Agree. Respondents gave the highest rating on work itself with GWM of 4.02 interpreted Slightly Agree, while Advancement got the lowest GWM of 3.50 interpreted Disagree.

In term of Performance Evaluation, for the assessment of the respondents on the level of motivation of the employees' evaluation of Quezon City Polytechnic University, the total grand weighted mean of 4.00 with verbal interpretation of Above Average. Respondents gave the highest rating on attitude and personality creativity with GWM of 4.10 interpreted Above Average, while Housekeeping and Safety got the lowest GWM of 3.80 interpreted Above Average.

Is there a significant difference in the respondents assessments on their level of motivation of the employees evaluation of Quezon City University in terms of their profile

In terms of Sex. Respondent assessed that dominated the not significant on their assessment in the Level of Job Motivation of the Employee Evaluation in Quezon City University. Therefore, hypothesis was accepted that there was no significant difference since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to sex. Extrinsic Factor on Recognition, Intrinsic factor on Technology and Performance Evaluation on Housekeeping are assessed and concluded that there was a significant difference according to respondents' perception.

In terms of Age of the respondents assessed the level of job motivation of the employees evaluation of Quezon City University that majority of the respondents are concluded and assessed that there was no significant since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to age, Extrinsic Factor on Responsibility and Intrinsic factor on Job are assessed and concluded that there was a significant difference according to respondents' when grouped according to age.

In terms of Civil Status of the respondents assessed the level of job motivation of the employees evaluation of Quezon City University that majority of the respondents are concluded and assessed that there was no significant since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to civil status. Extrinsic Factor on Advancement and Growth/Empowerment, Intrinsic factor on Technology and working condition are assessed and concluded that there was a significant difference according to respondents' when grouped according to civil status.

In terms of Highest Educational Attainment of the respondents assessed the level of job motivation of the employees evaluation of Quezon City University that majority of the respondents are concluded and assessed that there was no significant since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to civil status. Intrinsic factor on Technology is assessed and concluded that there was a significant difference according to respondents' when grouped according to highest educational attainment.

In terms of Job Position Level of the respondents assessed the level of job motivation of the employees evaluation of Quezon City University that respondents are concluded and assessed that there was no significant since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to job position level.

In terms of Number of Promotion in the Last three years of the respondents assessed the level of job motivation of the employees evaluation of Quezon City University that majority of the respondents are concluded and assessed that there was no significant since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to civil status.Intrinsic factor on Technology is assessed and concluded that there was a significant difference according to respondents' when grouped according to Number of Promotion in the Last three years.

In terms of Average Monthly Income of the respondents assessed the level of job motivation of the employees evaluation of Quezon City University that respondents are concluded and assessed that there was no significant since the p-value computed is greater than the assigned level of significant of 0.05 when grouped according to average monthly income.

Table 1. Summary Table of the Respondents of the study

Profile of Respondents		Frequency	Percentage
Sex	Male	53	40.8
	Female	63	48.5
	No response	14	10.8
Age	18 – 24 years old	19	14.6
	25 – 31 years old	18	13.8
	32 – 38 years old	43	33.1
	39 – 45 years old	43	33.1
	46 – 52 years old	5	3.8
	No Response	2	1.5
Civil Status	Single	57	43.8
	Married	69	53.1
	Legally Separated	1	0.8
	Widower	1	0.8
	No Response	2	1.5
Highest Educational Attainment	Doctorate Degree	4	3.1
	With Doctoral Units	11	8.5
	Master's Degree	71	54.6
	With Master's Units	36	27.7
	College Graduate	7	5.4
	College Undergraduate	0	0
	Vocational	0	0
	High School Graduate	0	0
	No response	1	0.8
Job Position Level	Rank and File	95	73.1
	Supervisor	19	14.6
	Top Management	0	0
	No Response	16	12.3

Average Number of Promotion in last three years	0 – 1 time	76	58.5
	2 – 3 times	9	6.9
	4 – 5 times	1	0.8
	6 – 7 times	0	0
	8 - 9 times	0	0
	More than 10 times	0	0
	No response	44	33.9
Length of Service	0 - 5 months	5	3.8
	6 months - 1 year	26	20.0
	2 - 3 years	28	21.5
	4 - 5 years	16	12.3
	6 - 7 years	9	6.9
	8 - 9 years	16	12.3
	10 - 11 years	9	6.9
	12 - 13 years	6	4.6
	14 - 15 years	4	3.1
	16 - 18 years	1	0.8
	19 - 20 years	2	1.5
	21 - 25 years	3	2.3
	25 - 30 years	2	1.5
	Above 30 years	2	1.5
	No response	1	.8

Table 2. Summary Level of Job Motivation of the Employees Evaluation of Quezon City University

Job Motivation	Weighted Mean	Verbal Interpretation
Intrinsic Factors	3.78	Agree
Extrinsic	3.69	Agree
Performance Evaluation	4.00	Good
Environmental Factors	4.12	Agree

Table 3. Summary of the Significant difference in the respondents' assessment on the level of job motivation of the Employees Evaluation of Quezon City University

Profile of Respondents	Factor	Decision	Remarks
Sex	Intrinsic	Accept Ho	Not Significant
	• Technology	Reject Ho	Significant
	Extrinsic	Accept Ho	Not Significant
	• Recognition	Reject Ho	Significant
	Performance Evaluation	Accept Ho	Not Significant
	• Housekeeping and safety	Reject Ho	Significant
Age	Intrinsic	Accept Ho	Not Significant
	• Job Satisfaction	Reject Ho	Significant
	Extrinsic	Accept Ho	Not Significant
	• Responsibility	Reject Ho	Significant
	Performance Evaluation	Accept Ho	Not Significant
Civil Status	Intrinsic	Accept Ho	Not Significant
	• Technology	Reject Ho	Significant
	• Working Condition	Reject Ho	Significant

	Extrinsic	Accept Ho	Not Significant
	• Advancement	Reject Ho	Significant
	• Growth / Empowerment	Reject Ho	Significant
	Performance Evaluation	Accept Ho	Not Significant
Highest Educational Attainment	Intrinsic	Accept Ho	Not Significant
	• Technology	Reject Ho	Significant
	Extrinsic	Accept Ho	Not Significant
	Performance Evaluation	Accept Ho	Not Significant
Job Position Level	Intrinsic	Accept Ho	Not Significant
	Extrinsic		
	Performance Evaluation		
Average Number of Promotion in the last three years	Intrinsic	Accept Ho	Not Significant
	• Technology	Reject Ho	Significant
	Extrinsic	Accept Ho	Not Significant
	Performance Evaluation	Accept Ho	Not Significant
	Intrinsic	Accept Ho	Not Significant
Length of Service	Extrinsic		
	Performance Evaluation		

Conclusion and Recommendations

Conclusions

- Regardless of the profile variables of the respondents in this study, the intrinsic and extrinsic rewards are important to satisfy and motivate employees to increase work performances and become productive.

- Employee attitude varies based on employee perception about support from organization, and employee's perception varies with the different type of motivational technique like intrinsic and extrinsic rewards.

- The factor of employees' job motivation is the presence of extrinsic and intrinsic motivation to improve their productivity, these two factors will also help the retention of employees in the organization is an essential for employee's job satisfaction. The Intrinsic and extrinsic rewards are essential for employee satisfaction, if employees are rewarded appropriately with salaries, bonuses and increment for their hard work then they will be motivated greatly towards achievement of their representative objectives and in the same way if employees are acknowledged properly against their efforts, then they will be more satisfied and happier towards their work

- Employees' motivation influences employee performance of the employees of Quezon City University. The results of correlation analysis in this study have demonstrated that motivation of employees have positive relationship with employee performance, which is statistically significant (p-value<0.05). This means that enhancing employee motivation positively improves employee performance. This leads to rejection of null hypothesis developed in this study, an indication that motivation of employees is a significant predictor of employee performance of the employees' evaluation of Quezon City University.

Recommendation

- Quezon City University should plan proper extrinsic and intrinsic rewards to their employees. Employees should be promoted when due in order to ensure better job performance. Management should make efforts to improve salaries, working conditions, job security, job dissatisfaction that will make employees feel happy about their job.

- Quezon City University should make positive effort towards improving and maintaining effective communication system between the three levels of management (top, middle, and low) and subordinates, so that workers will be acquitted of what is expected of them by the management. All employees should be motivated to ensure they are retained, and this will improve performance. Policies should be adapted which support team efforts inside the institutions. In this way, overall organizational productivity and effectiveness can be enhanced. It is important to develop such an atmosphere where employees are well satisfied with their jobs and cooperative with each other. With this, employees will be in position to utilize their full potential in their jobs. The research study strongly suggests that the teamwork activities must exist in the organizational environment and employees' performance can be enhanced.

- Employees should be given the opportunity to contribute their ideas to the affairs of the organization as this will boost their morale and consequently lead to higher productivity.

- Quezon City University must emphasize employee's satisfaction and commitment level. They should provide an atmosphere for the attainment of high productivity, which will in turn give employees a feeling of satisfaction.

- Conduct a similar study to different set of respondents to obtain result of the same study to give more emphasis of the current system of the institutions.

Acknowledgement

The researchers would like to thank first, God above for the knowledge and wisdom that was given to him. Glory to God! The researchers would like to thank co-researcher Dr. Federico B. Ramos for assistance in conducting literature searches and his dissertation entitled: "Level of Job Motivation in Tertiary Institutions in the National Capital Region" as basis of this research study. To the respondents, even if you have busy schedules, you have spared of your valuable time without which, this study not have all accomplished. May God bless you all.

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Into the Unknown: Teaching Experiences of CAPSU Teachers in the Era of Pandemic

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Abstract - COVID19 has disturbed and affected all sectors- education is no exception. Teachers are once again forced to enter a new dimension and perform different roles- as public health experts, tech support specialist, social workers, masters of distance learning and trauma-responsive educational practices. With these new responsibilities, it is imperative to understand what teaching is like that may lead in solving the hurdles it has brought to the higher education. This paper focused on the qualitative methods to describe the teaching experiences of Capiz State University teachers in the era of pandemic. Purposive sampling was employed in this study to gather eight teaching faculty. The participants were interviewed through video conferencing using a semi-structured questionnaire. To delve deeper with their experiences, Colaizzi's method was used to collect, record and analyze data. The researcher formulated five themes from the results as follows: Out of Comfort Zone, Module and E-learning, Work and Emotional Pressure, Ways of Coping and Academic Setbacks. The teaching faculty shared their experiences during this time of sudden change in the educational landscape and narrated how these made an impact in their lives and their career. The pandemic has reshaped the teaching style and delivery of the teachers, affected their mental and emotional health and even impacted student learning. Causes, inferences and recommendations based on these findings were discussed.

Keywords - COVID19, teaching experiences, teachers, descriptive phenomenology

Introduction

Teachers have been and will always be important agents in the educational system. They are regarded as key players of knowledge and commitment having direct contact with students and first hand experience of a roller coaster teaching-learning process.

Teaching is a multifaceted profession, involving unimaginable expectations and responsibilities. Year after year- generations after generations, countless times where teachers felt lost, insecure, uneasy and doubtful of themselves as they facilitators of learning and catalysts of change.

As the world advances, so is the educational landscape, challenging teachers in so many ways and at times leaving them hanging and unsupported. So much has happened, and yet they remain faithful and optimistic battling their way out as winners despite these obstacles.

However, another daunting event has conquered the world - coronavirus pandemic. This has disturbed and affected all sectors- education is no exception. Teachers are once again forced to enter a new dimension and perform different roles- as public health experts, tech support specialist, social workers, masters of distance learning and trauma-responsive educational practices. With these new responsibilities, how do teachers remain true in their commitment in delivering quality teaching in this era of pandemic?

COVID19 pandemic has brought a severe impact on higher education institutions as universities started to switch to remote learning and closed their premises in response to the enhanced community quarantine health protocols and measures.

Moreover, the crises has exposed the many inadequacies and inequities in our educational systems-from access to the broadband and computers needed for online education, and the supportive environments needed to focus on learning, up to the misalignment between resources and needs (OECD, 2020).

Having to enter a greatly different era, teachers have felt a little lost and unsure of how to deliver quality service and education since there is a need to transform their lessons into online versions in a short period of time.

Understanding what teaching is like during the pandemic is critical in solving the hurdles the coronavirus has brought to the public education. Moreover, there is a need to listen to teacher's experience in order to be enlightened and guided on the things needed to prepare for unprecedented events.

This research uses a descriptive phenomenology to answer the domain of inquiry that frame this study. The researcher would like to know the stories, experiences and challenges dealt by the faculty teaching in selected campuses of Capiz State University, a higher education institution.

Specifically, this study sought answers to the following questions:

1. What are the teaching struggles encountered by the CAPSU faculty in the era of pandemic?
2. How did the CAPSU faculty perceive the student experience?
3. How can the faculty describe their teaching experience in this era?
4. How do teacher cope during the pandemic school year?

Methodology

This study employed a descriptive phenomenology by Edmund Husserl. According to Husserl, it deals with concrete descriptions of experiences that participants themselves have lived through or experienced. descriptive phenomenology calls on the fundamental strategy of phenomenological reduction to "reduce" the world from how it is perceived naturally, that is where knowledge is held with judgement, to a world of pure phenomena (Dowling, 2007). Husserl believed that phenomenology suspended all suppositions, was related to consciousness, and was based on the meaning of the individual's experience (Reiners, 2012).

Descriptive phenomenology seeks to answers the research questions in a descriptive manner through interviews or observation of those closest to the phenomenon (Davison, 2013). Using purposive sampling, researchers will select individuals for study participation that are especially knowledgeable about or experienced with a phenomenon of interest (Cresswell & Plano Clark, 2011). This is an appropriate method to select the participants for a study using a descriptive phenomenological approach because the aim is to understand and describe a particular phenomenon from the perspective of those who have experienced it.

The participants from the selected campuses undergone a one-on-one in- depth interview through video conferencing and phone calls using a semi-structured questionnaire.
The transcribed interviews conducted by the researcher were the basis to substantiate the data that each conveyed with regards to the experiences encountered by the CAPSU teachers. Hence, there was a suspension of literature in this study.

Participants

The participants of this study were eight CAPSU teachers from the selected campuses. The participants were composed of four males and four females with age ranging from 25 to 64 years old. All of them are full-time faculty of Capiz State University and have pre-pandemic teaching experience as well as the online/module teaching experience. Also, one important factor in this study is the ability of the participants to share his/her experiences and willingness to impart his/her lived experiences as CAPSU faculty with pre-pandemic and pandemic teaching experience is not suffering from speech defects. Pseudonyms were used in discussing the participants' narratives to maintain confidentiality.

Table 1.

Participants	Description
Petunia (P1)	She is 56 years old, single, teaching in CAPSU for 32 years.
Severus (P2)	He is 40 years old, married, teaching in CAPSU for 10 years.
Remus (P3)	He is 51 years old, married, teaching in CAPSU for 9 years.
Hermione (P4)	She is 42 years old, married, teaching in CAPSU for 15 years.
Rita (P5)	He is 33 years old, married, teaching in CAPSU for 8 years.
Sirius (P6)	He is 30 years old, married, teaching in CAPSU for 3 years.
Dolores (P7)	She is 45 years old, married, teaching in CAPSU for 4 years.
Albus (P8)	He is 39 years old, single, teaching in CAPSU for 10 years.

Instrument

The researchers used a a semi structured questionnaire interview composed of two (2) parts, namely, Part I which asked as regards to their information. The second part included open-ended questions to be answered by the participants. The questions were in English and in the native dialect in order to ensure that participants were able to express their ideas and views well. Participants freely discussed their answers and the researchers provided in-depth questions to prompt further explanation from the participants.

Sampling and Data Gathering Procedure

The participants were chosen using purposive sampling. This type of sampling technique is subjective in nature that depends upon the judgment of the researcher regarding the subject to be studied (Creswell, 2013).

The researcher sought approval from the University President and Research Office to conduct the research. Then the Human Resource Office provided the researcher with information which helped in the selection of the participants. A letter of invitation was sent to the participants via messenger to get their involvement in the study. The interview was based on the convenient time of each participant.

The online interviews and phone calls that lasted from 45 minutes to an hour. The researcher initiated to set the mood and started a conversation with participants and asking permission to record the entire conversation. . It was then followed by a brief discussion about the research study and its objectives. The researcher provided follow up questions to help the participants freely share their stories and experiences about the given context. The researcher thanked the participants before ending the online interviews and phone calls.

During the conduct of the study, the researcher considered the ethical issues it may arise to the participants of the study. Thus, to protect the informants of the study, the researcher will gain the trust and confidence with them in order to instill the integrity of the research, guard against misconduct and any impropriety that can be reflected in their institutions, and cope with new challenging problems.

The researcher respected the informants' rights, needs, values and desires. The researcher carefully asked preliminary questions about personal issues before, during and after the interview .

Data Analysis

After the data were collected through a semi-structured interview guide (online interviews and phone calls), the rich in-depth narratives and responses to questions were transcribed verbatim and analyzed using Colaizzi's method of analysis.

The researcher attempted to understand the meanings embedded in the participants' statements to uncover common themes. The focus is on how each informant constructs meaning and knowledge through their lived experiences as a CAPSU teacher with pre-pandemic and pandemic teaching experiences.

The results of the study were shared with the eight participants, who confirmed the findings as their own original descriptions, to verify the statements and validate the information.
The researcher carefully considered her own perception and prior assumptions towards the concept of teaching in the era of pandemic.

Results and Discussions

The primary goal of this qualitative study was to explore the teaching experiences of Capiz State University teachers in the era of pandemic. This section presents the results that were obtained after the online interviews and phone calls with the participants.

The four emerging themes from the in-depth interviews include: 1) Out of Comfort Zone, 2) Module and E-learning, 3) Work and Emotional Pressure, 4) Ways of Coping, and 5) Academic Setbacks.

Out of Comfort Zone

Based on the responses of the participants, teaching in the pandemic era has brought them out of their comfort zones. They were introduced to a "new normal" lifestyle that has affected their routine most especially in facilitating the teaching-learning process. As reported by some of the participants, they were challenged in terms of their teaching strategies, learning assessment, grading performances, interaction with the students, and computer skills.

The pre-pandemic setup has been their way of life for so many years and they felt like something valuable had been snatched from them after the rise of the coronavirus. They were forced to adjust to several restrictions that led them to change their planned activities and reassess their skills and capabilities.

The findings of the study is consistent with the result in the article of Bhattacharya (2021), wherein COVID-19 has upended the world in more ways than one. It has pushed individuals out of their comfort zones and forced them to rethink the way they work, engage with customers, use technology, and deliver impact.

However, one of the participants said that the pandemic era is a breakthrough, a time to let go of the usual things and start becoming more creative and resourceful. Furthermore, he emphasized that this is a chance for teachers to break the culture of being in a box.

In the same article, Bhattacharya (2021) found out that, it [COVID 19] paved the way for people to reset and reinvent. It was a step out of my comfort zone, but it has also been a chance to be part of something great.

Module and E-learning

During the interview, the participants were able to share the type of distance learning employed by their campus. They narrated the survey conducted find out whether to employ modular learning or e-learning. It was found out that some participants use modular learning while others conduct online classes to facilitate the learning process.

There were four subthemes that emerged: 1) unstable connection, 2) preparedness in the making of modules 3) digital skill, and 4) limited activities.

The participants reported that most of their students preferred 'modular' than e-learning due to the poor internet connection in their area. Despite the fact that teachers may be able to find ways in supporting e-learning, it is of utmost important to heed to the call of their learners and resort to the use of modules. However, the participants further said that they are having difficulty in the preparation of modules due to time constraint. The limited time they have to make modules impacted the quality of the activities and content included in the module. Moreover, another obstacle in the process are the resources and printing of modules. On the other hand, participants using e-learning described how their exposure different online platforms helped improve their digital skills and become more effective users of the online applications. However, they have observed that not all the students were able to join their online class due to weak internet connection. Also, they pointed out the limited number of activities available for the students during this era.

The result of the study agrees with the findings of Said (2021), that millions of learners were affected by educational institution closures due to the pandemic, which resulted in the largest online movement in the history of education.

Furthermore, in Amir et., al (2020), they found out that majority agreed blended learning that combined classroom and distance learning can be implemented hence forth and this pandemic changes not only the utilization of technology in education but the pedagogy strategies in the future.

Also, in the study of Reimers, he stated that school systems and governments will attempt to establish alternative modalities of education during the period of necessary social distancing, but those will most likely work well for children whose parents have more education, who have other social advantages, and who have access to resources, including online connectivity and devices, so they can continue to enjoy structured opportunities to learn. For many children lacking those conditions, the period of physical distancing is likely to result in very limited opportunities to learn.

Work and Emotional Pressure

The participants expressed their struggles and how troubled they felt while performing their duties. They describe how difficult it is to live up to the expectations of everybody and how to remain strong not knowing the danger it might cause. They asserted that COVID19 pandemic did not stop the other additional assignments and school and deadlines they should beat. They narrated how COVID19 brought them fear, emptiness, uncertainty, guilt and anxiety. They wholeheartedly shared how they fear not just for their lives but for their family members every time they went home from school, unsure if they have exposed themselves to carriers of the virus. They worry each time a colleague would test positive and the 14-day quarantine will follow. Moreover, they tend to lose focus and eventually felt lost. These potential emotional responses to stress vary extensively. These include distress, apprehension, delight, humiliation, rage, despair, and even denial. Emotional responses can be relatively persevering, encouraging reflection over a taxing event that may hold onto physiological stress responses elevated (Glynn, Christenfeld, & Gerin, 2002 as cited in MontaÑo and Gidaya, 2020).

According to Sokal, Trudel and Babb (2020). Over the first three months of the pandemic, teachers demonstrated increasing exhaustion and cynicism but also increased efficacy for classroom management and increased sense of accomplishment. In addition, teachers' cognitive and emotional attitudes toward change became more negative.

Ways of Coping

Despite their struggles, the participants were able to point out various ways of coping in this time of great adjustment. From this theme, four subthemes emerged; 1) positive outlook, 2) teamwork 3) prayer, and 4) self-love.

Having a positive outlook in life allowed the participants to overcome uncertainties especially when confronting COVID19 virus. Looking at the brighter side of things have helped them adjust with the pressure and distress. The participants believed that the situation taught them to better themselves and they were able to acquire surviving skills which will aid them in the future. The feeling of not being alone had also contributed to build great camaraderie. In this tough times, they have colleagues and mentors whom they can rely on. Furthermore, the support from the administration by providing them resources and allowing them to update themselves with the trends through webinars and workshops. The situation had also strengthened their relationship with the Supreme Being. They recognized the importance of faith and hope in this time of darkness. Furthermore, they narrated how they were able to appreciate themselves more, they learned how to be with nature, self-reflect, give themselves time to rest and enjoy living in the moment.

In Andrade, Bosano and Paz (2021), they found out that the teachers' most used coping strategies included seeking social support, exercising, and engaging in leisure activities.

Maclntyre, Gregersen and Mercer (2020) cited that the rapid conversion to online teaching, the blurred lines between work and home coupled with the omnipresent concern for the health of family and oneself, has produced high levels of stress. Teachers are coping as best they can using a variety of techniques. In terms of psychological health and well-being, coping techniques that can be considered more active and approach-oriented, ones that more tackle the issues created by the situation including the emotions aroused, are associated with more positive outcomes.

Academic Setbacks

The participants reported that they were unsure of the student's progress and learning in the pandemic era. They feel guilty of the quality of learning and services they offer to their students though they are quite sure they are giving more than their best to facilitate the learning process. Sometimes, they question themselves of their efficiency and effectivity as teacher. They wonder if their students were really taking the time to read their modules, absorb lesson during online classes and were they really able to transfer the knowledge that would help students develop skills and critical thinking that will help them in the future. It saddened them to see their students graduate without meeting them for real and knowing that they deserve more that when this pandemic era can offer.

In the report of the Department of Education (2021), it was highlighted that despite the heroic efforts by teachers, staff, and school leaders— many of whom quickly developed online lessons, remote-teaching plans, and concrete strategies for meeting students' basic needs— challenges were profound.

In the United States, researchers have documented the effects of 'summer learning loss' demonstrating that extended interruption of one's studies causes not only a suspension of learning time, but causes a loss of knowledge and skills gained (Reimers & Schleicher, 2020).

Furthermore, Reimers (2020) pointed out that for the vast majority of children who lose opportunities to learn because of the pandemic, it will be hard to recover from those losses, the harder the longer the period of physical isolation from other students and teachers. The educational disadvantage such losses generate will beget more educational, and eventually economic and social disadvantage. Because these losses will be experienced by large segments of the population, societies will suffer as their productivity is diminished.

Conclusion and Recommendations

The results of the study revealed that as to age majority of the participants were 40 years old and above. Most of them have been in the teaching profession for more than 10 years. There were eight participants, with four males and four females from selected campuses who were involved in the study,

Based on the responses, five themes emerged: 1) Out of Comfort Zone, 2) Module and E-learning, 3) Work and Emotional Pressure, 4) Ways of Coping, and 5) Academic Setbacks.

The results revealed that Capiz State University teachers were forced to adopt a 'new normal' lifestyle due to COVID19 pandemic. Several adjustments were made to cater the needs of the learners. Though teaching in the pandemic era is challenging and full of uncertainties, initiatives and attempts were made by administration, faculty and staff to address pressing concerns and continue to support the education sector. The rise of distance learning has created a serious impact on both the lives of the teachers and students, due to several factors campuses decided to employ the best type of distance ;earning suited for their learners.

The pandemic brought additional burden on teachers especially on their work and emotional being. The feeling fear and uncertainty has bothered them more than ever not just for themselves but for the danger they might cause to the members of their family. However, they remain resilient and look for ways cope with the recent situation.

It was also found out that teachers worry about the limited opportunities they can offer for the students. Undeniably, there is lacking in the development of skills and critical thinking of the students.

Conclusion

Teaching profession has evolved over time. With the recent events, teacher expectations have reached its highest peak. Thus, it is vitally important to understand the situation and changes to avoid more complications.

The study concludes that CAPSU teachers are greatly affected and challenged by COVID19 most especially in their delivery of the teaching-learning process. There are several factors that hinder them to provide quality education and services to the students however heroic attempts were made just to make sure that the students were able to learn despite restrictions and limited number of opportunities in this new normal set up. Moreover, teacher remain hopeful and remain resilient amidst uncertainty.

Recommendations

The administration may show support by providing resources needed to facilitate the learning process. Moreover, the university may organize enjoyable and nurturing activities to alleviate not only their physical and mental health but their emotional health as well. They may also practice empathy and learn to respect an individual's way of coping.

Acknowledgment

I am indebted of the support and assistance extended by Capiz State University, Research Development Office, CAPSU Burias family, Merry, my family and husband.

To you God, I offer this success.

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Duality of Workers' Predicaments: A Deconstructive Analysis of John Manalili's Poems

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Abstract - Literature as a mirror of life has always presented the manifold complexities of human nature both in the transparent and opaque scribbling of letters. Some literature present realities in a more direct manner that is easily comprehensible to an ordinary reader. So much so, there are some literature that need to be scrutinized by using extraordinary lenses in order to extract the concealed panoramic realities that are not readily available to literary patrons. With all these in mind, the researchers aimed to unfold the binary oppositions situated on the three poems in John Manalili's book "Sandirit" namely "Mangabiayan, Camatayan", "Nune't lalù ring aliuâ", and "Kakaluguran." The researchers utilized Jacques Derrida's Deconstruction as the primary literary construct in the analyses. The binary oppositions that were found to be evident in the three poems were the juxtaposing concept of life and death. Commonly, life is regarded to be good, pleasant, amusing, vital, dynamic and hopeful while death is bad, unpleasant, and sorrowful. On the contrary, the study deconstructively viewed life as undesirable while death was seen through a lens which depicts salvation. The text revealed that life provided nothing but misery whereas death offered relief and solace. The study offers a new perspective on matters concerning life and death. More so, this literary research exposes the brilliance and ingenuity of Kapampangan poets which can be observed through the analyses of Dr. John Manalili's works. The researchers strongly recommend further scrutiny of classical and contemporary Kapampangan literary masterpieces in order to unearth the untouched and hidden treasures of Kapampangan letters.

Keywords - Binary Opposition; Deconstruction; Death; Life; Literature

Introduction

Literature represents social life. It is in the quality of the literature by which the life it reflects is definitely and intimately connected. It also reflects life which presupposes a social background. Correspondingly, literature is a social phenomenon in which it is used as a language, a medium as well as a social creation in order to create a clear manifestation of a man's life.

Further definition that supports the power of literature in representing social life is provided by Ahmed (2017) who stated that literature and society reflect on each other. Through life, an individual can craft pieces of literature and it is in literature that reflects the life and patterns of society. In line with this idea, it is a window for the people to see the real world and reflect upon their own lives. Moreover, literature across the world depicts how people live and offers perspectives upon the lives of others; hence, providing anecdotes capturing the underlying truths common to all people like the hardship of working to live will elevate the fact that literature and society are indeed intertwined.

Literature is a reflection of culture and tradition. It mirrors life through every word that directly manifests the social life of everyone, especially the ordinary people. In fact, in José Corazón De Jesús' "Manggagawa," social life in literature is heavily perceived throughout the poem; it is all about a blacksmith who does work with dedication and hard work regardless of the dangers and predicaments of the nature of the job.

The blacksmith is being hired not only to make objects from iron and steel, but also in construction sites as a workforce, making hammocks for the children and even in a cemetery to create crosses for the dead. In the poem, one can see how versatile and enthusiastic the blacksmith is in order to make money and deal with different people to provide for the family in spite of the plight that the blacksmith faces in every work. Thus, José Corazon De Jesus really showed readers Filipino workers selflessness, sacrificial love, and resiliency.

Literature is multifaceted that even a tiny detail of a man or small thing can be written up and considered literature. That is the beauty of literature — it is universal, it is language, and it is accessible. Meanwhile, it can also be referred to as the product of man's manifold experiences with his expressions and feelings. With that being said, it can be the story of man. Man's love, grief, thoughts, dreams and aspirations coached in beautiful language are literature.

With the above-mentioned literary works, literature is indeed an imitation of life. The correlation between literature and real life is undeniably high. Life gives the means by which literature develops in an artistic form. The subject matter of literature is the presentation of life. Life provides raw material in which literature interfaces with artistic pleasure, pattern as well as form. Moreover, the way of a writer's novel and unique experiences of life is through literature. This only shows the intimate and vital connection between life and literature is indeed inseparable.

Looking into the different forms of literature, it can be categorized into different types: oral and written. Oral literature is the standard form of literature found in societies without writing. The word oral literature may also be defined as the kind of literature that is transmitted by word of mouth. In simpler terms, these are literature that do not use writing to be read by the readers. On the other hand, written literature is the form of human expression through writing. Unlike oral literature, this form began with the invention of writing.

In addition, literature can also be categorized into three main genres: prose, drama and poetry. Prose uses language that is plain and straightforward; it has no formal metrical structure. It applies a natural flow of speech and ordinary grammatical structure, rather than rhythmic structure. On the one hand, Drama is a mode of fictional representation through dialogue and performance. On the other hand, Poetry is a genre of literature that evokes a concentrated imaginative awareness of experience or a specific emotional response through language chosen and arranged for its meaning, sound, and rhythm. For many years, poetry has become an instrument of many people to convey emotion, message, and meaning.

Villafuerte (2000) attributed poetry to life but in a simple word which flows in the human body. Literature has its own existence because it also has its own throbbing as well as hot blood flowing into the veins and arteries of every creature and society. In order to convey and extract meaningful experiences, poetry should rely on sensuous and rich imagery and by this, the conveyed experiences have the power to evoke in us the genuine feeling and depth which is often philosophical in thought.

In a local setting or context, poetry is also one of the pivotal genres of Philippine Literature for it has been enveloped in several platforms with the objective of featuring the life, culture, and tradition of a particular region.

As a matter of fact, it has been cited in the blogspot of Rotor (2015) titled "Living with Nature", in which Crisostomo emphasized that it is with understanding and appreciating first, our very own literature in which we are able to understand and appreciate the uniqueness of others. Therefore, every Filipino needs to revisit and appreciate Philippine Literature regardless of professions and status.

One good example of Philippine Literature is the Kapampangan Literature. Kapampangan Literature is rich in history. As Garcia (2017) stated, Spain's colonial power had inevitably subjugated the literary sight of the early Pampango writings from the folk songs, folk verses, poetry, religious texts, zarzuela, plays, and novels. Moreover, Spanish invaders wanted to advance their imperialistic cause, pressed on the folk and blended naturally with the Kapampangan sensibility.

Kapampangan literature has paved its way to advance in a more urgent aspect that corresponds to the progressing movement of the province as well as its literary history. The literature of Kapampangan continues to prosper and enliven the artistic and creative minds of Kapampangan poets and writers.

One of the well-known Kapampangan poets is John S. Manalili who has produced many literary works. Manalili was a prolific and established literary artist. Manalili was a poet laureate who worked on many projects to promote and exhibit the beauty of Kapampangan language and literature. Manalili was crowned as poet laureate by the Prince of Parnassus, Romeo Rodriguez, in front of Juan Crisostomo Caballa Soto's monument (father of Kapampangan Literature) in Bacolor, Pampanga. Manalili was also a Radio Executive, Radio Host, Chief of the Public Affairs Division Bureau of Broadcast Services-Philippine Broadcasting Service, station manager of Radyo ng Bayan738 khz and NBN4 TV host. Moreover, Manalili was the News Editor of AM and FM Stations of Manila Broadcasting, Cebu Editor of the Republic News in Cebu City, Editor of Radio Veritas as well as Producer-Announcer of the former Voice of the Philippines.

Axiomatically, there are variables in the title of this research which play a vital and critical role in explaining and exhibiting the very essence of the study. These are the words: Duality and Predicament. According to Merriam Webster Dictionary, duality means the quality or state of having two different elements and an instance of opposition between two concepts or aspects of something while the word predicaments means a difficult, perplexing, or trying situation.

In a nutshell, the role of literature in a man's life is indeed valuable. It enriches and immerses the human mind into the different perspectives and knowledge of the world. Significantly, literature enables people to bring into view the different facets of life.

From all the presented studies about literature, it gives essences to how writers and poets illuminate the social life and status of people. This definition of literature is indeed a pivotal one for it manifests in the main theme of the three poems (about status and conditions of workers) utilized by the researchers. Moreover, poetry serves as a medium for people to express and narrate anecdotes and a way to enlighten others of what is really happening. Through this, a certain drive inside was awakened which resulted in creating an avenue to study its impact on both society and certain individuals.

The researchers aimed to unfold the hidden messages inside of the poem and to uncover binary opposition situated on the three poems in John Manalili's book "Sandirit" namely "Mangabiayan, Camatayan" (Life, Death) , "Nune't lalù ring aliuâ" (More than the others) , and "Kakaluguran" (Friend).

Methodology

The researchers aimed to unfold the hidden messages inside of the poem and to uncover binary opposition situated on the three poems in John Manalili's book "Sandirit" namely "Mangabiayan, Camatayan" (Life, Death) , "Nune't lalù ring aliuâ" (More than the others) , and "Kakaluguran" (Friend) .

To achieve the objectives of this study, the researchers utilized Jacques Derrida's Deconstruction Approach. According to Hendricks (2016), Deconstruction is a theory of language and literature that started in 1970 which Jacques Derrida asserts that there was 'nothing outside the text'. Derrida further stated that "deconstruction is a useful means of saying new things about the text." It is not simply to reverse the text but to seek for meaning brought by binary opposition in order to uncover the hidden messages.

Analyses

Being impoverished in contemporary society is not ideal. Having a minimal salary that is inadequate to gratify basic needs and other necessities might lead to even more critical consequences, including death. The chain of poverty has stretched a long way but only few people have the opportunity to break it. That is why, people are really betting their all on their chosen job and livelihood hoping that this will help them to have a better life. These realities are seen not only in a pair of eyes but also through great literature which gives a broader understanding of society.

In congruence with this, three poems have been scrutinized using deconstructive analysis and by using death and life as binary opposition. These literary works were written by John S. Manalili, one of the best Kapampangan poets and writers who produced numerous literary works. He gave birth to the collection of poems titled "Sandirit " in the year 2012. Manalili's Nune't lalù ring aliuâ, Kakaluguran, and Mangabiayan, Camatayan will be utilized in the study as the main subjects for the analysis.

Nune't lalù ring aliuâ (More than the others)

This poem depicts the adversities and sentiments of the workers. A number of phrases and stanzas encapsulate the plight of the workers: farmers as food suppliers, carpenters as homebuilders, fishermen as fish and aquatic vendors, and Overseas Filipino Workers as opportunity seekers are all featured in the text. Paradoxically, these individuals are struggling to the extent where farmers are running out of food, carpenters are unable to construct their own permanent homes, fishermen are finding it tricky to venture out into the seas and ponds, and OFWs are being compelled to find employment in foreign countries to give their families a good and comfortable life.

The poem Nune't lalù ring aliuâ captures how dedicated and devoted workers are towards their duties. The surface meaning of the poem highlights that they made a significant and valuable contribution to society despite the hardships, struggles and constraints that they experienced. Hence, their lives also became valuable and pleasing for others. However, the gradually dying state of the workers in order to supply life displays a negative notion. Thus, this investigation into the poem's opposition will undoubtedly bring to the emergence of a binary, life and death.

In the opening verse, the farmers are left with the dilemma of heavy manual labor and excruciating back ache. This is written in the following lines: "itámu ring durúlucan ning aldo at pámaspasán na ning ángin at urán, mángasayúcut lalù ing baluctút nang gulugúd." (it is us who are burnt by the heat of the sun and buffeted by winds and heavy rain, his curved spine writhes,)

It highlights the long-standing perils of those who rely solely on agriculture as their primary source of revenue which is inadequate. As a result, they are pressured to take out loans in order to sustain their livelihood. They have, however, dwelt in perpetual irony, as these individuals who supply food for many, are unable to afford their own. This is evident in the following lines: "bang micápéra a cúlang pa king panialî king áusan dang canán at pamáyad king aláng capúpúsang útang." (to earn barely enough to buy the thing they called food, and payment for the never-ending debt.)

Corollary to the aforementioned, Petrola & Ledesma (2018) emphasized that farmers are the country's main food providers, yet they have faced illnesses as a consequence of dense and heavy manual labor because they are working continuously. Despite their tireless efforts, their salaries as family providers do not equate and justify the sacrifices they have made and the hardships that they experienced.

Carpenters, on the contrary, who devote their labor and expertise to build other people's homes, dealt with the similar irony as farmers. People who have never had a house are known to be home constructors. "pácasamásan ding gagáuang balé samántálang alâ tang saríling tucnángan." (besting in building the house, while we don't have our own house.)

The Ministry of Labour (2008) stated that construction workers are classified as members of the unorganized sector wherein these workers of this particular sector face an increased seasonality of employment, a lack of a former employer-employee relationship, and a lack of social security protection.

Sadly, the Ministry of Labour (2008) reveals that these laborers live in their own homes or in huts or residences given by their employers. Regardless of the fact that they are one of the persons behind a lavish and attractive structure, the majority of them do not have their own shelter or they do not have the means to construct their own homes.

Meanwhile, some of the phrases in the second verse alluded to an evident stumbling block that many fishermen encounter. They relentlessly go out to seas and ponds, fulfilling their fishing duty. Yet, they face unpredictability and hazard in their situation — aside from ensnaring fishes, they might also lose their lives if they are not cautious enough. "Itámu ring talábanté plaisdán aldó´t béngi bulán-bulán cábang mágpaniamán ya menilà itang mamuísan; itámu ring durúlung king dáyat málat, mibábatáng dácap asán, lisiâ-lisiâ, mimíngat póta icatámung uláman da ring asán." (we, the caretakers of fisheries day and night, monthly, while the owner is living luxuriously in Manila; we are also venturing the sea, enduring to catch fish, changing places , careful because we might be the food of the fish.)

Fishing, often known as marine fishery, is one of the most dangerous vocations in the world. Numerous commercial fishing activities are defined by harmful work situations, difficult labor, extensive work hours and adverse weather (Chen et al., 2020). Working in this field might reveal the truth of most low-wage employment that are backed and subsidized by financial institutions. They undoubtedly put in minimal effort, yet they make far more money than those who battle the depths of peril.

The heroic sacrifices of persons travelling to other countries, on the other hand, were also highlighted. They grasp the chance and choose to gamble in the hopes of bettering their individual families' situations. "...dinayù at ménaliuáng lugál/bang ápasantíng dítac mu man ing bié da ring licuán a lulúgurán a e ta man ácául o ácamuánan uling atmo rayû."(… traveled from other place to make the life better, even just a little, of those loved ones we left we couldn't hug or scold because they are distant,)

One of the stories written by Michael Coroza entitled "Mga Kahon ni Kálon", exemplifies the saddest and more arduous aspects of working experience. Many workers lay down their lives by travelling to other areas, given the threat of having cruel bosses, exploitative contracts, and non-regularization; tragedies and accidents outside or on board a ship; or diseases and illnesses: all to meet and support their families' economic necessities, and to give them a better life (Bansig & Marco, 2015). This amplifies the notion pertaining to predicaments of the workers or overseas workers in search of the opportunity that will elevate the status of their lives.

All of the above-mentioned workers' lives have been enmeshed in daunting and deeply-rooted situations that have left them feeling lost and unappreciated. This lends to the idea that life is fraught with difficulties, unwelcomed circumstances. This shows that 'life' is a horrible thought for workers.

In reality, a worker's life is notable for its detrimental impacts, which can be physiological, psychological, emotional, financial, and even social. Workers now have a difficulty in that striving for work demands has a series of adverse repercussions on their work-life balance, such as increased pressure, job fatigue, and disruptions of work and at home relationships. (Meenakshi et al., 2013).

The proof of workers' dilemmas and assigned responsibilities demonstrates how difficult it is for them to shoulder the load of keeping society functional. As a result, the poem's conclusion emphasizes how death has come to be regarded as a favored term, while life has come to be regarded as a less favored term. It provides the impression that they are ostensibly or gradually dying as a result of sorrow and tragedy. This ruled in the following lines: "...itámu ring mágpacámaté bang cumabié." (...we are the ones who die to live.)

Furthermore, the only way out of these hardships and situations is to die. In this study, the so-called death will be perceived as an exile for the workers to alleviate and soothe their agony and anguish. Van Beek et al. (2015) claims that people in terrible life situations and who are gravely ill embrace and perhaps even consider death as an escape, or that death suddenly seems more enticing to them than to live.

Similarly, as cited in UKEssay (2018), for Hamlet death is but a tranquil escape from the misery and problems of life. He views life as a time to "suffer the slings and arrows of outrageous fortune" where opposing the troubles does not make their end certain. However, with death, they are no more. The titular character views death as serene and it serves to free from the unbearable challenges of life. Thus, Hamlet's view on death supports the notion that it is with death in which workers can actually deviate from the cruelty of life — life full of hardships, challenges and predicaments.

In terms of binary opposition, the assertion of the aforementioned statements referring to the adverse effects of numerous workers' hurdles and experiences articulates the premise of life being unfavorable to these workers, despite the certitude that workers perish to provide the needs and lives of others. Hence, the claim that life is a desirable thought for workers is supported by the idea that these workers die just to provide life; and that their death is also regarded as a liberation from their immense miseries.

Kakaluguran (Friend)

Kakaluguran is the 106th poem in Manalili's book "Sandirit" and is one of the many works that vividly captures the life and seem to be anecdotes of many workers. Carpenters, fishermen, maids, farmers, sewers, entertainers, teachers, and lawyers were mentioned as to the roles they have This labour poem mentioned different faces of labor and jobs, mainly those sectors of the society who are struggling in severe poverty. One of the most arduous challenges faced by workers is navigating life with all of its intricacies and hardship in quest of a better situation. Poverty is what drives workers to fall into a downward trajectory. Laborers pursue status elevation for a variety of reasons, including scarcity of resources and job insecurity. This is represented in one of Manalili's poems entitled "Kakaluguran."

As an analysis, the poem accentuates that it is with the aspiration of the workers which is to have a better life, in which they are forced to do such arduous work or labor. The workers are said to work in building bridges, highways as well as houses of those people who have the capacity to erect their own homes. This is manifested in the lines, "Mamamagobra kareng gagawan dang tete at dalan O karing bayung bale da reng atinan." (working on the bridges and roads they built, or in the new homes of affluent.)

This shows how one of the friends of the persona in the poem did his way of escalating the status of life and that is through working as a construction worker.

The construction sector is confronted with a number of hazardous health issues. It has a far greater risk of work-related injuries, as well as a very high frequency of both acute and chronic musculoskeletal pain. Low back discomfort, back injuries, and significant mental distress are the most commonly reported complaints among construction workers. (Jacobsen et al., 2013) This could only signify that these construction workers are exhausting and depleting their physical bodies in order to make money.

Another job or work that has been mentioned in the poem are the friends of the person who became maid and others became joy and pleasure givers through prostitution. The maids were forced to work with their employer, and prostitutes were selling their bodies knowing that these kinds of jobs will help them achieve their desire - to have a better life. This is manifested in the line, Ating meki-ipus, ating mamisaling tula at saya." (Some are slaves, some are selling joy and fun.)

As stated in the preceding paragraph, not only maids face difficulties, but also women who rely on their bodies to live and earn money, they called it prostitution, According to Lebni et al., (2020) prostitution has been a part of society since ancient times, and it is still prevalent now in practically every country, where it is tolerated in certain regions but condemned in others. The majority of prostitutes cite their own sexuality, sexual curiosity, and money as the primary motivations for choosing their means of living.

Being a farmer and a food provider have also been mentioned in the poem. The persona stated that among all of his friends, others became farmers. These people choose to become farmers in order to have and to provide food. This is ruled in the line, "Ating tinanam pale at ginawang pamangan," (Some planted rice and made food,)

Farmers are recognized as essential workers thus, despite their crucial role in ensuring food security, agricultural workers remain among the poorest group of people in the society. Due to the social conditions faced by agricultural workers, they desire to free themselves in the misfortunes of life. However, their rough journey towards the attainment of these desires made them suffer in pain and despair (Petrola & Ladesma, 2018). The strong hopes to earn but at the same time producing enough food for their families has no guarantee to be achieved because of the perplexing situation they are in.

Sewers or tailors were also reflected in the poem. The persona raised these kinds of jobs as his friends chose to pursue this kind of work in order to get something to eat. This is strengthened in the line, "Ating menayi at aliwang pagobran, Ba lang ating kanan." (Some sewed and other labor ,To have something to eat,)

Tailors are known to be under tremendous job strain. Despite the fact that they were subjected to a high level of tedious work and stitching, had optical and pulmonary difficulties, they are willing to endure these conditions in order to earn a living (Dwivedi & Kiran, 2015). Facing the same situation as the previously mentioned worker, blood and sweat is the capital investment in doing different occupations to aid their basic necessity. This supports the aforesaid statement that workers whose job are tailors are indeed working ceaselessly, day and night, with such commitment to their work. Thus, it is evident that they're straining real hard to feed themselves and their families.

Lastly, the poem revealed that there were friends of the person who have been pointing at the sinners and committing lies in order for them to garner compensation and have something to eat. Upon scrutinizing, the persona does not directly mention the kind of work, but it depicts the work of a lawyer. This is strengthened in the lines, "Ating memanuru, at memamaglaram Ba lang manakitan." (Someone taught and lied in order to earn.)

In connection to the abovementioned, Galanter (2016) reinforced that lawyers nowadays have a terrible reputation. They are portrayed as money-hungry criminals willing to go to any length, even sacrificing their own integrity and ethics, in order to "win the case" (Galanter in Davis: 2016, p.1). This literature strengthens the stand that these lawyers use their authority and knowledge to exploit the less privileged, especially the poor, and to persuade people to lie for their own gain.

Implicitly, the narratives of the persona speak so strongly about the predicaments of workers. For as long as they live and try to answer their search for a better life, their suffering is prolonged and long been endured; hence, the concept of death is viewed as a better destiny for them which contradicts the common interpretation of being the negative endpoint of someone's journey.

Death as the other binary in the poem implicitly expresses a situation where an individual would not need anything to find peace. "Anggia mang tutu ping ding Taung miragsa na ala nong balu," (Though it seems true that the people who have fallen has no consciousness)

These lines assert how the concept of death was strongly associated with the inability to remember and feel anything that only in death they could forget everything including all the perplexities in life.

In the study entitled, "Death in Literature" asserted that humans really do not have solid evidence about death as an experience; death is totally characterized as a secret and mysterious event. Thus, humans can encounter death the way they witness the death of others (Caroll, 2019). To elaborate the depth of interpretation of how death gradually causes the human senses to stop functioning, an article by Dear (2016) titled "What it Feels Like to Die" makes a clear explanation about the nature of death. "First hunger and then thirst are lost. Speech is lost next, followed by vision. The last senses to go are usually hearing and touch." Whether dying is physically painful, or how painful it is, appears to vary". The absence or loss of senses is what the persona is trying to denote about the lines which solidify the understanding that death will result in not feeling anything including all life's adversities.

Mangabiayan, Camatayan (Life, Death)

Mangabiayan, Camatayan is a two-stanza poem which talks about the struggles of the workers and how they are facing the daily hardships of doing something for a living. Established on the surface meaning of the poem, this third poem of Manalili viewed life as a purposeful one as the breadwinner seeks for a solution in providing the necessities of the family member in spite of the struggles. Hence, death became disadvantageous on the part of the family members since the breadwinner's fate is to die and they will have no means to supply their basic needs. Contrary to this, the study views the concept of life in a lens that shows life as an unpleasant situation for the breadwinner or worker and death as good fate to flee from their predicaments.

With the desire to garner a better living, this is what pushes them to bear the consequences. Life as the other opposition emphasizes that as long as these workers continue to conquer the bitter taste of labour, their obstacles will continue. This can be reflected in the following lines: "Eda pansin ding magobra ing karelan panucyatan maglampas man caring bunduk o nung nanung cararasan nung mipildis la mung bagya mabaldug la at casiran" (The workers do not notice how far they have climbed to cross the mountains or whatever they encounter, if they got lost on the way even just a little they will fall and be broken;)

In congruence with the aforesaid, tackling in a great number of ways wherein work and health-related concerns are linked to each individual and society. Aside from the incentives that can be acquired such as material and status rewards from working and having paid in a certain occupation, it also makes them exposed to wider consequences (unforeseeable danger) affecting and influencing their overall health. (Burgard & Lin, 2013). Relatively, many employees work with the purpose of providing for their families which is a very selfless and unconditional act but most often, these works lead them to awful consequences.

To cater the necessities of their family is the fundamental reason why they sacrifice. As an excerpt from the poem, the statement can be manifested in the lines, “pilan dalan mung mamesus ing sucat dang panakitan bang panyaling nasi’t ulam da ring sapning luluguran” (a hundred peso is what they earn, to buy rice and food for their family)

Life is now being portrayed as a situation that gradually accentuated the fact that the very source of workers’ income is slowly becoming the source of their great suffering.

As a matter of fact, finding and staying in a job where having a low salary is an unavoidable circumstance. (Schnabel, 2021). Due to this, the concept of sacrifice set off to be a dominant theme in the socio-economic setting of common low-wage laborers. Self-sacrifice is seen as a high virtue with regard to the commitment and service they rendered for the family. (Bahr & Bahr, 2001). Providers in the family, usually in the context of Filipino families, have been very significant, especially on the side of the poor family. The fruit of their labor is equivalent to the consumption and daily needs of the entire family.

In opposition, the death can be seen in the poem as a way for the workers to deviate from the predicaments of life in providing a good life and basic necessities for the family even reaching the point of sacrificing and risking the life in exchange of a single peso. Moreover, with the predicaments experienced by the workers, the poem later reveals that their fate is to die. This can also be viewed as a compelling proof that death can unchain the hardships intertwined with life. This is ruled in the lines “ding magobrang mangabiayan, ing palad da camatayan.” (those workers earning a living, their fate is to die.)

The poems explicitly believe the notion that death connotes a negative meaning, thus death through the study, has yielded an interpretation that the cycle of poverty continues to exist especially to the poor ones and brought to conclude that death is the other path to exit from the indestructible fate of suffering.

Corollary to the aforementioned, Pipes (1991) emphasized that death solves all the problems and believed that if there is no man, there will be no problem. This elicits that with the predicaments experienced by the workers, death is viewed in an advantageous optic in which their death is also the death of their predicaments; thus, if there is no man, no one will experience challenges and there will be no problems.

As the juxtaposition between life and death of workers implies, the laborers' fate of dying redirects them to be in a good situation which is difficult to realize as death was heavily perceived as negative, based on the tone of the persona. Workers’ sacrificial love as they live is something positive because it satisfies the basic needs of their families but death as an accorded fate frees them to end their sufferings. Unnoticeably, the analysis offers a potential meaning that is not intended by the author and the close reading of it produces means of looking at the text. Although death may appear to be a frightening prospect, the laborer’s death was not in vain because they were able to provide life for their loved ones.

In a nutshell, John Manalili’s labor poems: Nune’t lalu reng aliua, Kakaluguran, and Mangabiayan, Camatayan display the binary opposition of life and death. The concept of three poems presupposes that death supplies a meaning that is negative in which a common reading would have to agree. Thus, it contradicts itself the way they view life as a tragic experience. The concept of death and life has been reversed: life is positive and death is negative. Thus, the researchers have found out that it is life that becomes unpleasant and death as a salvation in the end. Life is not always a paradise to live for especially to those individuals who are not given the luxury to enjoy it in all its joy and comfort. It must be life which will provide them the means to strive for, not the way that laborers' lives were reflected in the poems. From this view, when life fails to accord the peace, comfort and serenity, death can grant a door to escape from the sufferings.

Conclusion and Recommendations

Life becomes miserable as we fight for family, as we provide for the necessity and as we work for the benefits of community. The poems clearly showed that workers or breadwinners have a significant contribution towards their families and communities because these people supply and sustain other's life, however, this has made them suffer a lot because of their jobs, works and roles. There were a lot of instances in the poem where workers suffered hardships because of their desire to provide for the family as well as to work in the community. Workers became food providers, house builders, entertainers and the like.

Meanwhile, there were also instances that workers were not able to endure the sufferings because of their work; hence, they reached the endpoint of life. Death has given a new connotation of being the exit, salvation, and escape towards a place of peace. Therefore, it is significant to say that the other half of the binary opposition (death) undoubtedly gives a euphemistic meaning as a pattern of life. More so, it concurs with Shakespeare's character “Hamlet” where death is not the end of life but a tranquil situation to anyone. Death is like a serene state in which it enables a worker to get out of the deep-seeded predicaments from the unbearable challenges of life.

Even the life in paradise of the workers is not aesthetically beautiful and amusing as what they want and death serves as a relief and salvation for them in order to achieve a higher form of pleasurable peace. This premise then contends that life is not as comfortable and convenient to everybody. Some people are facing hardships just by simply living. This kind of experience propels them to think that death is better and will end the suffering. The study offers a new perspective on how life and death will be perceived.

Indeed, it is recommended that workers should not be seen as an object which will be subjected to different predicaments as workers comply with their roles in the community and family. In fact, any people in the community and family have the ability to provide for themselves and live on their own. Workers should not be enveloped in the quagmire of poverty or worst be enveloped in the notion that death is the only way to solve problems, if workers have the desire and capability to accentuate the status of their living. With that, literature impels us to delve deeper and not be satisfied only with what is obvious and visible with our naked eyes; instead, we should immerse ourselves towards the heart of literature in order to activate its ability to drive our souls to greater knowledge. Thus, these poems served as a tangible testament to how life and death can be reversed and how it can widen the horizon of human perception. The researchers suggest that in order to perpetuate the perennial essence and ingenuity of Kapampangan Literature like John Manalili's poems, the literary works can be explored through different literary approaches.

Acknowledgement

First and foremost, praises and thanks to God the Almighty for giving us strength, knowledge, and guidance to complete this research work.

Likewise, we would like to express our warmest gratitude and appreciation to all the following individuals who had supported us all throughout the making of our thesis entitled, “Duality of Workers' Predicaments: A Deconstructive Analysis of John Manalili's Poems.”

To our thesis adviser, Dr. Mark Joseph B. Layug, and thesis professor, Dr. Mildred M. Crisostomo, for their undying support, guidance, and supervision of this research paper.

Moreover, our humble gratitude to our esteemed research panelists, Dr. Mildred M. Crisostomo, Mrs. Joyce Ann M. Tolentino and Dr. Joyce Arrozal, for helping us to sort out the problems in our paper through crucial feedback and suggestions for the improvements; making this research possible.

Finally, to all our families, friends, and our BSEd English 4-B family A.Y. 2018-2022 who continually encourage, trust, and root for us from the beginning up until the end.

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The Democratic Paradox of Duterte: Mapping the cognitive-affective ideological structure of leftist student organizations in Manila and Davao

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Abstract - The ongoing war on drugs in the Philippines has become the epicenter of discourse and concern regarding human rights, populism, and illiberal democracy. While most studies focus on President Duterte's controversial 'strongman' persona and mass appeal, very few have sought to analyze the locals' attitudes towards him as cognitive-affective phenomena. To address this gap, this paper provides an in-depth qualitative analysis of pre-selected subjects in Davao and Manila, two regions in the Philippines with arguably the most salient pro-and anti-Duterte populations, respectively, in 2019. Using a mapping software modeled after Paul Thagard's emotional coherence theory, this study maps the possible cognitive-affective processes underpinning the political ideologies of an influential leftist organization in the Philippines. Cognitive dissonance theory was used to consolidate the qualitative analyses of data derived from the surveys and interviews. The findings suggest that the two populations' political ideologies were relatively similar, as expected of subjects who belong to the same organization. However, the significant differences in the subjects' stances towards the Duterte administration suggest that the socio-political contexts of Manila and Davao could affect political opinions and views despite their similar core political ideologies.

Keywords - Cognitive dissonance theory; Emotional coherence theory; Cognitive-affective mapping; Illiberal democracy; Philippine political ideologies

Introduction

For decades, the tenets of liberalism were considered implicit in the Western democratic framework. In his sensational Foreign Affairs article, Fareed Zakaria (1997) criticized this as a flawed assumption since liberalism and democracy have always been theoretically and historically distinct concepts. This critique became increasingly relevant as illiberalism became a divisive concept among political groups in Western democracies. Chantal Mouffe (2000) later coined the term democratic paradox, explaining how the Western concept of 'liberal democracy' is tethered to ideologies that were never even linked philosophically:

"On one side we have the liberal tradition constituted by the rule of law, the defence of human rights and the respect of individual liberty; on the other the democratic tradition whose main ideas are those of equality, identity between governing and governed and popular sovereignty. There is no necessary relation between those two distinct traditions but only a contingent historical articulation." (p. 2)

Recent discourse on illiberalism revolves around the rise of strongman politicians around the world whose inclination for populist rhetoric and democratic-but-illiberal stratagem exhibit this paradox. Among the heads of state given this "strongman" label was Philippine President Rodrigo Duterte who became the new populist bogeyman of the Global South because of his administration's war on drugs policy (Ordoñez & Borja, 2018). While most studies focus on Duterte's controversial persona and mass appeal, few have sought to analyze locals' attitudes towards him and his administration as cognitive-affective phenomena; whereas, recent populist movements in Europe are being thoroughly explored from various ideological lenses and political cognition theories in Western academia (Gerodimos, 2015; Freeden, 2017; Stavrakakis et al., 2017). In this vein, there is a need for new studies that deliberately contextualize current Philippine politics to the broader concepts of liberal democracy, as described in the democratic paradox theory. As such, a more nuanced understanding is needed on what constitutes 'populism' according to the Filipinos who condemn the Duterte administration on the same grounds as Western critiques of illiberalism.

To address this gap, one ought to first evaluate the pertinence of 'illiberalism' to the Philippine context whose political contours are shaped by socio-cultural and historical factors different from those in most Western liberal democracies. The following case study ties recent developments in Philippine politics to these theoretical frameworks by comparing two student chapters - one based in Manila, the other in Davao - of an influential leftist organization in the Philippines. Building on Paul Thagard's (2015) emotional coherence theory, the political ideologies of each chapter were mapped and simulated as cognitive-affective processes to compare and contrast the two groups. Cognitive dissonance theory was then employed to consolidate and interpret the data derived from the surveys and interviews. The next section provides a brief overview of the regional contexts of Manila and Davao where the local stances towards illiberalism are contingent on the respective legacies of previous political movements and regimes. The third section provides an overview of the theoretical frameworks employed in assessing the cognitive-affective processes underlying an individual's political value system.

Background

Davao and Manila are two metropoles that arguably shaped Philippine politics with their respective histories in supporting and opposing strongman leadership. Metro Manila's opposition to dictatorship traces back to civil and political resistance against former President Marcos's Martial Law between 1965 and 1986. The civilian-led People Power Revolution of Manila is a pivotal protest in modern Philippine history credited for overthrowing the Marcos regime and reviving democratic institutions. After Marcos, seats of power rotated among the same few liberal oligarchs and socioeconomic inequalities remained entrenched (Benedict, 1988), causing support for procedural democracy to wane (Quimpo, 2008). In the struggle for a "more participatory and egalitarian democracy" (p. 295), a large number of cause-oriented groups were founded in Metro Manila to lobby the interests of dissatisfied leftists (Kimura, 2003). This new left emerged from growing low- and middle-class frustrations towards the democratic gridlock perpetuated by traditional politicians or "trapos" in Manila who took over after Marcos (Quimpo, 2008). However, the left's ideological ambiguity, inability to reach a critical mass of the population, and struggle to establish a solid caucus with significant electoral power impeded its efforts to overtake the Manila oligarchs (Bello, 2016; Quimpo, 2008).

During the 2016 elections, Duterte's populist rhetoric appealed to the majority of low- and middle-income Manila voters whose frustrations towards trapos became increasingly palpable (Heydarian, 2017). He responded to democracy fatigue by promising quick fixes and heavy-handed solutions to national issues (Mendoza, 2018). His campaign leveraged the national distrust towards trapos, relying on demagogic language and the "patriotic trolling" tactics of his zealous supporters, dominating the electoral discourse on social media (Curato, 2016; Etter, 2017). Duterte emerged victorious in the capital region despite joining the race months later than his opponents, spending the least on his campaign, and lacking an established political party to back him (Cook & Salazar, 2016). As president-elect, he still received heavy criticism from major universities and new left organizations in Manila who condemned his illiberal methods and dictatorial tendencies (Timberman, 2019). Interestingly, the Visayan and Mindanaoan chapters of these leftist universities and organizations did not always share their Manila counterparts' stances. Duterte's candidacy aggravated these long-standing regional tensions, especially between "Imperial Manila" and the Southern Philippine regions.

Before his presidential candidacy, Duterte cultivated his strongman reputation as the former mayor of Davao, the most populated region in the South (Teehankee, 2017). Once a "hotbed for crime and communist insurgency" (p. 53), Davao became globally recognized under his leadership for its zero crime rates, setting it apart from other Philippine cities. Throughout his twenty-two-year tenure as mayor, the vigilante group Davao Death Squad (DDS) was primarily linked to the extrajudicial killings of civilians purportedly involved in the drug network (Breuil and Rozema, 2009). In 2017, Duterte belatedly acknowledged the squad's existence a year into his presidency, finally confirming public speculations that DDS was responsible for reducing drug-related crime in Davao (Santos & de Guzman, 2017). This zero-tolerance approach later became the template for the Duterte administration's Philippine Drug War policy.

Akin to most modern populists, Duterte is capable of transcending ideological barriers, being a self-described socialist and having worked closely with leftist organizations as Davao mayor. He appeased local communist groups during his mayorship and early in his presidency, even forging peace accords in an attempt to end one of the longest-running insurgencies in world history (Casiño, 2017; Heydarian, 2016; Santos, 2016). His unprecedented victory opened up a new political space for anti-trapo candidates whose tactics can appeal to a wide spectrum of ideologies (Cook & Salazar, 2016; Aguirre, 2018). Moreover, his regime saw the culmination of regional tensions, leveraging the tendency of Filipinos to lean on their geographical loyalties and the lack of coherent ideologies and political parties strong enough to mobilize critical masses at the national level (Bauzon, 1991; Cook & Salazar, 2016; Timberman, 2019).

Manila and Davao arguably exhibit the most salient regional features in terms of the left's fragmentation under Duterte. Opposition towards Duterte grew stronger among leftist organizations in Manila who criticized his illiberal methods since his candidacy, most notably his death squad tactics as mayor, which he later enforced for his anti-drug operations in the Manila slums as president. Meanwhile, many of their leftist counterparts in Davao endorsed Duterte's candidacy, believing that his appointment could finally advance their interests after a century of political exclusion due to a failing democracy (Maboloc, 2017). Building on their respective political contexts, this paper argues that the different priorities and impetuses of the Manila leftists and their Davao counterparts not only attest to political regionalism in the Philippines, but also the fundamental crisis of liberal democracies, as Mouffe described. A closer investigation at intra-organizational similarities and differences of the political left in these two regions can help contextualize Philippines under Duterte within the democratic paradox.

Theoretical Framework

Thagard (2015) argues that people do not "rationalize" their political stances based on careful calculations of utility and logical reasoning, as most rational choice theories would posit. Rather, he argues that people "rationalize" by assessing how emotionally coherent a stance is with their personal beliefs and goals which, in practice, generates less-than-rational inferences about the issue at hand. Hence, people tend to gravitate towards views that validate their strongly-held ideologies and belief systems consisting of interrelated concepts with emotional values attached to them. Although this does not explain how people acquire, retain, or abandon their core beliefs, it could be argued that emotional coherence is the dominant mental mechanism guiding such processes.

Modeled after Thagard's theory, cognitive-affective maps (CAM) illustrate belief systems and ideological processes by depicting not only the relationships between concepts but also the emotions associated with them. The diagram below summarizes the basic components of a CAM generated using the version of EMPATHICA created by the Ideological Conflict Project:

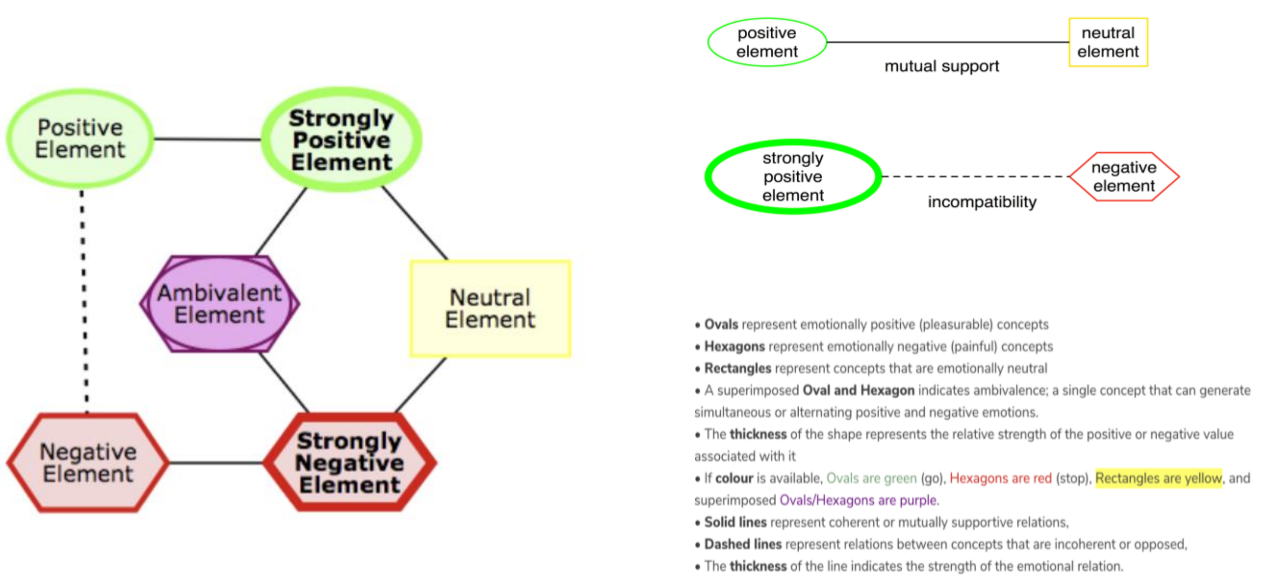


Figure 1. Basic properties of a cognitive affective map

CAM incorporates the vital aspects of emotional coherence by depicting ideology as a neural network of concepts in which "the activation of one concept leads to the activation of another according to a characteristic pattern" (Mock, 2018, p. 373) with the goal of "maximizing the satisfaction of multiple cognitive and emotional constraints" (van Rooij et al., 2007, p. 4). Approaching ideology as a complex system of interconnected concepts is not new to political psychology research. In 1992, Spellman and Holyoak (1992) used a similar computational method to understand how ideologies shifted during the Persian Gulf war and found that attitudes towards the war were directly shaped by adjusting one's cognitive network of interconnected concepts such as their stances towards the United States and political figures like Saddam Hussein as well as their ambiguous ideals of pacifism and isolationism. This interdisciplinary framework became widely used by more recent studies on conceptual change, a cognitive process one exhibits when changing political perceptions which, from the ideological lens, can help explain shifts in voting patterns and affiliations.

However, conceptual change happens only when an individual's belief system undergoes heavy restructuring, which rarely occurs without a major shift in external circumstances and an iterative process of generating new beliefs, revising old ones, and internally justifying why these changes were necessary. Cognitive dissonance theory (CDT) suggests that individuals have an "inner drive to hold all [their] attitudes and beliefs in harmony and avoid disharmony (or dissonance)" (McLeod, 2014, para. 3). That is, when people are faced with information inconsistent with their deeply-held beliefs (schema), they rarely exhibit conceptual change immediately after encountering dissonance. Instead, people often rely on cognitive strategies to resolve the dissonance between their belief system and the new information that threatens it (Spillane et al., 2016; Critcher et al., 2009).

While emotional coherence provides a viable mechanism as to why people gravitate towards certain beliefs, CDT attempts to explain how people cope with information opposing these core ideologies. When coping with dissonance, people exhibit cognitive biases, most notably selection bias and confirmation bias, or psychological resolve, in which one resorts to treating two issues as separate and irrelevant to one another despite being deeply related.

Methodology

Sampling Population

For confidentiality purposes, the pseudonym "Pilipina" will be used to refer to the organization used as the sampling population. Pilipina is a prominent leftist women's organization with active regional chapters in Manila and Davao. To further minimize confounding factors, only members enrolled at the Manila and Davao campuses of the same university system were sampled to keep demographic factors constant. Pilipina's values-driven advocacy coincides with several tenets of liberalism and equality underpinning democracy described by Mouffe. Apart from advocating for women's rights, the organization actively endorses human rights, rule of law, and civil freedoms and condemns inequality, corruption, and elitism. While Pilipina is not politically-motivated, it has publicly expressed dissent against initiatives spearheaded by the Duterte administration. As an organization, it condemns the president's misogynist comments and rape jokes and equally criticizes left-leaning politicians and oligarchs perpetuating socioeconomic inequalities. Despite the agreement on these particular issues, the organization's rationale towards Duterte was remarkably fragmented during the 2016 elections when some members from its Mindanao chapters expressed their support for him as president-elect. These dynamics make Pilipina an ideal sampling population to explore the internal fragmentation of leftist ideologies in environments where populism is a serious threat to liberal democracy.

Preliminary Survey and Interviews

The subjects were individually asked to complete a preliminary survey organized into three main parts to measure the following:

Part 1: Familiarity with and stances on two major policies (Drug War and TRAIN Law)

Part 2: Attitudes towards tenets of democracy on the concepts of liberalism and equality as described by Mouffe

Part 3: Perceptions towards the current administration, President Duterte's previous mayorship, perceptions of the president's controversial statements.

Both the survey and interview were designed to measure five dimensions: stances on major national policies; support for major political blocs; perceptions of liberal democracy; perceptions of President Duterte; perceptions of Duterte's leftist supporters. The three parts of the survey were organized to minimize overall priming. Most of the survey questions prompt the participant to self-report their agreement towards a particular statement. For these items, a 7-point Likert scale was used, which has been found to be the most optimal scale in collecting reliable survey data from written questionnaires (Krosnick & Pressner, 2009). The only items in which the 7-point scale did not apply are questions gauging the subject's self-reported familiarity with a concept or issue, for which the baseline is zero (i.e. "0: Not Familiar", "1: Quite Familiar", "2: Familiar", "3: Very Familiar") and optional open-ended questions asking the subject to expound on their survey responses or any other text-based responses.

At least three participants were randomly selected from each chapter for 30 to 40-minute phone interviews. Each interview consisted of 10 to 14 questions tailored according to each subject's survey responses, depending on their degree of support or dissent towards democratic ideals, the president himself, and major party blocs, among others. The questions were designed as prompts for the subject to provide further justification regarding their stances and attitudes towards the issues and to clarify or resolve their self-contradicting responses. All interviewed subjects were asked the same opening and closing questions, the latter referring specifically to the Pilipina regional chapters' internal disagreement over Duterte's presidential candidacy. The interviews were conducted during the first quarter of 2019. The closing questions are as follows:

1. In 2016, the Pilipina southern chapter campaigned for President Duterte. Personally, how did you feel about the endorsement?

2. In 2018, the Pilipina southern chapter took back this endorsement, saying "they were wrong" about the president, two years into his term. Why do you think the chapter revoked its support?

After collecting the preliminary data from the participants, CAMs were generated on the Manila and Davao chapters' responses for each part of the survey to compute the corresponding "emotional coherence" of each map using the EMPATHICA software. Afterwards, potential points of cognitive dissonance were assessed during the interviews to observe the coping mechanisms participants would exhibit to justify their stances or process information incoherent to their views.

Discussion of Results

In total, twenty-six survey responses out of ~60 members from Manila and nineteen survey responses out of ~20 members from Davao were collected. The table below summarizes the median, interquartile range, and calculated p-value from the Mann-Whitney U-Test of the responses from Manila and Davao for each item. Upon graphing the histograms of responses for each survey item and observing a recurrent skewness in the results, the Likert-scale items were analyzed as interval data.

Table 1. Summary of Mann-Whitney U-Test p-values

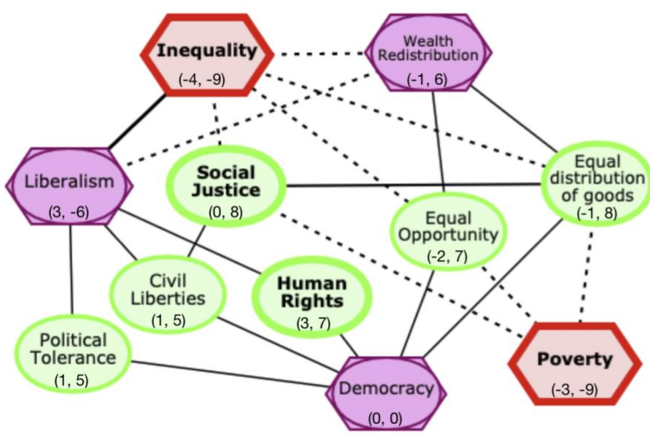
Question	Manila		Davao		Significance (p-value)
	Median	IQR	Median	IQR	
Part 1: Democratic Paradox (Liberalism and Equality)	*Do you agree with these statements? (7-point scale)*				
Democracy is the most ideal system of government.	4	2.75	5	1.5	0.58232

Core Concepts on Liberalism					
The government has the duty to uphold the human rights and welfare of each and every individual, no matter what.	7	1	7	0	0.18684
Being part of a democracy entails being respectful of opposing views.	5	2	5	2.5	0.75656
The core essence of democracy is to protect liberal freedoms, e.g. right to speech, life, personal safety, and fair trial.	5	1.75	6	1	**0.0477 ****
Composite Score (3 items above)	5.67	1.58	6	1.167	0.16758
[Conditional] Individual liberal freedoms should always be prioritized even when huge inequalities of wealth and privilege exist.	2.5	1.75	3	2	0.71884
Core Concepts on Equality					
Access to primary goods is a better measure of social justice than access to liberal freedoms.	5	2	4.5	1	0.56868
Equality of opportunity is the key goal of democracy.	5.5	1	5	1	0.83366
Equal distribution of primary goods should be the main priority of the government.	6	1.75	6	1	0.6818
Composite Score (3 items above)	5.33	1.33	5.33	0.833	0.57548
[Conditional] In societies with huge inequalities, the government has to promote measures of wealth redistribution even though they can hurt society temporarily. (e.g. using tax revenue from price hikes on basic commodities to fund public education).	5	3	5	2.5	0.79486
Part 2: Stances towards Duterte and his administration					
Familiarity with and stances on policies					
Drug War Familiarity (4-point scale) (1- No knowledge, 2 - Not very familiar, 3 - Quite familiar, 4 - Very familiar)	3.5	1	4	1	0.60306
Drug War Stance (7-point scale) (-3: Strongly Disagree, -2: Somewhat Disagree, -1: Disagree, 0: Neutral, 1: Agree, 2: Somewhat Agree, 3: Strongly Agree)	1	0	1	1	**0.09102 ***
TRAIN Familiarity (4-point scale)	3	1	3	1	0.9124
TRAIN Stance (7-point scale)	1	1	1	0	0.53526
Do you agree with these statements? (7-point scale)					
President Duterte's mayorship in Davao should be judged separately from his work as president.	5	4	5	3	0.29834
President Duterte's mayorship in Davao is an effective template to use in solving nationwide issues.	1	1	3	1	**0.00104 *****
The president's controversial statements are blown out of proportion by the media.	2	1.75	3	2.5	**0.0139 ****
Supporting, not opposing, the current administration would be beneficial for Philippine society.	1	0	2	1	0.16758

The president’s controversial statements inflict real damage on Philippine society.	7	0	6	1	**0.03486** **
Damages that may result from the drug war is a justifiable means if it results in ending the drug-related problems society has faced for decades.	1	0	2	1	0.12356
The president’s political and economic policies matter more than his statements.	2	2.75	3	2	0.42952
Nitpicking the president’s controversial remarks distracts the public from the real issues.	5	4	6	3.5	0.24604
Rate your stance on the following statements (7-point scale)					
The president’s controversial remarks should not be taken too seriously.	1	0	1	0.5	0.3125
The strong reactions against the president’s rape joke are mostly due to cultural differences.	1	0	1	1	0.1902
The president should be judged for his long history of pro-women policymaking, not his remarks.	1	1	2	0	**0.0466** **
The international media distorts the president’s statements against women and interprets them out of context.	1	1	2	2	**0.0784** *

Democratic Paradox: Tenets of liberalism and equality

Both groups associated inequality and poverty as very negative concepts and human rights as a very positive one. Despite a few negligible differences (e.g. Davao has a slightly more positive attitude towards civil liberties), the following diagrams confirm speculations that the two chapters exhibit very similar ideologies, being members of the same political organization.



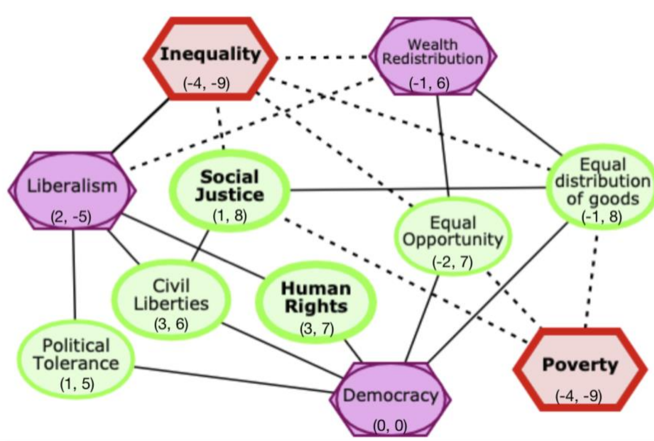


Figure 2a. Manila chapter: Core Ideology **Figure 2b. Davao chapter: Core Ideology**

As expected, inequality was considered a very negative concept by both chapters. Social justice was associated with equal distribution of goods and the eradication of poverty and inequality. The concept of liberalism was perceived by both groups as a rather ambiguous concept, generating either positive or negative opinions, depending on the stimulus. On one hand, human rights, civil liberties, and political tolerance were considered positive concepts. When all three were active, both groups tended to perceive liberalism positively as well. On the other hand, both groups also associated inequality with liberalism. For instance, when inequalities perpetuated by the liberal elite were discussed, their confidence in liberalism as a 'positive' concept also diminished. Hence, both chapters tend to prioritize equality over liberalism in theory, assuming that these diagrams indeed represent the subjects' basal political ideologies since they were not prompted with triggers to activate these nodes.

Political Opinions: Stances towards the Duterte administration

In terms of stances towards the presidential administration, both Manila and Davao exhibited strongly negative reactions towards Duterte's national expertise, national policies, presidency, controversial remarks, international image, and rape jokes. Both also have strongly positive reactions towards media coverage and women's rights. However, there were three crucial differences between the two chapters' perceptions of Duterte.

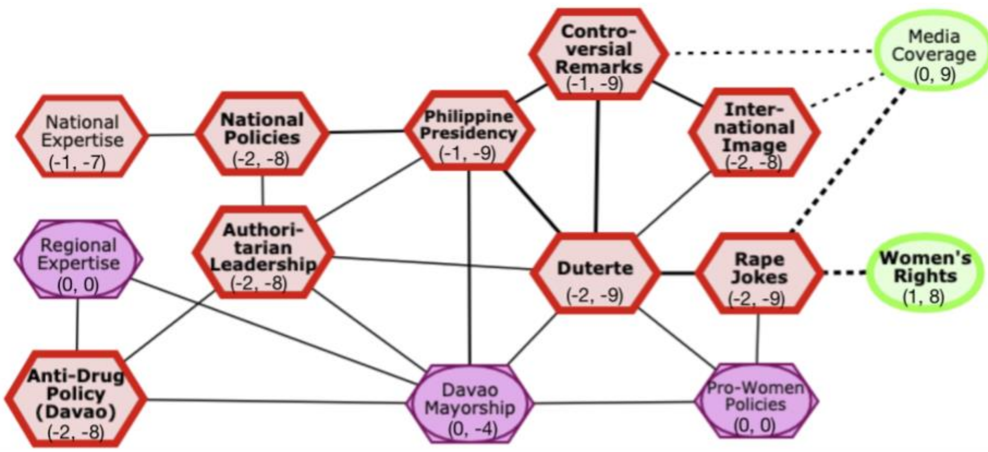


Figure 3a. Manila chapter: Stances towards Duterte and his administration

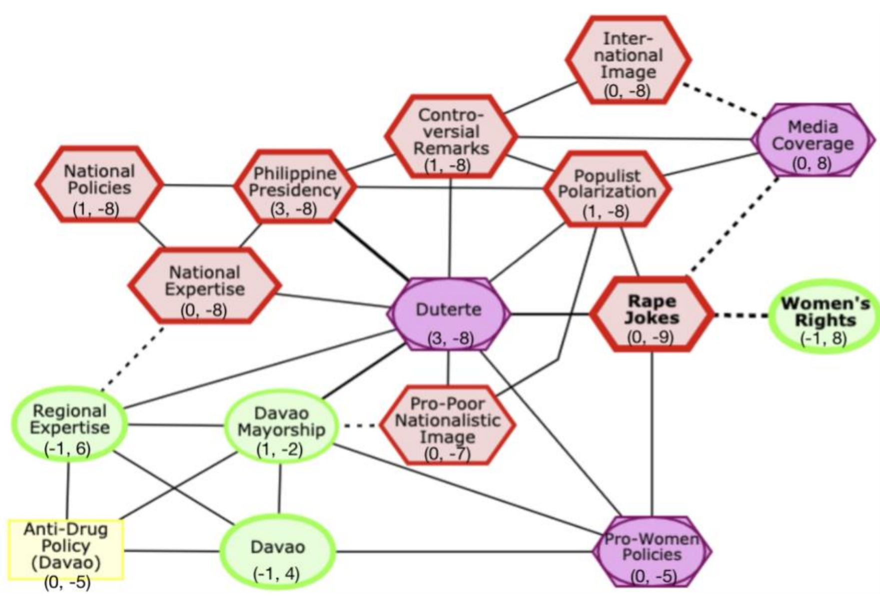


Figure 3b. Davao chapter: Stances towards Duterte and his administration

First, the Davao group perceived his regional expertise as a positive trait, emphasizing the former mayor's deep knowledge of southern Philippine politics and adept negotiation skills to keep the peace in Davao. Manila members were rather neutral on the issue since they are not as familiar with Duterte's regional expertise of the south. More importantly, the Manila group based its negative conceptualization of Duterte on other very negative factors related to his presidency. Despite their lack of knowledge of Duterte's mayorship, the Manila group perceived it negatively, associating it with his authoritarian style of leadership as a president. Meanwhile, Davao was more conflicted towards Duterte himself and finds the concept rather ambiguous. On one hand, they associate him with positive concepts towards Davao where Duterte served as mayor for decades and used his regional expertise to advance the region's interests. On the other hand, they also associate Duterte with his presidency which the Davao chapter condemns, similar to their Manila counterparts.

During the interviews, the Davao members cited populist polarization and Duterte's pro-masses nationalistic image as two of the worst things about his presidency. They saw his attempts to appear as pro-poor as inauthentic, finding it incoherent with their perception of him as the former Davao mayor who came from a family of rather powerful oligarchs. However, the Davao group criticized his role as president due to his lack of national expertise in alleviating conditions for the Philippine masses, but not his authoritarian style of leadership, as their counterparts from Manila did. Those from Manila associated both his anti-drug policy in Davao and his national-level policies as president with his authoritarian leadership which they viewed as the overarching problem with Duterte politics. Although Davao also processed his national policies negatively, they were less opposed to Duterte's anti-drug policy as mayor, given their more positive perceptions of his regional expertise and mayorship in Davao.

Prompt: Justifying stances towards Duterte using organization's core political ideologies

When the interviewees were asked to justify their stances towards Duterte in relation to their organization's ideology, key differences emerged between the two chapters. Most of these also stem from their different perceptions of Davao, the president himself, and his mayorship, regional expertise, and authoritarian style of leadership, as discussed earlier.

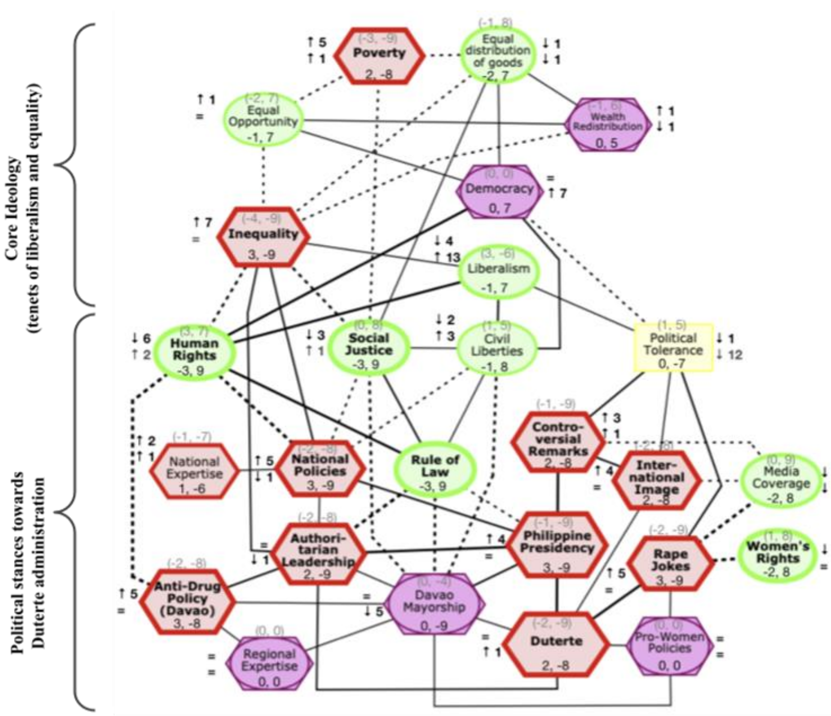


Figure 4a. Manila chapter: Prompted to justify stances towards Duterte using core ideology

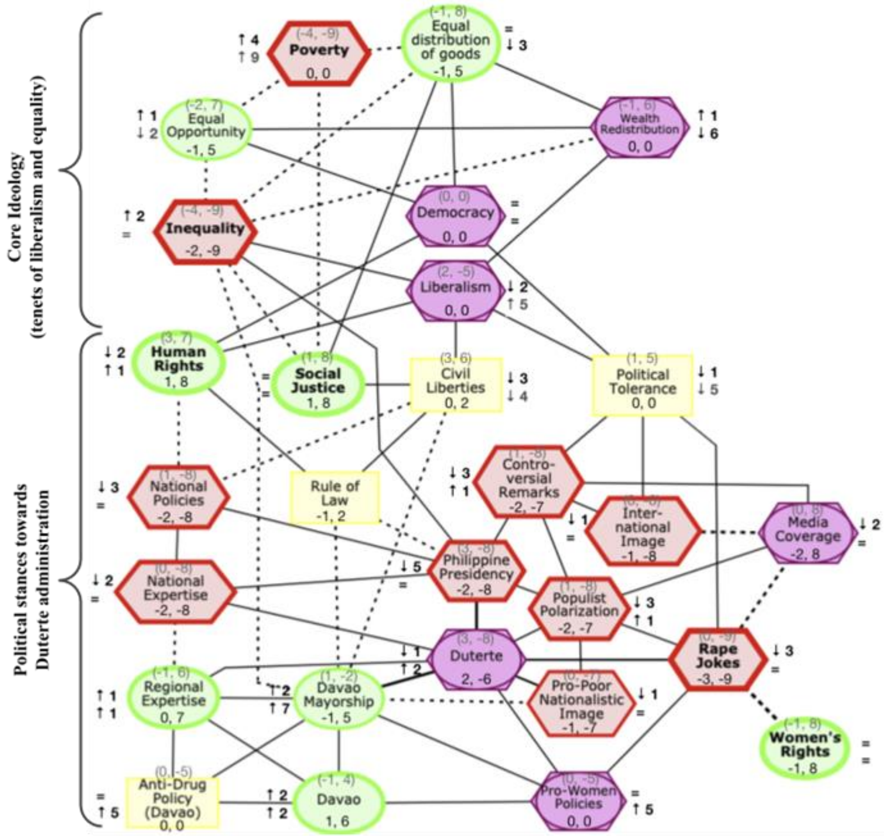


Figure 4b. Davao chapter: Prompted to justify stances towards Duterte using core ideology

Overall, there was no remarkable activation of the concepts on liberalism or equality among Davao participants when asked to relate their stances towards Duterte with their organization's core principles. Inequality, social justice, and human rights remained very active but poverty and wealth redistribution became inactive, lacking relevance to the Davao group's response to the prompt.

Meanwhile, the Manila interviewees emphasized civil liberties, rule of law, and human rights in justifying their stances. This promptly activated democracy and liberalism, two previously neutral concepts. The Manila interviewees perceived Duterte's anti-drug policy as Davao mayor, his national policies as president, and overall authoritarian leadership as incoherent with these three liberal concepts. Positive perceptions of liberalism among the Davao interviewees also increased when justifying their stances towards the president. Similar to their Manila counterparts, they emphasized the need for human rights in response to the president's national policies. But unlike the Manila group, the Davao group perceived fewer concepts as incoherent with human rights, civil liberties, and rule of law to really activate liberalism or democracy. Thus, democracy and liberalism remained neutral among the interviewees from the Davao chapter while the two were positively activated among those in the Manila chapter.

Political tolerance also became a negative concept for both chapters, linking it to the president's rape jokes, controversial remarks, and international image as a strongman politician. Both groups believed that these public messages inflict real damage to society. However, the Manila participants further emphasized the need to regulate the president's controversial remarks, rape jokes, and public image because they go against the liberal aspects of democracy. Whereas, the Davao participants did not refer to any liberal concepts in their justification.

Another key difference is the direct association between democracy and civil liberties. From a purely ideological perspective, both Manila and Davao perceived civil liberties as coherent with the concept of democracy (see Figures 2a and 2b). In response to the prompt, Manila retained the connection between democracy and civil liberties. Whereas, Davao severed the connection because of the cognitive dissonance it would create, given their positive activation of Davao despite acknowledging that civil liberties (i.e. due process, protection from extrajudicial killings) were violated under his mayorship. To cope with the possible dissonance, emphasis on civil liberties was reduced.

Both groups also mentioned the importance of rule of law in protecting human rights and civil liberties in the context of Duterte's presidency. However, there was a key difference in how the two groups processed rule of law as a concept. On one hand, Manila interviewees associated it as a positive concept linked to social justice as well as antithetical to authoritarian leadership — both as mayor and president. Whereas, the interviewees from Davao did not find the rule of law as a particularly negative concept. Although they acknowledged its theoretical importance to upholding human rights and civil liberties, they did not find it particularly effective in addressing the key issues of his presidency, which they were primarily concerned with.

Prompt: Closing questions and stances towards the Duterte administration

For the closing question, the interviewees were asked to relay their thoughts on the Pilipina Southern chapter's endorsement of Duterte during the 2016 presidential elections and why they think a faction of their organization supported him at the time. Figures 5a and 5b depict how the interviewees justified this occurrence in relation to their original stances towards the Duterte administration (see Figures 3a and 3b).

As shown below, interviewees from Manila perceived the Pilipina Southern chapter's decision to endorse Duterte negatively, finding it starkly antithetical to the organization's advocacy. As one Manila interviewee said, she felt "betrayed when progressive organizations expressed support for him" since his remarks and methods should be opposed by all women's organizations regardless of location. Originally, the Manila group was neutral towards Duterte's regional expertise since their knowledge of politics in the southern Philippines and Duterte's mayorship were rather limited. However, this changed in response to the prompt as the Manila interviewees sought to rationalize the regional context behind the chapter's endorsement of Duterte during his presidential bid. Most Manila participants speculated that members of the chapter endorsed Duterte because organization members from the south were conditioned to trust his regional expertise even though his actions do not cohere with the organization's values. Moreover, Manila participants felt that regional loyalties mattered more than organization values during national elections. As one participant put it, the Mindanao chapter's decision to endorse Duterte was most likely because "he was the first Mindanaoan in a very long time (or ever) that had a shot at claiming the presidency" and that the chapter hoped to "uproot Manila's hold" on the national seat of power. These assumptions resulted in the negative conceptualization of his regional expertise.

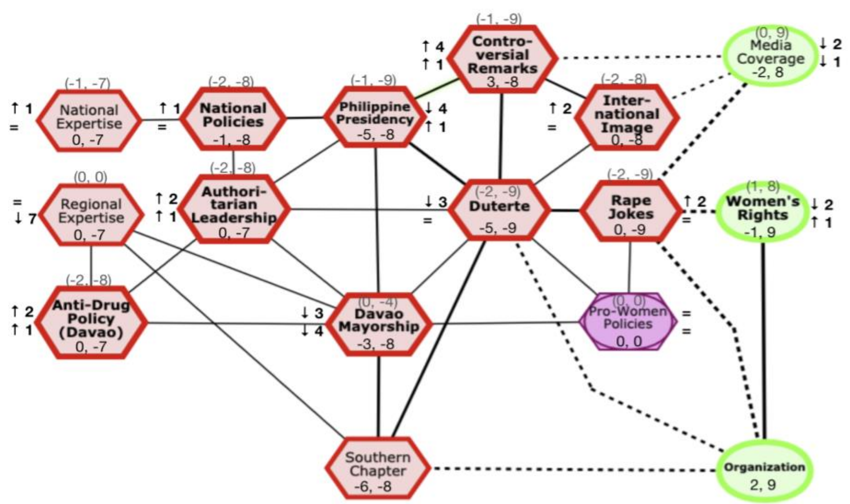


Figure 5a. Manila chapter: Prompted to justify Pilipina Southern chapter's endorsement of Duterte

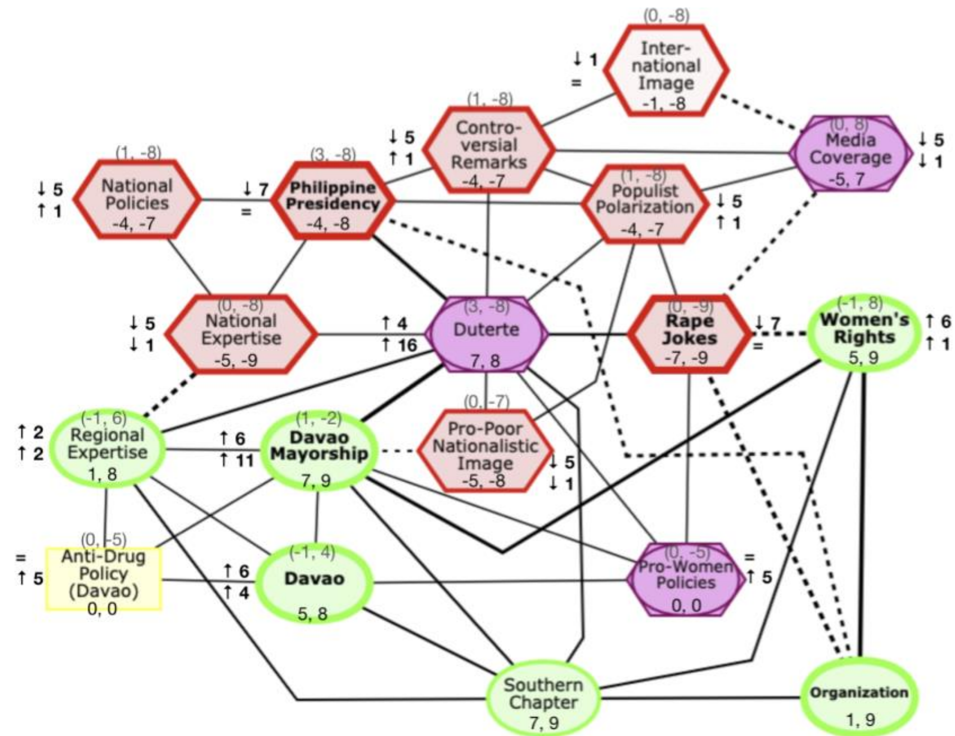


Figure 6a. Davao chapter: Prompted to justify Pilipina Southern chapter's endorsement of Duterte

Meanwhile, the Davao interviewees saw the Pilipina Southern chapter's initial endorsement of Duterte in 2016 as a positive thing. Unlike the Manila participants, they didn't think the chapter's actions betrayed the organization's values or undermined women's rights. Davao participants rationalized that Duterte, as a mayor, was initially perceived as a strong advocate of women's rights and liberalism. As one participant explained, she understood why the chapter campaigned for Duterte at that time because he cultivated very good relations with left-wing organizations during his two decades of mayorship. In justifying their responses to the prompt, Davao participants further emphasized their positive stance towards his Davao mayorship, regional expertise, and Davao itself, highlighting his previous pro-liberal stances and actions as mayor. Yet again, this prompt put his mayorship in the spotlight, elevating perceptions of him despite the Davao participants' negative perception of his presidency.

Afterwards, all the interviewees were asked why they thought the Southern chapter revoked its endorsement of Duterte in 2018, more than a year into his presidential term. The Manila group used this information to confirm their own biases, interpreting it as further evidence that Duterte's presidency is an extension of his long-standing authoritarian tendencies as mayor. Hence, the Manila interviewees associated the Southern chapter's "change of heart" as a realization that "Duterte's pro-liberal stance is a sham because the president only advances the interests of his family, cronies, and the rich," confirming their suspicions. Whereas, the participants from Davao associated the chapter's resolve with a shift in the president's leadership methods and priorities. Unlike Manila participants who found Duterte's authoritarian brand of leadership as the overarching problem, Davao participants rationalized that "Duterte has always been greatly influenced by the people surrounding him" and for this reason, "as a president, he's so different from how he acted as mayor." This signified a possible occurrence of conceptual change among Davao participants in their perception of Duterte sometime between his mayorship and presidency.

Conclusion and Recommendations

The insights derived from this case study reaffirmed the increasing relevance of cognitive-affective paradigms in political ideology research. The theories of emotional coherence and cognitive dissonance were effective frameworks for understanding the subtle differences not only between two populations, but also between two derivatives of the democratic ideology. This was especially relevant to the Davao population's significantly different perceptions of Duterte, particularly the concepts related to his mayorship. The significant differences in their responses to this part of the survey confirmed that regional contexts did affect political opinions, even when the strength and orientations of the two populations' cognitive functions were relatively similar. Moreover, the closing questions to the in-depth interviews revealed that the two populations exhibited cognitive bias and psychological resolve, specifically, to cope with information that contradicts the very purpose of their organization.

The findings also supported the democratic paradox theory, given the two chapters' different democratic priorities. The distinct ways members from these two chapters framed their answers imply that there are indeed two distinct theories of democracy that shape perceptions differently in politically polarized environments. The fact that the subjects came from the same organization and have similarly strong stances towards polarizing issues makes this an even more interesting finding about the dual role of the democratic paradox as a personal psychology and political philosophy. While this supports the democratic paradox theory as a paradigm of ideology, this does not necessarily affect the political stances of those who exhibit such tendencies. Although liberalism and democracy are arguably two philosophies that can be used as distinct psychological frameworks in forming political opinions, they were not enough impetus for massive shifts in political stances. This was evident in the statistically significant but overall insignificant differences in the Manila and Davao populations' stances towards the two controversial policies enacted by the Duterte administration. As depicted in the CAM simulations, small adjustments in valences and activations were made by the subjects when dealing with cognitive dissonance. However, such adjustments were not enough to instigate conceptual change. Future studies should focus on simulating conceptual change in political ideology as a complex neural network and cognitive phenomena. Such an approach can potentially generate insights on the growing support for populism and, in a broader sense, the processes of constructing, deconstructing, and creating political support.

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NATURAL ANG APPLIED SCIENCES

Impact Assessment of Seaweeds Culture of their Inter-Island Seaweeds Association in Cawayan-Placer, Masbate

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Abstract - Part of the FishCORAL project is the rollout of the livelihood projects which would respond to the objective of reducing poverty incidence of fishing communities. One of these livelihood projects was the inter-island seaweeds culture of Cawayan and Placer in Masbate. Descriptive research design and purposive sampling were used in the study. Structured survey questionnaire was utilized and employed interview and focus group discussion as means of collecting information from the target respondents. Data revealed that the majority of the respondents dwell in a single house with five members and have a monthly income of P10,252.00 which is not enough to finance household expenditures due to a large number of dependents. They don't have possession of the lot where their houses are situated. Many are challenged for sources of safe and affordable drinking water. Women empowerment in the area is fair, although disempowerment is high at 51%. Seaweeds project in inter-island barangays does not have significant impacts on the lives of the beneficiaries because poverty incidence is higher than the set poverty threshold. Its effectiveness and efficiency could not be fully assessed although there are glaring pieces of evidence of the major challenges along with these criteria. Putting suitable intervention on the target coastal communities with close coordination on concerned agencies and proper monitoring of the project should be considered by the implementing agency to address the findings in this study. Capability development of livelihood beneficiary association along with financial literacy, basic business management, and record keeping shall be carried out.

Keywords - impact assessment, inter-island seaweeds, Fish CORAL, poverty, women empowerment

Introduction

Poverty is one of the restraining forces that pull a nation to become a progressive country. In the Philippines, fisherfolks posted second highest poverty incidence (26.2%) among 14 basic sectors identified in year 2018 (Philippine Statistics Authority, 2020). Philippines has a total of 200,000 hectares available for seaweeds farming along coastlines and only 60,000 hectares are being utilized or farmed for seaweeds in coastlines (Seaweeds Industry Association of the Philippines, 2015). In this situation, Philippines mobilizes its agencies and ordered the Department of Agriculture-Bureau of Fisheries in collaboration with International Fund for Agricultural Development (IFAD) by utilizing the intended area for seaweeds production through livelihood programs or projects to alleviate poverty among fisherfolks. As a response, DA-BFAR implemented the Fisheries, Coastal Resources, and Livelihood Project (FishCORAL) in the four regions of the Philippines namely Bicol, Eastern Visayas, CARAGA and ARMM. The main goal of FishCORAL is to help improve the quality of life for marginalized people like coastal communities by providing them with access to livelihood opportunities, health care, and protection.

One of the livelihood projects implemented in the Bicol region, particularly in the Province of Masbate, is seaweed culture or farming. The main goal of this program is to generate employment and help the fisherfolks of Masbate to improve their lives especially those living in coastal areas being hit or affected by typhoons. It is believed that seaweed's farming is one of the most economical and eco-friendly livelihoods for fisherfolks because of its economic benefits like food and source of industrial and nutritional natural products (Trono, 2014). Seaweed's culture is easy to establish because it requires only simple techniques and paraphernalia and suited for small-scale village operations (Philips, 2009). Greener Ideal expounded that seaweed farming is important in generating employment. Encouraging local people to protect and value their seawater and its resources, easing pressure on local fish stocks, and reduce overfishing by reducing the economic necessity of fishing to survive.

According to the report of Seaweed Industry Association of the Philippines (SIAP) in 2015, Philippines produced 1,566,361 wet metric tons of seaweeds and 101,900 metric tons of dried seaweeds and Bicol region ranked 6th with a total production of 55,382.09 metric tons. Moreover, the association also reported that the Philippines earned an export income amounting to 250,000 US dollar in 2014 and there is decline of income during 2015. The potential export markets of the Philippine Seaweeds are USA which imported 12,321.7 metric tons (29.17%), Europe 7,244.3 metric tons (17.15%), China 4,004.5 metric tons (9.48%). In year 2020, Philippines got a gross value of 10.60 billion on its seaweeds production (PSA, 2020) and this indicates that seaweeds culture or farming is a vibrant livelihood for fisherfolks and need to be sustained to boost the Philippine economy because it contributes 33.3% to the total fisheries production of the country.

DA-BFAR commissioned Bicol University in partnership with Dr. Emilio B. Espinosa Sr., Memorial State College of Agriculture and Technology (DEBESMSCAT) to conduct a Rapid Project Impact Assessment (RPIA) for Albay, Ragay and Asid Gulfs on the five-year implementation of the FishCORAL projects specifically on inter-island seaweeds located at Cawayan-Placer, Masbate.

The objectives of this assessment are to; (1) identify inputs, outputs and outcomes of seaweed enterprise of the Inter- Island Seaweed Association in Cawayan and Placer, Asid Gulf; (2) analyze the impact pathways of the seaweed enterprise of the Inter- Island Seaweed Association in Cawayan and Placer towards the key performance outcomes of FishCORAL project; (3) assess the economic and social impacts of the seaweed enterprise of the Inter- Island Seaweed Association in Cawayan and Placer; and (4) document lessons to improve the implementation of fishery policies, programs and plans for effective livelihood initiatives.

Methodology

Research Design

The study used a descriptive research design in which it sought to accurately and systematically assess or describe the impact of the FishCORAL project in Cawayan and Placer, Masbate. Purposive sampling was used in this study. A total of 189 fisherfolks serve as the respondents of this study in which they are visited and carefully interviewed to gather first-hand and factual information.

Various methods were utilized to gather data like; field survey, observation, and focus group discussion (FGD). During the field survey, the researcher visited the households of the beneficiaries of the project and interviewed using a structured survey questionnaire to gather information on the socio-economic characteristics, asset ownership, and women empowerment. If the target beneficiaries were not around, a representative from the family who has knowledge of the livelihood project was interviewed. Observation was also performed to verify the information obtained from the respondents. FGD was resorted to make the most of the substantial presence of respondents. The participants during the FGD were the Officers and members of the organization.

Limitations of the Study

The main limiting factor of this study is the COVID-19 pandemic which researchers need to comply with all the travel requirements and restrictions before entering the target municipalities. Also, observance of health protocols during the interview became difficult on the part of the researcher because the question should be repeated many times for the respondents to hear it. Another limiting factor is the peace and order situation specifically in the municipality of Cawayan because most of the barangays were allegedly situated wherein the armed conflict is frequently happening. The unavailability of the financial records hampers the smooth process of data collection because there are fields in the questionnaire that require financial aspects and these records are important in analyzing the impact of FishCORAL project. However, some data that cannot be obtained from the respondents are being answered by the community facilitators and MAO of the respective municipalities.

Analytical Design

Descriptive analysis was used in the analysis of all gathered data. This research used mean, frequencies and percentage as statistical tools in analyzing the socioeconomic features and livelihood asset ownership of household beneficiaries. Women empowerment was measured based on the ten indicators of the 5DE. Percentage of poverty was computed and compared with poverty threshold set by the Philippine Statistics Authority as of 2018. OECD-DAC evaluation criteria was used to assess performance of project according to relevance, effectiveness, efficiency, impact, and sustainability.

Results and Discussions

Analysis of the Household Socioeconomic Characteristics

Table 1 showed the result of the household socioeconomic characteristics of the 75 beneficiaries of the project in the municipality of Cawayan and Placer. Data showed that the majority of the household members are aged 16-64 which comprises 69% of the total population surveyed. This age group conformed to the study conducted by Tan (2020) in which stated that the average age of members of the household is 45 to 52 years old. Additionally, this age bracket is considered as the working-age group and potential working force of the fishing industry since it contributed about 34% of the Philippine economy. The remaining 31% is considered as the dependent age group of the household (Age 15 and below (30%) and 65 and above (1%). The age dependency ratio of both youngest and oldest age group is 45.21% which means in every one worker there are two dependents. The computed dependency ratio is much lower compared to the Philippines' age dependency ratio (55%) and world age dependency (54.57%) (World Bank, 2021).

Most household beneficiaries were composed of 5 members (61%) which is comparable to the average household member in the Bicol Region with 5 members. (PSA, 2012). The average household income of the beneficiaries is P10,788.31 which is classified as poor and few household incomes (P44,904.00) are classified as middle earner (PIDS, 2018). Majority of the household beneficiaries (81%) dwell on a single house compared to those households who reside in a duplex or attached types which comprised 19%. In terms of the housing wall, 43% were made up of material, 37% light materials, 11% mixed but predominantly strong materials, and 9% mixed but predominantly light materials. Majority of household roofing's were made up of strong materials (77%), light materials (16%), mixed but predominantly strong materials (4%), and mixed but predominantly light materials (3%) respectively.

Table 1. Households' Socioeconomic Characteristics

Socio-Economic Characteristics	Frequency	Percentage
Age Group		
15 and below	117	30
16 – 64	272	69
65 and above	3	1
Age Dependency Ratio		44.11
Child Dependency Ratio		43.01
Old-age Dependency Ratio		1.10
Household Size		
1-5	46	61
6-10	28	37
10 and up	1	1
Types of Dwelling		
Single House	17	81
Duplex	4	19
Types of Outer Wall		
Strong Materials	32	43
Light Materials	28	37
Mixed but predominantly strong materials	8	11

Mixed but predominantly light materials	7	9
Types of Roofing		
Strong Materials	58	77
Light Materials	12	16
Mixed but predominantly strong materials	3	4
Mixed but predominantly light materials	2	3
Household Monthly Income		
Range	1,733-44,904	
Mean	10,788.31	
Median	8,800.00	

Utilities and Sanitation

Electricity is available, and households (100%) in the islands of Cawayan and Placer have access to electricity (Table 2). Most (46%) are connected to electric cooperatives, almost half (33%) have their own generators, other 20% of the households are connected to electric distribution companies and few (2%) tapped electricity in any of these from their neighbors. Although power connection appears to be good, it is important to stress here that the period of time they are energized is limited as most of them have it at dusk and until midnight only. In terms of water, majority (69%) of the households procured mineral water from neighboring water refilling stations which is higher compared to 24.90% as reported by Tores et al. 2019. The disparity is due to the fact that the latter is for the entire Asid Gulf. Some households (11%) have access to unprotected sources of water and these households are at risk because the water is easily contaminated with bacteria and other impurities that could lead to transmission of deadly diseases. WHO (2019) reported that 485,000 people died each year due to diarrheal disease. Six percent (6%) of the households are connected to a community water system either pipe dwelling or public taps. One percent (1%) of the households have access to a community deep well and others are from the creek.

More than half (52%) of household respondents in Cawayan and Placer have claimed they have a septic tank or secured toilet facilities. However, 16% of the households don't have toilet facilities and they utilize the field to dispose human waste. The remaining households (comprising 32% of respondents) utilized flush to pit latrine (8%) neighborhood toilet (5%), public toilet (5%), bucket (3%), open pit (3%), flush to open drain (3%), flush to anywhere (3%), open bowl (1%) and pit latrine with slab (1%). It appears that more than one third of the households who are members of the association implementing the seaweed culture don't have safe and sanitation compliant toilets.

Table 2. Utilities and Sanitation

Utilities and Sanitation	Frequency	Percentage
Source of Electricity	21	46
Electric cooperatives		
Generators	15	33
Utilities (Electric distribution companies)	9	20
Neighboring household	1	2
Source of Drinking water		
Mineral water	52	69
Unprotected (open dug well)	8	11
Developed spring	5	7
Protected well/tube well/borehole/water pump	4	5
Community water system piped into dwelling	2	3

Community water system piped into public taps/standpipe	2	3
Community deep well	1	1
creek	1	1
Toilet Facilities		
Bucket	2	3
Flush to don't know where	2	3
Flush to open drain	2	3
Flush to pit latrine	6	8
Flush to septic tank	39	52
No facility/bush/field	12	16
Open pit	2	3
Pit latrine with slab	1	1
Bowl open	1	1
Neighborhood	4	5
Public toilet	4	5

Analysis of the Livelihood Asset Profile of Households in the Study Area

Different assets of the inter-island seaweed beneficiaries of Cawayan and Placer were keenly gathered and evaluated. Evaluation of the different assets is very important in determining the life status of the beneficiaries as far as the seaweeds project is concerned. During analysis, there are five assets identified namely, 1) physical assets; 2) social assets; 3) human assets; 4) financial assets, and 5) natural assets.

Physical Asset

In terms of house ownerships, 33% households have possessions on their house and lot (Table 3). This is much lower to 50.97% as reported by Torres, et al, 2019. The respondents who owned their house but rent a lot is 13%. Four percent (4%) of the respondent occupied the house and lot that they do not own for free is almost similar to the finding of Torres, et al, 2019 (3.89%). The remaining 2% is for respondents who own their houses situated in a lot without the consent of the owner (1%) and own their houses but rented a lot (1%). Since 100% of the households have connection to electricity regardless of the sources, it's not surprising that majority (87%) of the household assets are electrical. Such as cellular phones and television set (68%). Motorized boat (65%) is the main equipment used by the respondents in fishing and delivering their catch to the buyers. Motorcycle/tricycle (27%) including bicycle (11%) are the main transportation asset used by the respondents in travelling via land to economize travelling expenses. Other household assets are stove with oven/gas range (27%), radio (23%), CD/VCD/DVD player (17%), washing machine (11%), refrigerator/freezer (9%), component/stereo (7%), personal computer (3%), sewing machine (3%) and aircon (1%).

Table 3. Household Physical Assets.

Household Physical Assets	Frequency	Percentage
Tenure status		
Own house, rent-free lot with consent of the owner	34	45
Own or owner-like possession of house and lot	25	33
Own house, rent lot	10	13
Rent-free house and lot with consent of the owner	3	4
Own house, rent-free lot without consent of the owner	1	1
Rent-free house, lot rent	1	1
Household Conveniences		
Cellular phone/mobile phone	65	87
Television Set	51	68

Motorized boat/banca	49	65
Motorcycle/Tricycle	20	27
Stove with oven/gas range	20	27
Radio/radio cassette	17	23
CD/VCD/DVD player	13	17
Washing machine	8	11
Bike/Bicycle	8	11
Refrigerator/freezer	7	9
Component/Stereo set	5	7
Personal computer	2	3
Sewing Machine	2	3
Air conditioner	1	1

Social Assets

The Organisation for Economic Cooperation and Development (OECD) defined social capital networks together with shared norms, values and understandings that facilitate co-operation within or among groups. Table 4 showed that beneficiaries in Cawayan and Placer have outstanding loans at the time of the survey. Majority (86%) of the respondents credited to their livelihood association which means their organization is active in helping the members in times of crisis. Some (49%) have an outstanding loan from microfinance group, religious group (22%), agriculture/fishery producers' group.

Table 4. Household Social Assets

Household Social Assets	Frequency	Percentage
Livelihood Associations	32	86
Credit or microfinance group	18	49
Religious group	8	22
Agricultural/livestock/fisheries producer's group	4	11
Local Government	3	8
Mutual help or insurance group (including burial societies)	1	3
Civic groups (voluntary associations)	1	3
Other Women's group	1	3

(11%), LGU (8%), insurance group (3%), civic group (3%) and other women's group (3%). The reason for borrowing money from various financial institutions/groups is to finance their fishing activities. Borrowing money is also a usual practice of income supplementation of coastal communities especially during months when fishing and other economic activities are not practicable or nil.

Human Assets

Human assets are simply the working force of a certain community or country as a whole. Human asset is one of the factors of production which is necessary for the creation of goods and services. Based on the data gathered, majority of the respondents in Cawayan and Placer fall under working or active labor force. Table 5 showed the sex-disaggregated data on the educational attainment of the inter-island seaweeds beneficiaries. It is noted that most males (42%) and females (35%) were graduates of elementary. It is much lower to the findings of Torres, et. al, (2019) which is 53% respectively. Males (23%) and females (24%) have finished secondary education, males (20%), (9%) and females (19%), (11%) did not complete their elementary and secondary education. Both males and females (3%) were college undergraduates, and another 3% of both males and females completed their college studies.

Table 5. Household Human Assets

Household Human Assets	Male		Female	
Educational Attainment	Frequency	Percentage	Frequency	Percentage
Elem Graduate	28	42	13	35
High School Graduate	15	23	9	24
Elem Undergraduate	13	20	7	19
High School Undergraduate	6	9	4	11
College Undergraduate	2	3	3	8
College Graduate	2	3	1	3

Financial Assets

Financial asset is one of the important factors of production because without finances, establishment of everything in business is impossible. Most of the respondents of inter-island seaweeds in Cawayan and Masbate are worried about their finances. During the conduct of the study, sources of income are being scrutinized and recorded accurately. Table 6 showed that the primary economic activity of the respondents is fishing (76%) which conformed to the findings of Torres et, al, (2019). Some incomes were derived from masonry (6%), public officials (6%), farming (3%), clerks (2% and trading (2%). Beneficiaries have an average monthly income of P10,252.00 and comparable to monthly income as reported by Torres et al (2019) which is P10,271.26. Due to their geographical location, respondents in Cawayan and Placer are highly vulnerable to weather disturbances like typhoons and monsoons. Looking at the positive side of the women, their primary duty is to support their husbands in their works and care for their children (62%). They ensured that before and after the work they prepared and served food just to nourish their husband. The income of their husbands is not enough to support the daily expenses of the family that is why women performed other works (24%) and venture in farming (8%) just to augment their family income. Additionally, there are women in Cawayan and Placer who are elected as barangay officials which in return they have their monthly salaries to supplement the income of their husbands.

Table 6. Household Financial Asset.

Female Occupation	Frequency	Percentage
Housewife	23	62
Others	9	24
Farmer	3	8
Brgy. Official	2	5

Table 6. cont.

Male Occupation	Frequency	Percentage
Fisherman	50	76
Laborers/ Unskilled workers	4	6
Officials of Government, Corporate Managers	4	6
No response/Unknown/Cannot Remember	2	3
Others	2	3
Farmer	2	3
Clerks	1	2
Traders and related workers	1	2

Evaluation of the Livelihood Key Performance

One of the reasons why projects fail is because no evaluation is done after its implementation. Evaluation is a tedious process and it is contributory to the successful conduct of the project. This study used the IFAD 2015 Evaluation Manual to assess the performance of the inter-island seaweeds livelihood project in Cawayan and Placer and have adopted the OECD-DAC evaluation criteria, which provide a normative framework used to determine the merit or worth of an intervention laid by IFAD. The following criteria were used in evaluating the performance of the project: (1) relevance; (2) effectiveness; (3) efficiency, (4) impact; and (5) sustainability.

Relevance

Recent data showed that Philippines has a poverty incidence of 16.6 percent as of 2018 (PSA, 2019). According to Regional Office V of DSWD, Masbate ranked second as poorest province in Bicol region. With this present situation, Philippines is mobilizing its agencies to provide appropriate measures to alleviate poverty.

The implementation of the FishCORAL project by DA-BFAR is very timely in efforts to reduce poverty incidence in the province of Masbate. The main goal of the said project is to reduce poverty in poor coastal communities, improve food and nutrition security, and increase household incomes. One of the livelihood projects identified and given to island-barangays of Cawayan and Placer under FishCORAL is the seaweeds enterprise. This livelihood is suited or relevant to the economic activities of the target respondents. During the field visit and interview, it was found out that culturing seaweeds is a potential source of income if it is cultured at the right time and place. Additionally, this is now a vibrant business in Cawayan and Masbate because it is nearest to the target market which is Cebu. People in the island barangays were working hand in hand in establishing seaweeds businesses in their locality to support the market demand at the same time to generate income, particularly in this trying times. However, there are feedbacks from the fishers that projects were not implemented based on the guidelines set by BFAR. Some seedlings were still distributed even though they are already dead. Apart from that, the community facilitators seldom visit the area after distribution. This is alarming as beneficiaries shall be continuously guided and capacitated about the process involved in seaweed production. Respondents suggested that the lead agency should monitor regularly and provide technical backstopping during the project implementation.

Effectiveness

The integrated seaweed culture in Cawayan and Placer somehow failed along with effectiveness according to respondents. During field validation, it was found out that beneficiaries did not benefit much from the project given to them due to the following reasons; 1) Members did not cooperate during the start of the project; 2) Community facilitators don't have clear instruction of what to prepare and how to do it; 3) Chaotic distribution of seaweeds seedlings and there are non-members of the organization who received seedlings supposedly when they should not; 4) Seedlings arrived not in the right time and members are not informed about the arrival; 5) Most seedlings are already dead upon arrival and there are already manifestations of ice-ice disease on them; 6) The area is not ideal for seaweed production because it is prone to typhoons and monsoons; 7) Community facilitators monitor the project not so very often and; 8) Seedlings were given not because of needs but for the compliance to the report to be submitted by the project-in-charge.

Respondents stressed out that the project should be given individually not in a group. Considering some members are dependent only on the officers or individuals who have passion for the given project. Additionally, appropriate training and equipment should be given to them to make the project successful.

Efficiency

The efficiency of the Inter-Island seaweeds enterprise of Cawayan and Placer was not measurable yet. It was noted that the project started through planning and consultation, release of livelihood materials, conduct training concerning seaweeds cultivation, and release of seaweeds seedlings in the mid of February and March 2020. During site visitation in this study, the project did not exist anymore due to multiple reasons and complaints of the beneficiaries. Upon analysis of the responses, the bottom line of the failure of the project is shortcomings on the part of the project implementers. This is further compounded by the weak monitoring and technical service provision of the project initiators. Additionally, some important documents of the association like financial and production records were unavailable and were not presented during the visit. Thus, researchers have difficulty in evaluating the effectiveness and efficiency of the project. Although some hints of inefficiency are glaring, it is hard to conclusively establish this at the moment as records and vital empirical data are not yet in place.

Impacts

Impacts of the project were not properly determined due to the unavailability of the association's documents. Therefore, impact analysis is almost impossible. However, numerous data being gathered and can be used for the initial determination of impacts on the project given to Cawayan and Placer beneficiaries. The study evaluated the following impacts on; 1) household income; 2) poverty reduction; 3) women empowerment; and 4) enterprise development

Household Income

Based on the data gathered from the inter-island seaweeds beneficiaries, 11 out 75 (14.67%) beneficiaries derived their income from the given project. An average of P1,619.09 income for 3 months of operation was reported. This means that there is a need to implement the project effectively to hit the purpose of providing stable source of income for the coastal communities.

Poverty Reduction

Table 7 showed the poverty incidence of the inter-island beneficiaries in Cawayan and Masbate. Majority (87.13%) of the respondents suffered poverty based on income approach. This becomes 89.19% poverty incidence when expenditure approach is used. This data is much higher on the poverty incidence (29.4%) in the province of Masbate as of 2018 (PSA, 2018). Also, data revealed that the higher the household size the higher the family expenses will be. In terms of subsistence incidence, data showed that most (65.57%) families experienced poverty based on income approach while 62% families experienced poverty based on expenditure approach.

Respondents this year (2021) suffered a higher poverty level (87.13%) compared to the baseline (64%) of the FishCORAL (Torres, et al, 2019). Data revealed that intervention did not reduce the poverty incidence in the Cawayan and Placer. In general, the impact of the seaweed culture livelihood project on poverty reduction is negative and needs to be reviewed on what went wrong with its implementation.

Table 7. Poverty Incidence

Poverty Measure	Poverty Incidence (%)	Subsistence Incidence (%)
Income Approach	87.83	67.57
Expenditure Approach	89.19	62

The Women Empowerment in Agriculture Index (WEAI) was used to measure the empowerment of women in the agriculture sector. An overall rating of 80% or higher should be obtained to determine the women empowerment in the workforce. The five domains of empowerment (5DE) are; 1) Production; 2) Resources; 3) Income; 4) Leadership; and 5) Time. Table 8 showed that less than half (43%) or 16 out of 37 inter-island seaweeds women beneficiaries are empowered. This can be those women in their respective barangays who have been given a chance to participate in the different community activities. During FGD it was noted that the majority (94%) of women beneficiaries are members of barangay council and managed some community-based associations.

As a cultural practice, incomes of men out of their work were directly remitted to their spouses that is why women of inter-island seaweeds project beneficiaries were more empowered when it comes to income utilization (97%). In terms of leadership, data revealed that most (92%) women beneficiaries of Cawayan and Placer are empowered. Table 8 also revealed 82% of women beneficiaries preferred to use their free times into household activities and other economic activities to make it productive.

In the control of production aspects, women beneficiaries were less empowered when it comes to production decisions on inputs (43%) and autonomy in production (30%) which was validated during FGD. When women beneficiaries became empowered in production matter, this will be a big help in uplifting their social status in their respective communities. The rate of women's empowerment is still lower than that of men. On the grounds that women are prevented from entering into the workforce because of the gender role stereotype that exists in the Philippines. Women beneficiaries of Cawayan and Placer is now heading to equalize to men in terms of economic activities because during interview and observation in the area, most women are breadwinners of the family.

Sustainability

Ensuring sustainability is one of the most important part of a livelihood project. In the case of the inter-island seaweeds project, beneficiaries were not able to sustain it because of major flaws right at the start of its implementation. The culture set-ups within the project were implemented in different months. Some beneficiaries started their project last 2020 and others in mid of February and March 2021. One of the major factors that hindered the sustainability of the project is timing and the geographical location of the respective areas which are prone to siltation, destructive wave action and elevated seawater temperature. An additional factor that hampers the sustainability of the project is the quality of the seaweed's seedlings. Majority of the seedlings were already dead upon arrival or receipt by the beneficiaries. There is a considerable level of unreadiness in the association itself in leading the seaweed culture venture toward a long term and profitable ends. The disinterest now of considerable proportion of members is high and many will discontinue their participation in the livelihood project. These would have serious impacts to the envisioned long-term beneficial persistence of the venture.

Table 8. Women Empowerment Ratio

Indicators	Empowerment Ratio	Disempowerment Ratio
Production		
Input in productive decisions	43	57
Autonomy in production	30	70
Resources		
Ownership of assets	65	35
Purchase, sale, or transfer for assets	49	51
Access to and decisions on credit	62	38
Income		
Control over the use of income	97	3
Leadership		
Group member	92	8
Speaking in public	73	27
Time		
Workload	89	11
Leisure	76	24
Disempowerment Headcount Ratio	57	
Empowerment Headcount Ratio	43	

Conclusions and Reccomendations

The project's goal which is to reduce the poverty of coastal communities was not materialized due to some significant reasons obtained from the respondents. It was concluded that seaweed's enterprise was a potential livelihood project that will help the fisherfolks to augment their family income if implemented properly. None of the beneficiary's income is higher than the set poverty threshold of ₱2,257.00 per month. Household size is composed of 5 members with 2 dependents per provider. Most beneficiaries have access to electricity while it is alarming in terms of access to safe drinking water. Households have outstanding loans from different credit institutions. Some fishers' associations were able to support their members through granting of financial loan with minimal interest. Women, although with still high disempowerment (51%) appear to have become active agents of changing the landscape of the family's economic activities. Community facilitators don't have regular coordination with concerned LGUs and the beneficiary association therefore, project implementation was not properly guided and monitored. Respondents also noted poor response to the problems and concerns sent by the beneficiaries about the project. LGU officials expressed some frustrations as it appeared that the responsibility for the project is turned over to them fully. Effectiveness, efficiency impacts and sustainability of the project could not be fully assessed at this moment although glaring indicators that may hinder its attainment are readily observable from the project site, inside the association and within its peripheral support system. In totality, the seaweeds project in inter-island barangays does not have significant impacts (yet) on the lives of the beneficiaries specifically on income generation aspects, more so along with poverty reduction objective.

Site suitability studies should be carried out to identify the most appropriate location of the farming site. Likewise, appropriate advice as to the proper timing of farming should be afforded to avoid losses due to inclement weather conditions. There is a need to review the membership and allow only those who would unselfishly commit to participate and not just depend on those who would work. The DA-BFAR community facilitators should have better coordination to LGUs and regular monitoring and technical service provision to the association for smooth implementation, monitoring and evaluation of the projects. Again, facilitators should address immediately the problems and concerns being raised by the beneficiaries to avoid project failure. Capability training should be provided to all project beneficiaries specifically on financial literacy, record keeping, and basic business management to meet the ultimate purpose of the laid intervention.

Acknowledgment

The authors would like to extend their warmest gratitude to Bicol University, the United Nation-International Fund for Agriculture and Development (UN-IFAD), Regional Office and Masbate Province field office of Bureau of Fisheries and Aquatic Resources (BFAR), Cawayan and Placer LGU officers, component leaders, project leaders, and study leaders of Rapid Project Impact Assessment team, and especially to Dr. Emilio B. Espinosa Sr. Memorial State College of Agriculture and Technology for the collaborative assistance to the study leaders, participants and to all the people who made this study a success. Thank you very much.

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Mechanism of Anti-Platelet Aggregation Activity of Canna Warszewiczii (A. Dietr) Fractional Extracts

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Abstract - Background: Canna warszewiczii (A. Dietr) has been used as a traditional medicine to prevent and treat cardiovascular diseases because of its various effects, including anti-platelet aggregation effect. Objectives: This study aims to explore the mechanism of antiplatelet aggregation activity of fractions extracted from Canna warszewiczii (A. Dietr) through theirs against ADP induced platelet aggregation. Canna warszewiczii (A. Dietr) extracts were prepared as our previous study. Pyridoxalphosphate-6-azophenyl-2',4'-disulfonic acid tetrasodium (PPADS) was used as P2 receptor inhibitor. Human platelets-rich plasma were incubated with ethyl acetate (EA, 4 mg/ml) or dichloromethane (DCM, 12 mg/ml) plus PPADS (100 µM). Platelet aggregation was analyzed by using Light Transmission Aggregometry (LTA) on Chrono-Log-490 with some parameters including Slope, Maximal platelet aggregation percentage (MPA), De-aggregation (DEA) and Area Under the aggregation Curve (AUC). EA and DCM fractions with or without PPADS decreased platelet aggregation parameters when compared with the negative control sample and DMSO 0.5%. EA plus PPADS and DCM plus PPADS had platelet aggregation slope, MPA percentage and AUC significantly lower than the single herbal samples as well as single PPADS ($p<0.05$). However, the de-aggregation (DEA) of samples were not significantly different ($p>0.05$). DCM fraction and DCM plus PPADS showed the fastest and completed platelet de-aggregation. The DCM and EA fractions extracted from Canna warszewiczii (A. Dietr) showed inhibitory activity on platelet aggregation induced by ADP. The antiplatelet aggregation effect of fractions was more obviously displayed in combination with PPADS suggested role of P2 receptor in Canna warszewiczii (A. Dietr) extracts induced platelet aggregation.

Key words - Antiplatelet aggregation, Canna warszewiczii (A. Dietr), PPADS, ADP.

Introduction

Platelets and blood coagulation factors play a pivotal in atherothrombosis and cardiovascular diseases such as angina pectoris, myocardial infarction… [1,2]. Recently, synthetic antiplatelet drugs, for example aspirin, have used to treat and prevent the formation of thrombosis. However, these drugs can cause some serious side effects (e.g., hemorrhage, gastrointestinal ulcer, drug resistance) [3,4]. Therefore, the herbal medicine and natural compounds with antiplatelet potential have been concerned in medicinal researches to find alternative therapies with less adverse effects [5].

Canna warszewiczii (A. Dietr) is one specie of the Canna genus in the family Cannaceae. In the world, it has been found in some mountainous regions in South America, China and Vietnam. In Vietnam, this specie has been traditionally used to assist in treating and preventing some heart diseases like coronary artery disease, myocardial ischemia and some other disoders. Recently, there are some studies investigating the pharmacological effects of Canna warszewiczii and its pure compounds in controlling cardiovascular diseases. Mirsha et al. indicated that flavonoid and phenolic compounds from C. edulis rhizomes had antioxidant properties [6]. In other study, the potent antiplatelet aggregation, anticoagulant and antioxidant activity of C. edulis rhizome and its compounds have been proven by Nguyen et al (2020) [7]. The ethyl acetate extract of leaves, shoots and rhizomes of Canna warszewiczii showed anticoagulant activity through prolonging both PT and APTT parameters [8]. In our previous study's result, C. warszewiczii fractions including n hexane, dichloromethane, and ethyl acetate (EA) fractions significantly inhibited ADP , collagen , and ristocetin platelet aggregations [9]. To supply scientific evidences for antiplatelet aggregation mechanism of C. warszewiczii fractional extracts, this study has used a P2 receptor inhibitor called PPADS. The result of study can contribute to illumine the benefit of C. warszewiczii in cardiovascular disease through its effects on platelet.

Methodology

Plant extractions and chemicals

Canna warszewiczii (A. Dietr) extracts were prepared as our previous study [9]. The aerial of plant was harvested in Thai Nguyen province, Vietnam, then extracted into different fractions including dichlomethane and ethyl acetate fractions. Two fractions with the obtained residues after evaporating solvents were diluted in DMSO 0.5% to give concentrations of 40 mg/mL (ethyl acetate [EA]) and 120 mg/mL (dichloromethane [DCM]).

Adenosine diphosphate (ADP), an agonist of P2Y receptor in platelet, were purchased from Chrono-Log Corporation (USA). Dimethyl sulfoxide (DMSO), pyridoxalphosphate-6-azophenyl-2′,4′-disulfonic acid (PPADS) tetrasodium and other reagents were obtained from Sigma Aldrich (USA).

Blood collection and plasma preparation

The study protocol was approved by the Research Ethics Committee, University of Medicine and Pharmacy, Vietnam National University, Hanoi, Vietnam. Blood samples were collected from healthy volunteers who were given informed consent. Human volunteers were 20-25 years with no history of thrombosis or hematological diseases and no using medication that affected the blood coagulation process within two weeks. Specimens of blood samples were withdrawn in the morning, then were transferred to a centrifuge tube containing 3.2% trisodium citrate as an anticoagulant (9:1 ratio). The platelet rich plasma (PRP) was obtained by centrifugation at 500 rpm for 10 minutes and the residue was centrifuged at 3000 rpm for 10 minutes to collect the platelet poor plasma (PPP). The platelet count was adjusted to 250 ± 25 × 109/L in PRP by counting pletelets under microscope.

The Platelet Aggregation Assay

The platelet aggregation was performed in triplicate by using the turbidimetric method [10]. In brief, 450 µl PRP with 50 µl herbal fractions at final concentrations of EA 4 mg/mL and DCM 12 mg/mL were incubated at 37°C for 5 min. In other tubes, 445 µl PRP was incubated with 5 µl PPADS 10 mmol/L at 37°C for 30 min, then added 50 µl herbal fractions then incubated at 37°C for 5 min before measuring. Platelet aggregation was induced by ADP at a concentration of 10 µM. The sample with 500 µl PRP was used as a negative control. Parameters were recorded as amplitude time curves over 6 min, including maximal platelet aggregation – MPA, slope of the curve (velocity of aggregation), and the area under the platelet aggregation curve (AUC) which was the most important parameter. In addition to, de-aggregation (DEA) percentage was determined as (Amplitude - FPA)/Amplitude x 100%, FPA (Final Platelet Aggregation) was relatively defined based on aggregation graph.

Statistical analysis

Results are presented as the mean ± SEM and analysed by the SPSS 20.0 (IBM corporation, Armonk, New York, USA) software. One way ANOVA was used for multiple comparisons followed by Dunnett's test in case of a normal variable of interest or Kruskal – Wallis followed by Dunn's test when skewed variable of interest. The data were considered to be significant difference when $p<0.05$.

Results and discussions

The platelet aggregation test is one of ways to assess platelet function. In this study, we evaluated platelet aggregation through four parameters: maximal platelet aggregation (MPA), aggregation slope, the area under the platelet aggregation curve (AUC) and platelet de-aggregation (DEA). The results are performed in Table 1. The results of platelet function between negative control and DMSO were similar.

EA 4mg/mL, DCM 12mg/mL and PPADS samples decreased significantly MPA percentage, aggregation slope and AUC compared with negative control and DMSO samples ($p<0.05$). EA with PPADS and DCM with PPADS showed remarkably lower MPA than PPDAS sample ($p<0.05$). Especially, DCM 12mg/mL plus PPDAS had lower MPA than single plant samples ($p<0.05$). Similarly, the samples with herbal extracts and PPADS also significantly decreased aggregation slope compared to other ones ($p<0.05$). AUC result of DCM with PPADS were significantly lower than that of EA or PPADS sample ($p<0.05$). About deaggregation, negative control and DMSO samples did not occur this event, and DEA of samples were not significant different ($p>0.05$). Eventhough, the samples containing DCM had strongest platelet deaggregation [Table 1].

The chart of platelet aggregation of samples is presented in Figure 1. The negative control (A) and DMSO (B) samples showed the featured curve of platelet aggregation process in vitro induced by ADP that including two phases. The graph of samples with plant extracts or PPADS appeared only primary curve but not secondary curve. The graph showed the herbal with PPADS samples had stronger platelet aggregation activities than single herbal samples. The deaggregation of DCM samples occurred fastest and completely [Figure 1].

Table 1. The platelet aggregation parameters of samples

Sample	MPA (%)	Slope	AUC	DEA (%)
(a) Negative control	100	81.67 ± 2.40	281.27 ± 20.33	0
(b) DMSO 0.5%	96.03 ± 2.19	85.00 ± 4.36	272.93 ± 21.31	0
(c) PPADS 100 μmol/L	51.56 ± 11.53^{ab}	58.80 ± 5.30	143.14 ± 40.27	27.99 ± 14.50
(d) DMSO 0.5% + PPADS 100 μM	35.22 ± 4.42^{ab}	52.00 ± 2.08^{b}	73.70 ± 18.78	53.32 ± 22.69
(e) EA 4 mg/mL	42.75 ± 5.24^{ab}	61.80 ± 3.40	93.60 ± 25.04	67.70 ± 13.42
(f) EA 4 mg/mL + PPADS 100 μM	21.17 ± 5.52^{abc}	34.20 ± 7.79^{abce}	56.52 ± 17.81^{ab}	38.43 ± 16.17
(g) DCM 12 mg/mL	42.67 ± 4.74^{ab}	63.75 ± 6.18	50.85 ± 24.83^{ab}	94.12 ± 5.88
(h) DCM 12 mg/mL + PPADS 100 μM	9.50 ± 3.82^{abceg}	26.25 ± 4.85^{abceg}	5.28 ± 2.49^{abce}	75.00 ± 25.00
p	$p_{ANOVA} = 0.000$	$p_{ANOVA} = 0.000$	$\mathbf{p_{Kruskal\text{-}Wallis} = 0.002}$	$\mathbf{p_{Kruskal\text{-}Wallis} = 0.097}$

DMSO: Dimethyl sulfoxide, PPADS: pyridoxalphosphate-6-azophenyl-2′,4′-disulfonic acid, EA: ethyl acetate fraction, DCM: dichloromethane fraction, MPA: maximal platelet aggregation, AUC: the area under the platelet aggregation curve, DEA: platelet de-aggregation.

a: $p<0.05$ when compared with negative control; b: $p<0.05$ when compared with DMSO; c: $p<0.05$ when compared with PPADS; e: $p<0.05$ when compared with EA; g: $p< 0.05$ when compared with DCM.

In our previous study, we found the antiplatelet property of C. warszewiczii A. Dietr's fractions induced by different agonists such as ADP, collagen, and ristocetin [9]. In this study, we have continued to investigate deeply about the mechanism action of the plant's extracts in ADP- induced antiplatelet aggregation through PPADS. Light transmission aggregometry (LTA) is a good method for monitoring the pharmacologic effects of antiplatelet agents [11,12], therefore, we chose this technique in our study. ADP is a platelet aggregation agonist through P2Y1 and P2Y12 receptors in platelet membrane. We used PPADS as a non-specific P2 receptor inhibitor to predict mechanism of antiplatelet aggragation of C. warszewiczii fractions. The data was presented in Figure 1. PPADS itself had an inhibitory effect on ADP-induced platelet aggregation. The result meant that ADP-induced platelet aggregation by P2R that worked in this study (Figure 1C). When PPADS was exposed to platelet together with C. warszewiczii A. Dietr's extracts (DCM and EA fractions) it showed an additive effect on ADP-induced platelet aggregation (Figure 1F and 1H) in comparision with the extract groups themselves (Figure 1E and 1G).

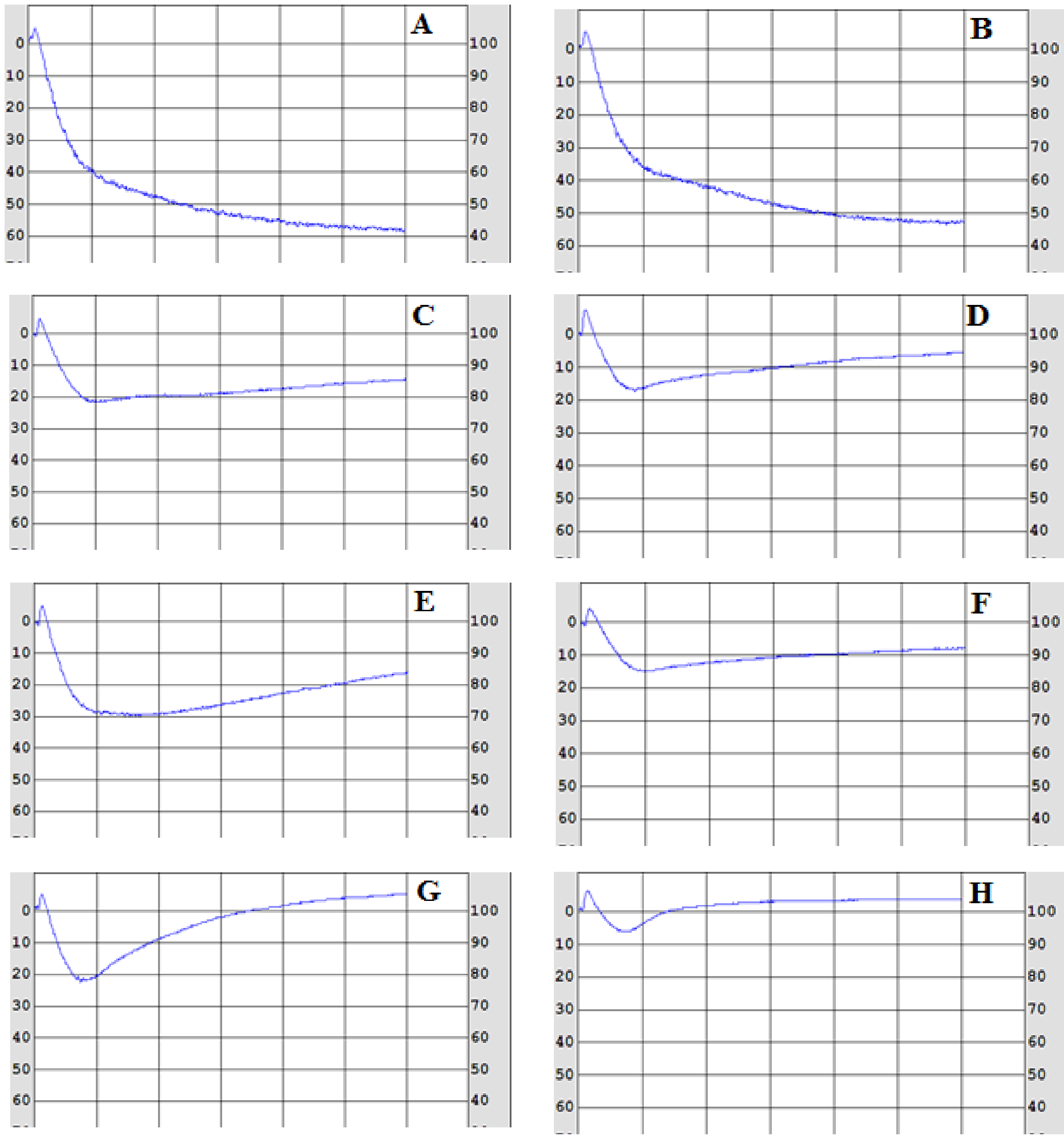

Figure 1. The platelet aggregation diagram
(A: negative control, B: DMSO 0.5%, C: PPADS 100 □M, D: DMSO 0.5% + PPADS 100 □M, E: EA 4 mg/mL, F: EA 4 mg/mL + PPADS 100 □M, G: DCM 12 mg/mL, H: DCM 12 mg/mL + PPADS 100 □M)

Figure 1 and Table 1 represented the platelet aggregation process through a graph and four valuable parameters related to platelet function. The aggregation slope shows the aggregation velocity per min caused by the samples. AUC considered the best parameter to indicate the overall platelet aggregation is determined by the height of the aggregation curve and the slope of the curve. MPA, slope, and AUC were reported in many before studies of platelet aggregation yielded by plant extracts [7,12-14]. According to Table 1 and Figure 1, the samples contained EA, DCM fractional extracts, and/or PPADS obviously reduced velocity of platelet aggregation, MPA, and AUC in comparison with negative control and DMSO 0.5%. These results were similar to our previous study toward EA and DCM fractions of C. warszewiczii [9]. We had isolated several antiplatelet components from this plant in our previous study, which led to many different mechanisms of antiplatelet action. EA fraction contained the highest polyphenol and flavonoid

content, while as DCM fraction contained coumarin and tanin [9]. Polyphenol and courmarin have been identified to inhibit platelet aggregation [15]. Flavonoids have antiplatelet efffect through inhibition of thromboxan, thrombin, collagen and ADP [17-19]. Flavonoids and coumarin have attached abilities to GPIIb/IIIa receptors [17-19] Further investigations are required to better understand the other mode of action of these compounds. This plant had been also proved its antioxidant activity that be involved in the mechanism of antiplatelet effect [19,20]. An antioxidant agent may reduce platelet activity by scavenging lipid peroxides and free radicals that damage arterial endothelium and inhibit prostacyclin synthetase.
Noticably, in the present study, two samples with plant extracts and PPADS had significantly lower slope and AUC than simple plant samples or PPADS. This suggested about the synergistic interaction between the plant and PPADS in the platelet aggregation inhibition. Another new point described in this study was de-aggregation process of platelet that performed breaking the linkage between fibrinogen with GPIIb/IIIa receptors. The platelet de-aggregation appeared in EA, DCM samples and/or PPADS with different velocities of de-aggregation. Two samples contained DCM and DCM with PPADS showed the fastest and completed de-aggregation of platelet.

Conclusion and Recommendations

In conclusion, the results of this study supplied evidence and mechanism of DCM and EA fractions extracted from Canna warszewiczii (A. Dietr) in antiplatelet aggregation induced by ADP. This aggregation effect of fractions was more noticable when combinated with PPADS. Thus, the plant extracts showed the synergistic interaction with PPADS in the platelet aggregation inhibition. This suggested Canna warszewiczii (A. Dietr) extracts had antiplatelet aggregation property through P2 receptors. Therefore, further in-vitro and in-vivo studies with selective activators of P2Y1 and P2Y12 receptors as well as other antiplatelet factors are needed to identify more thoroughly the mechanisms for antiplatelet activity of this plant.

Acknowledgment

The study was funded by Nafosted Project, code number 106.02-2018.334.

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Bacterial Diversity in Asia and the Pacific Arthropods: A Systematic Review

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Abstract - This systematic review examines the bacterial diversity of the phylum Arthropoda in Asia-Pacific. By understanding bacterial diversity, we can escalate our understanding of how bacteria affect an organism's biological processes such as diet, reproduction, and survival. Additionally, it seeks to scrutinize kindred articles that exhibit interchanges between the bacteria and their host. The significance of this systematic review is to interoperate between microbial evolution and host microorganisms, which will contribute to an improved grasp of the interplay nature, which may pave the way for evaluating and planning a more sustainable environment. It will bring to a sufficient understanding of microbiology in the Asia-Pacific region, and its biodiversity hotspots. The overall composition of bacterial diversity in arthropods consisted mainly of Proteobacteria, Firmicutes, Actinobacteria, Bacteroidetes, Cyanobacteria, and other bacterial phyla. Proteobacteria is the most diverse phylum within the bacteria domain. It is the highest bacterial phyla found in the gut microbiota of species under phylum Arthropoda. Its high abundance has been associated with the strict anaerobes compelled for a healthy gut process by expending oxygen and lowering redox potential in the gut environment for assembling the gut for colonization (Shin et al.,2015). Furthermore, this phylum compromises a variety of well-known opportunistic pathogens, such as Escherichia coli, and Vibrio, which can harm the host. Every bacterial diversity found in arthropods, affects the organism's biological processes (sex, diet, "growth", developmental stages, metabolism, defense mechanism), environment, function, and survival.

Keywords - Arthropods; bacteria; bacterial diversity; host; Asia

Introduction

According to the Food and Agriculture Organization of the United Nations, "The Asia-Pacific region has some of the world's richest concentrations of Earth's biological diversity. It is home to nearly half (17 out of 36) of the world's biodiversity hotspots." Among the fauna, biodiversity is the arthropods, any members of the phylum Arthropoda, which includes lobsters, spiders, mites, insects, and centipedes. It is the largest phylum in the animal kingdom comprising about 84 percent of all recognized animal organisms. One of the biodiversity hotspots of Asia and the Pacific is the Philippines. In the Philippines, about 70 percent of the 1,000 recorded insect species are considered endemic, and this includes Luzon Peacock Swallowtail (Papilio chikae) and Jewel Beetle (Chrysodema manillarum). Different various microbes thrive in the whole biosphere to define the boundaries of life and create conditions for other living beings to survive and evolve. The diversity of microorganisms is vital to the ecosystem's functioning, as ecological processes such as organic matter decomposition, nutrient cycling, soil grouping, and pathogens regulation within the ecosystem must be maintained. The bacterial diversity in the arthropods found in the Asia and the Pacific region is the subject of this systemic study.

The Asia Pacific region is exceptionally rich in biodiversity. The high percentage of plants and animals in the regions' tropical forests, the 'coral triangle' reefs, temperate woods, and huge river basins are among the most unique on Earth. However, along with its vast geography, it inevitably includes factors that are currently threatened by many climatic and human-related issues resulting in biodiversity loss. Direct drivers, such as intrusive pests may offer catalytic effects on the environment and to us humans. Invasive pest arthropod on the environs shows a massive impact on several categories, especially human health and safety. In connection, some of these invasive species are hematophagous examples of which are common insects such as mosquitoes, fleas, bed bugs, and many others, which can transmit several diseases caused by infectious agents. Moreover, invasion of species can serve pathogenic microorganisms they parasitize by harboring to the vertebrate host during a blood meal, which will potentially develop a vector-borne disease.

Arthropods play a crucial part in maintaining ecological health, providing livelihoods and nourishment to human communities, subsistence, and significant pointers of ecological change. For example, honey bees, butterflies, moths, and wasps are indispensable pollination agents. The dust and grains are moved to different yields. Studies say that it is intended to deliver excellent harvest yields. The bee abundance increased significantly with an increasing flower cover (Schrader et al., 2018). For instance, in the influence of pollination in the Coffea liberica W. Bull, or the Philippine Barako. The presence of the bacterial communities indicates a possible ample amount of sucrose in the coffee nectar. However, phenolics and other alkaloids may also significantly affect a flower visitor's central nervous system (Fajardo & Cervancia, 2021). Insect farming and apiculture are thriving industries in the Philippines. Also, it has a long history in the Asia Pacific region as human food or livestock feed. It's a new way to help resource-poor households fulfill the protein deficiency while simultaneously minimizing pests. In various parts of Asia, edible insects are used as a general food source. The demand for edible insects has risen in regions of Asia following improving living conditions (Yen, 2015). Grilled grubs, deep-fried grubs, spicy adobo, and sautéed vegetables are some of the traditional preparations. They used an insect species, Carpenter ants (Camponotus spp.) or kara-kara, a delicacy in Northern Ilocos - a region province within the Philippines. A famous restaurant in the country, Cabalen, also serves edible insects in their menu as their specialty. Mole crickets (Gryllotalpa sp.) are prepared in adobo style. The nutritional content of the dish was assessed, and the result shows that a 150 g serving provided 28 and 74 percent of the recommended daily protein and calorie requirements, accordingly (Barrion-Dupo et al., 2008).

Other arthropods act as decomposers like centipedes and millipedes that break down decayed matter and transform it into soil additives. It plays a significant role in ecosystems as these mechanisms provide plants with the minerals and nutrients they require to survive. Besides, it also keeps dead material from accumulating in the environment. The diversity and succession of arthropods in the Muyong forest in Banaue contribute to the fast rate of leaf litter decomposition and nutrient turnover in the Muyong forest (Magcale-Macandog et al., 2017). These arthropod associations with plants and microorganisms impact the measures of dead organic matter. Some feed straightforwardly on the foundations of living plants. However, most remain alive on dead plant matter and are fundamental to the underlying destroying of the litter, which opens supplements to microbial absorption. The reusing of nutrients includes the variety of microorganisms, parasites, protozoa, and the communication of arthropods (Temanel & Trapse, 2020). The bacterial acquisition by insects initiates the microbial symbiosis and adaptation of these bacterial species to the gut environment for long-term survival and generational transmission.

This review explores bacterial contamination in various fields and analyzes and compares the bacterial diversity from arthropods in Asia and the Pacific. Its significance will determine bacterial evolution and host microorganisms' relationships that will better comprehend the interaction that could pave the way to a more sustainable environment. It can be used to evaluate and can be utilized to assess and plan environment board plans. This information would be a foundation to determining the risk associated with microbial contamination of Asian arthropods for humans and its vulnerability to many environmental issues. It will help in understanding the Microbiology in Asia and the Pacific as it is some of the world's richest biological diversity concentrations.

Methodology

Research Question and Objectives

The researchers employed various methods to ensure no bias and that the articles and literature studied are neither irrelevant nor of poor quality. The researchers created a protocol (inclusion and exclusion criteria). We conducted a thorough and broad but relevant literature search using a search strategy on PubMed, NCBI, and Google Scholar. The screening of abstracts from the studies identified in the search, followed by screening the selected full texts, was carried out following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA).

To facilitate comprehension, the researchers chose the bacterial diversity of arthropods in Asia and the Pacific. Arthropods account for around 84 percent of all documented animal organisms, and they have not yet been sufficiently studied in Asian and Pacific countries to obtain knowledge about them. In this systematic review, we look forward to learning more about the bacterial community and variety present in arthropods and how they affect the host's biological processes.

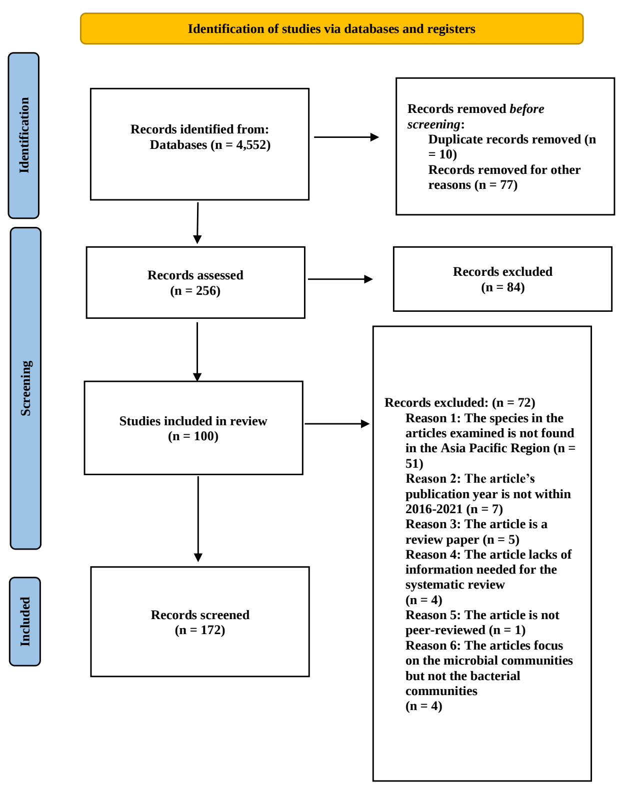
The research questions for this systematic review are as follows:

1. What species of arthropods are found in Asia and the Pacific?
2. What bacterial species are dominantly living within arthropods that could be found in Asia and the Pacific?
3. In what specific parts of an arthropod can bacterial communities be found?
4. How does the bacterial diversity in arthropods affect their biological processes and fundamental characteristics and vice versa?
5. In arthropods, what are the significance of bacterial communities and their diversity to biological processes and overall characteristics?

Inclusion and Exclusion Criteria

Overall, there are 172 articles gathered; however, not all of them passed the inclusion criteria set by researchers. The inclusion criteria include (1) studies covering only the bacterial diversity in marine or terrestrial arthropods, (2) no restrictions in the country of publication but species must exist in Asia and the Pacific, (3) must be peer-reviewed and (4) published within years 2015 to 2021. There are about 72 articles rejected for various reasons, such as (1) researches that tackle bacterial diversity, but species only exist in other countries and have no geographic distribution in Asia and the Pacific, (2) the publication dates of these articles are not within years 2015 to 2021, (3) some are review papers, (4) some lack of information needed, (5) not peer-reviewed, (6) some research that tackles microbial diversity, but only focuses on fungal and viral activities.

Prisma Model



Search Strategy

In order to improve search words, the researchers made sure to include all the relevant terms. Terminologies and phrases from other retrieved articles and papers were also used as a source. To search for an article that is peer-reviewed and relevant to our topic, we use these descriptors and keywords in different search databases such as PubMed and Google Scholar. We used the phrases: "bacterial diversity" [2015-2021] Asia and the Pacific or "bacterial diversity of" [arthropod] the [country found in Asia and the Pacific] or "bacterial diversity" [arthropod] [part of arthropod, e.g., gut].

After testing various search phrases, we found the most effective combination for PubMed, Google Scholar, and other scholarly websites include: "bacteria," "bacterial diversity," and "arthropod bacterial diversity." It can also be "microbiota/microbiome", "arthropod microbiota/microbiome", "bacterial diversity of [arthropod] in the Asia and the Pacific or [input a specific country found in Asia and the Pacific]" [Scholarly journals/ peer-reviewed article], or "bacterial diversity of" [arthropod] [body part]. Studies for the topic are narrow, so the researchers do not count the result terms that have no connection to biological processes and arthropods found in Asia and the Pacific as a search term to yield more results or studies. We left out statements about the results, including such words could prevent search engines from retrieving data.

Research Gaps

Based on various literature reviews that the reviewers have been data-mined, there are unequivocal research gaps encountered together with the incoherent beginning of many articles, and the introduction parts are widely open and do not pinpoint the main focus of the research enough. Most of the introduction parts were too broad to elucidate concrete details in the paper to eliminate gaps and unanswered questions. Furthermore, a few of the first sections of articles gathered, talked about the reproduction, nutrition, evolution, and resistance of arthropods alone, neglecting the bacterial diversity and other important details needed in the review that results in gaps in expounding the introduction.

It is doubtful that most authors wanted to leave these questions unanswered, yet how can an individual understand the literature review completely with such enormous gaps. Many areas mentioned in several sections of the literature reviews are the microbial evolution of arthropods but missed to characterize which part of the specific arthropod that bacteria could be found. The information is necessary because several statements made in this review aim to determine the microbial diversity of arthropods in the Asia. Another area of concern regarding the research gap is the area of the biological processes mentioned in the reviews. The issues within these processes failed to show the roles and function of specified bacteria that interact with the physiology of arthropods. The concern is extensive with those areas vital for an organism to live and shape its capacities for interacting with the environment. Besides, the questions that come to mind are "how bacterial diversity among arthropods influences the biological processes of arthropods and what different types of bacteria found on each species' examined?" Unfortunately, the reviewed article does not thoroughly dive into that issue at all. Moreover, there is insufficient information in the literature review to consider as this appears a prodigious gap in what one must believe when the source for this information gave support for claims that biological processes among arthropods must occur.

Finally, most of the articles reviewed turn out quietly incomplete in details. The problem cascades effects but does not discuss sufficient detachments on how this term fits into the previous information gathered. Again, the article lacks a natural flow in presenting the problems. In connection, one is nearly unable to determine the specific aim for the study if the contrivance were too broad in their scopes and lack any depth. So, the reviewers left too many unanswered questions and many wide-ranging gaps in the literature review to offer any outstanding information to support the need for this study on bacterial diversity in Asia and the pacific arthropods.

Data Checking

Prior to statistical analysis and final revisions, we ensure that we avoid expected human errors and biases by assigning different steps like "data extraction" which includes the inclusion and exclusion of

articles, necessary strategies, step-by-step analysis, charts and graphs, and final validation processes. Also, to guarantee that we have enough articles for conducting this systematic review, we operate a division of work from data mining of research papers (its subparts and point writings) to individual research methods. Moreover, we weighed every 100 articles one by one from the ones we rejected to meet the criteria that we are targeting. This step helps us measure our worth in conducting this systematic review that if we ignore, it will turn out infirm and incoherent. Furthermore, we explore bacterial contamination of different species in various fields in the Asia Pacific. By stating the final criteria of this review, we then followed the rules that have decided for research, and these include; studies that circulate only on the bacterial diversity in marine or terrestrial arthropods, the existence of species in the Asia and the Pacific, whether it was peer-reviewed or not, and articles that published within years 2015 to 2021.
Statistical Analysis

For about 100 articles gathered, 3 articles come from 2015, 7 in 2016, 11 in 2017, 15 in 2018, 20 in 2019, 29 in 2020, and 15 in 2021 (Fig 1). China received the most studies, with 48 publications, out of 16 nations in Asia and the Pacific. Followed by 13 articles in India, 7 in the Philippines, 5 in Malaysia, 4 in Indonesia, Taiwan, and Thailand, 3 in Japan and South Korea, 2 in Hong Kong and Vietnam, and 1 in Bangladesh, Israel, Pakistan, Saudi Arabia, and Singapore (Fig.2).

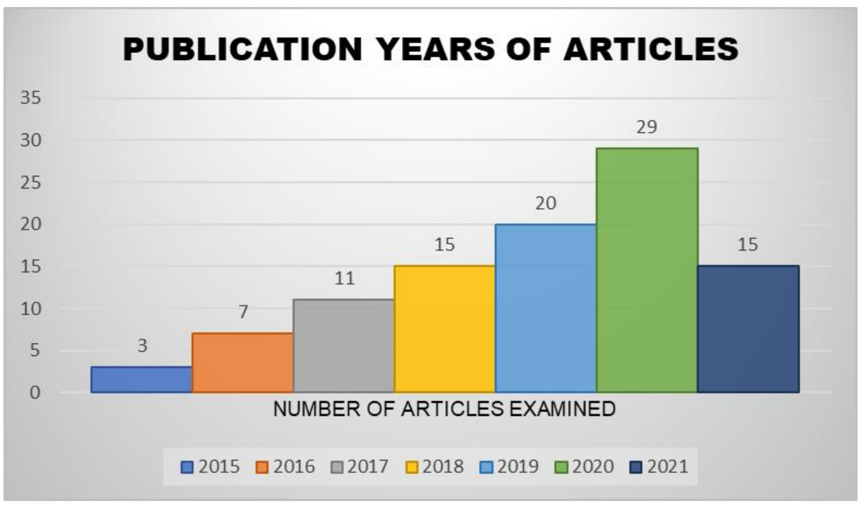


Fig. 1. Column Graph between the Publication Year of the Articles

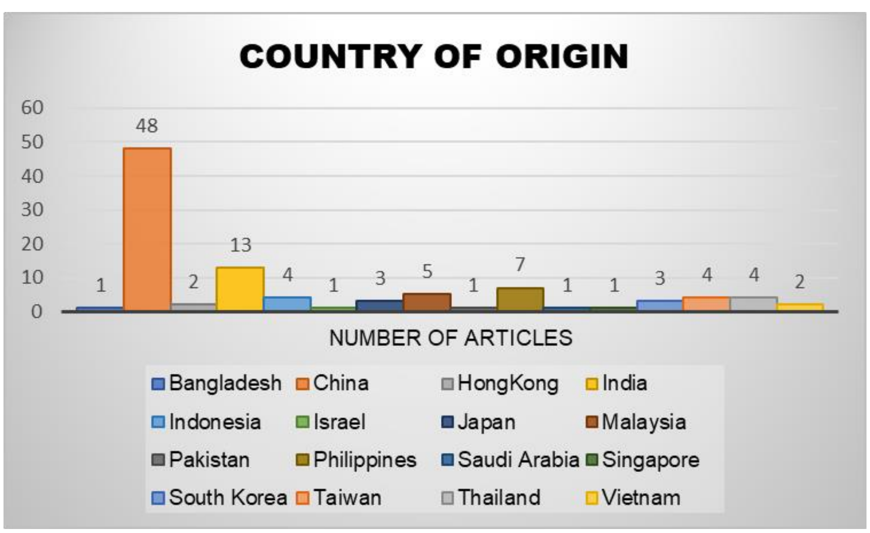


Fig. 2. Column Graph between the Country of Origin

CLASSES UNDER PHYLUM ARTHROPODA	ORDERS UNDER CLASSES	SPECIES
CLASS INSECTA	ORDER LEPIDOPTERA	*Apamea kumaso*
		Ariadne merione
		Bombyx mori
		Carposina sasakii
		Crysiptya cocleasalis
		Danaus chrysippus
		Ectropis obliqua
		Ectropis grisescens
		Elymnias caudata
		Erionota torus
		Eurema blanda
		Gangara thyrsis
		Grapholita molesta
		Heliconius erato
		Helicoverpa armigera
		Idea leuconoe
		Jamides celeno
		Lampides boeticus
		Leptosia nina
		Leptotes pliniusa
		Loxostege sticticalis
		Menelaides deiphobus rumanzovia
		Mythimna separata chitinase
		Papilio demoleus
		Papilio polytes
		Pieris brassicae
		Pieris canidia
		Plutella xylostella
		Pseudozizeeria maha
		Pyralis farinalis
		Scirpophaga incertulas
		Spalgis epius
		Sinibotys evenoralis Walker
		Spodoptera litura
		Troides rhadamantus
		Zizina otis
	ORDER DIPTERA	*Aedes aegypti*
		Aedes albopictus
		Anopheles dirus
		Anopheles jeyporiensis
		Anopheles maculatus
		Anopheles minimus
		Anopheles pampanai
		Anopheles rampage
		Anopheles sawadwongporni
		Anopheles scaloni
		Anopheles stephensi
		Bactrocera cacuminata
		Bactrocera cucurbitae
		Bactrocera dorsalis
		Bactrocera minax
		Bactrocera tau
		Chrysomya megacephala
		Culex pipiens
		Culex quinquefasciatus
		Culex spp.
		Drosophila mojavensis

		Mansonia spp.
		Musca domestica
		Orseolia oryzae
		Zeugodacus cucurbitae
	ORDER HYMENOPTERA	*Apis cerana*
		Apis florea
		Apis mellifera
		Apis nigrocincta
		Colobopsis leonardi
		Dolichoderus thoracicus
		Heterotrigona itama
		Myrmicaria sp.
		Nasonia vitripennis
		Oecophylla smaragdina
		Paratrigona subnuda
		Polyrhachis mindanaensis
		Polyrhachis semiinermis
		Vespa mandarinia
		Vespa simillima
		Vespa velutina nigrithorax
	ORDER OTHOPTERA	*Capnogryllacris spinosa*
		Ceraris nigricornis
		Diestramima beybienkoi
		Diestramima excavata
		Duolandrevus dendrophilus
		Gampsocleis gratiosa
		Gryllotalpa orientalis
		Hexacentrus japonicus
		Mecopoda nipponensis
		Ocellarnaca emeiensis
		Phyllomimus sinicus
		Rhaphidophora incilis
		Tegra novaehollandiae viridinotata
	ORDER COLEOPTERA	*Coccinella septempunctata*
		Cyrtotrachelus thompsoni
		Cyrtotrachelus buqueti
		Dendroctonus valens
		Harmonia axyridis
		Monochamus alternatus
		Monochamus saltuarius
		Melanotus cribricollis
		Oryctes rhinoceros
		Propylea japonica
		Rhynchophorus ferrugineus Olivier
		Tribolium castaneum
	ORDER HEMIPTERA	*Adelphocoris suturalis*
		Amrasca biguttula biguttula
		Aspidiotus rigidus Reyne
		Aspidiotus destructor Signoret
		Bemisia tabaci
		Hippotiscus dorsalis
		Nilaparvata lugens
		Psammotettix alienus
		Pseudoregma bambucicola
		Riptortus pedestris
	ORDER BLATTODEA	*Coptotermes gestroi*
		Coptotermes heimi
		Coptotermes formosanus
		Macrotermes gilvus

		Microcerotermes parvus
		Nasutitermes corniger
		Nasutitermes lujae
		Termes hospes
	ORDER ODONATA	*Brachythemis contaminata*
		Coenagrionidae
		Orthetrum sabina
		Pantala flavescens
	ORDER TRICHOPTERA	*Stenopsyche tienmushanensis*
CLASS ARACHNIDA	ORDER TROMBIDIFORMES	*Ascoshoengastia indica*
		Leptotrombidium imphalum
		Leptotrombidium deliense
		Panonychus citri
		Tetranychus kanzawai
		Tetranychus ludeni
		Tetranychus phaselus
		Tetranychus truncatus
		Tetranychus urticae
	ORDER ARANEAE	*Dictis striatipes*
		Hylyphantes graminicola
		Pardosa astrigera
		Pardosa laura
	ORDER IXODIDA	*Haemaphysalis longicornis*
		Rhipicephalus sanguineus
	ORDER XIPHOSURA	*Carcinoscorpius rotundicauda*
		Tachypleus tridentatus
CLASS MALACOSTRACA	ORDER DECAPODA	*Eriocheir sinensis*
		Litopenaeus vannamei
		Macrobrachium nipponense
		Macrobrachium rosenbergii
		Panulirus ornatus
		Penaeus monodon
		Procambarus clarkii
		Scylla paramamosain
		Scylla serrata Fab
CLASS MALACOSTRACA	ORDER SPIROBOLIDA	*Nedyopus dawydoffiae*
		Trigoniulus corrallinus
	ORDER POLYDESMIDA	*Helicorthomorpha holstii*
CLASS CHILOPODA	ORDER SCOLOPENDROMORPHA	*Scolopendra subspinipes*

Table 1. List of Species under Phylum Arthropoda

A total of 155 species from Phylum Arthropoda were examined in the study (Fig. 3). The dominant class comes from Class Insecta that has 125 species which compromises orders, 29% Ledidoptera, 20% Diptera, 13% Hymenoptera, 10% Coleoptera, 10% Orthoptera, 8% Hemiptera, 6% Blattodea, 3% Odonata, and 1% Trichoptera (Fig. 4). Followed by the Class Arachnida with 17 species with orders, 53% Tromibidiformes, 23% Araneae, 12% Ixoxida, and 12% Xiphosura (Fig. 5). Class Malacostraca with 9 species which compromises 100% order Decapoda (Fig. 6). Class Diplopoda with 3 species with orders 75% Spirobolida, and 25% Polydesmida (Fig. 7). Class Chilopoda has 1 species in 100% Order Chilopoda (Fig. 8).

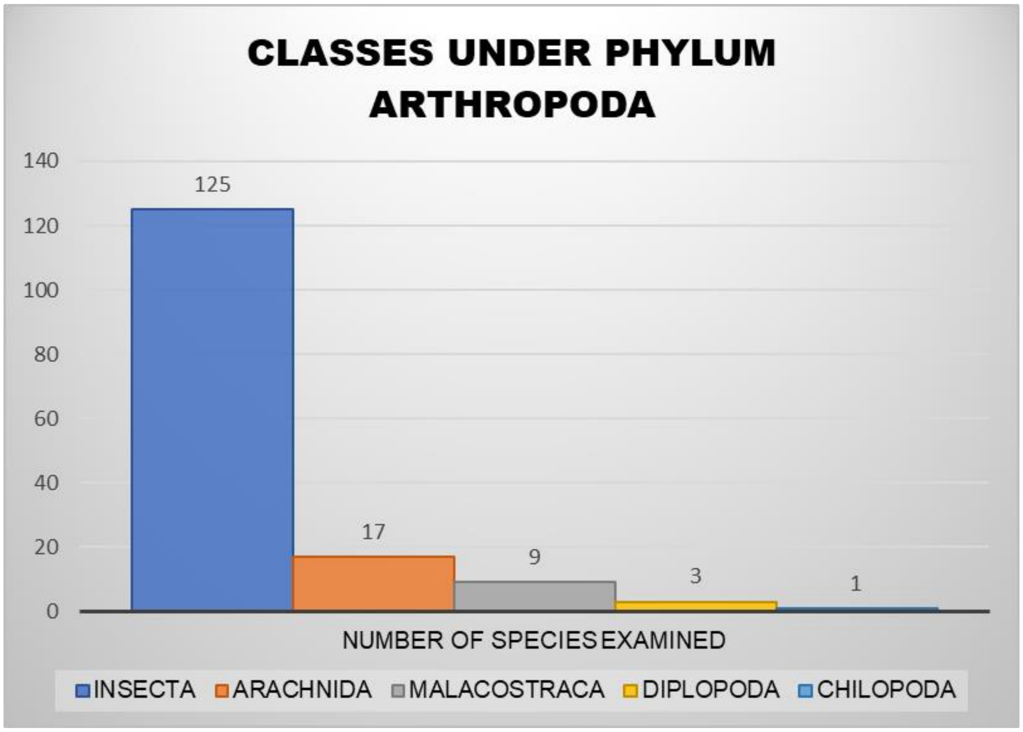


Fig. 3. Column Graph between Classes under Phylum Arthropoda

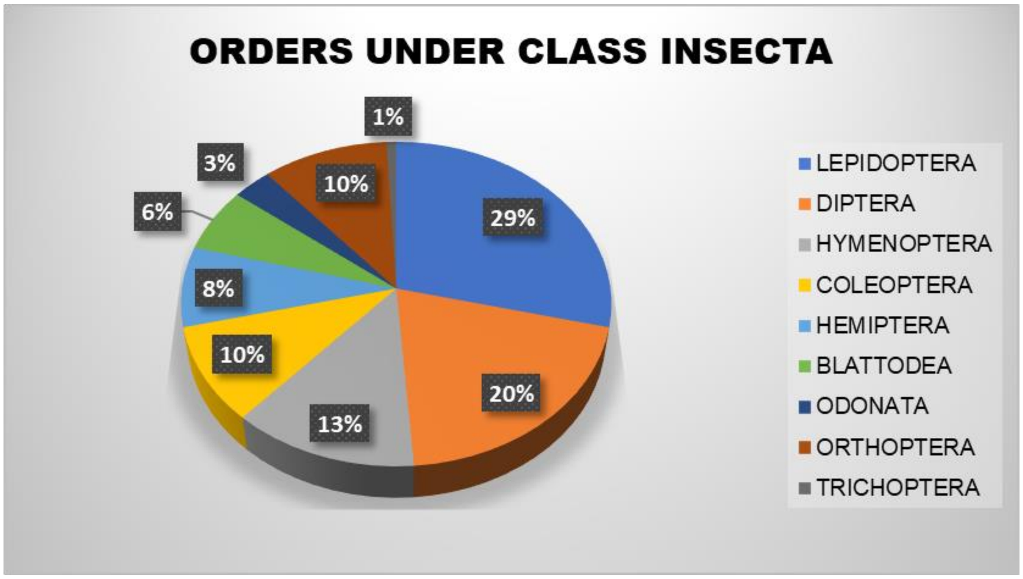


Fig. 4. Pie Chart of Orders under Class Insecta

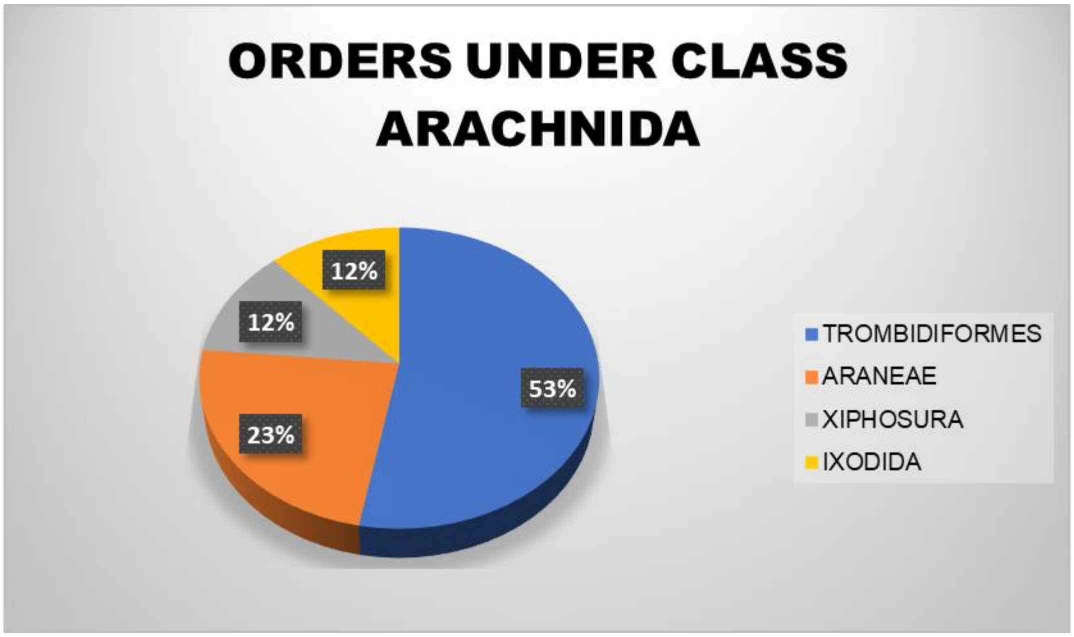


Fig. 5. Pie Chart of Orders under Class Arachnida

Fig. 6. Pie Chart of Orders under Class Malacostraca

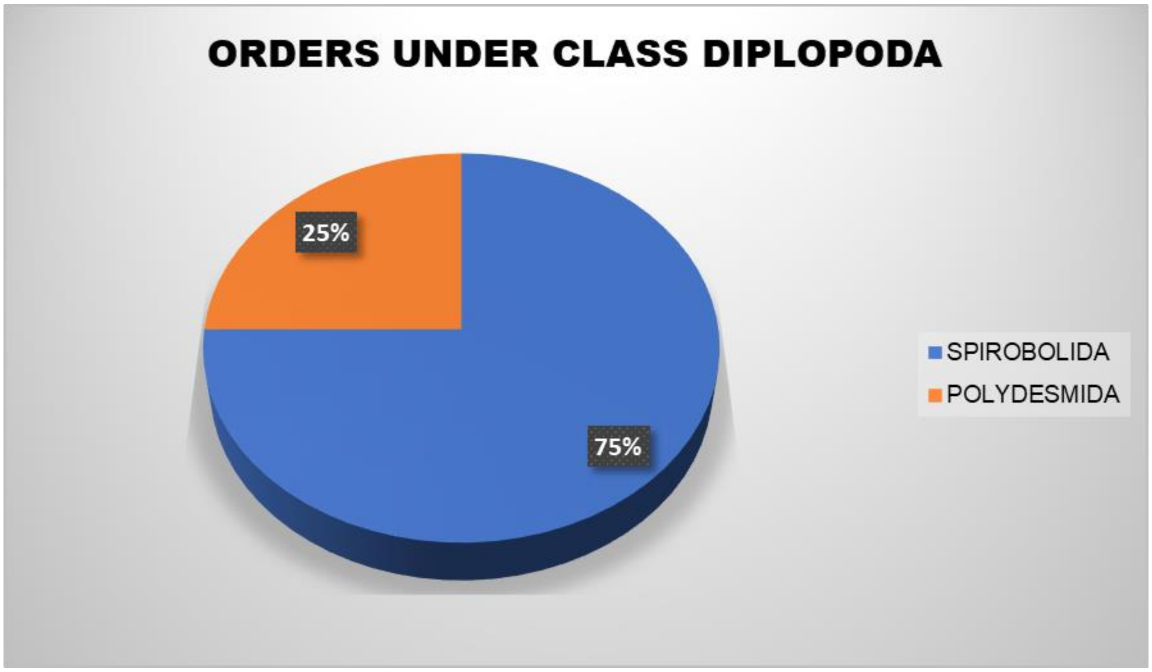


Fig. 7. Pie Chart of Orders under Class Diplopoda

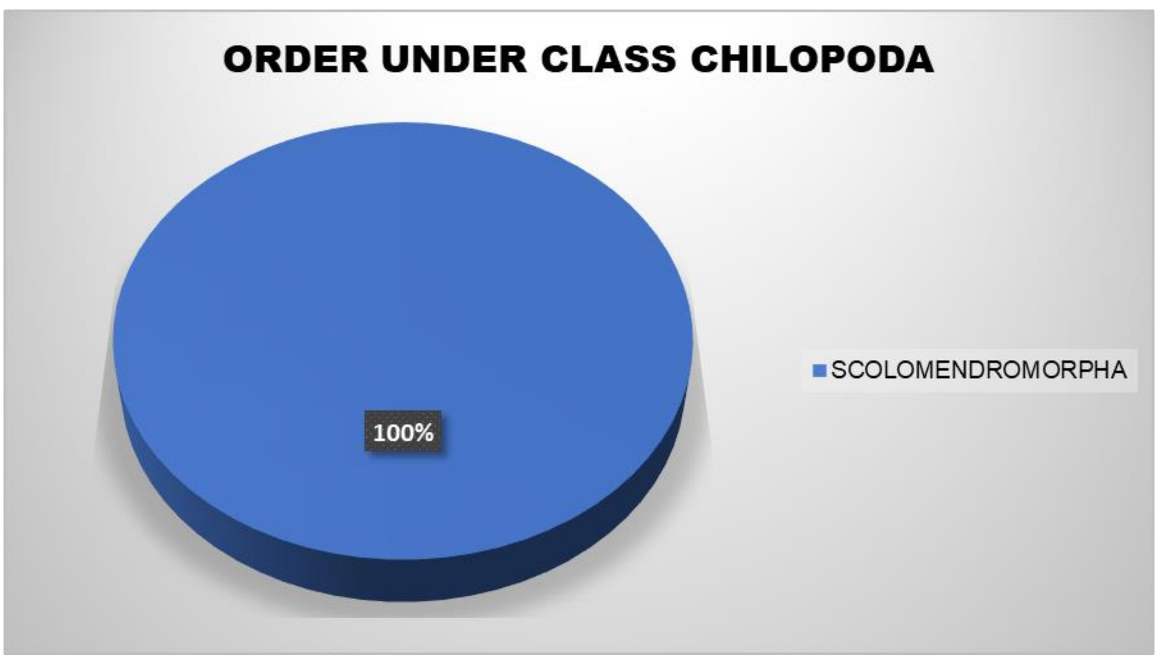


Fig. 8. Pie Chart of Orders under Class Chilopoda

A total of 106 reads obtained in 2 methods of identification in our study which include 52 from 16s rRNA gene sequencing, and 54 from next generation sequencing such as Illumina Miseq platform and pyrosequencing (Fig. 9). The bacterial taxa were obtained from 79 gut samples, 11 from larvae, 6 from the body, 2 from gills, 1 from hepatopancreas, from each life stages such as 6 from adult stage, 5 from eggs, 2 from nymph, 1 each for carapace, pupae, deutonymph, haemolymph, pupae, and protonymph (Fig. 10-11).

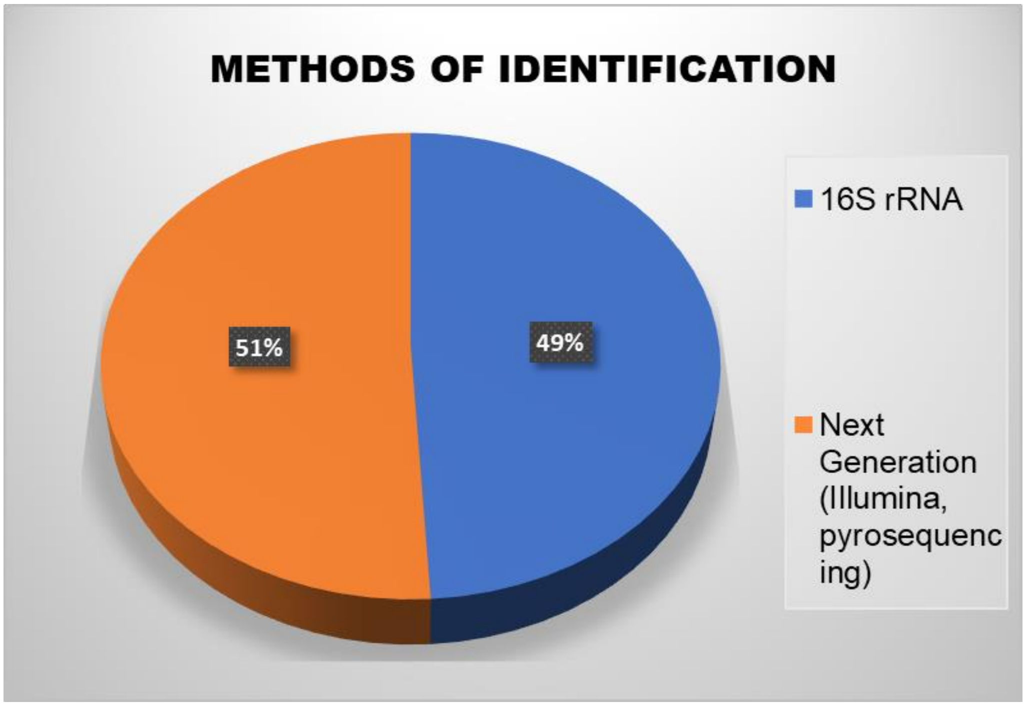


Fig. 9. Column Graph between Methods of Identification

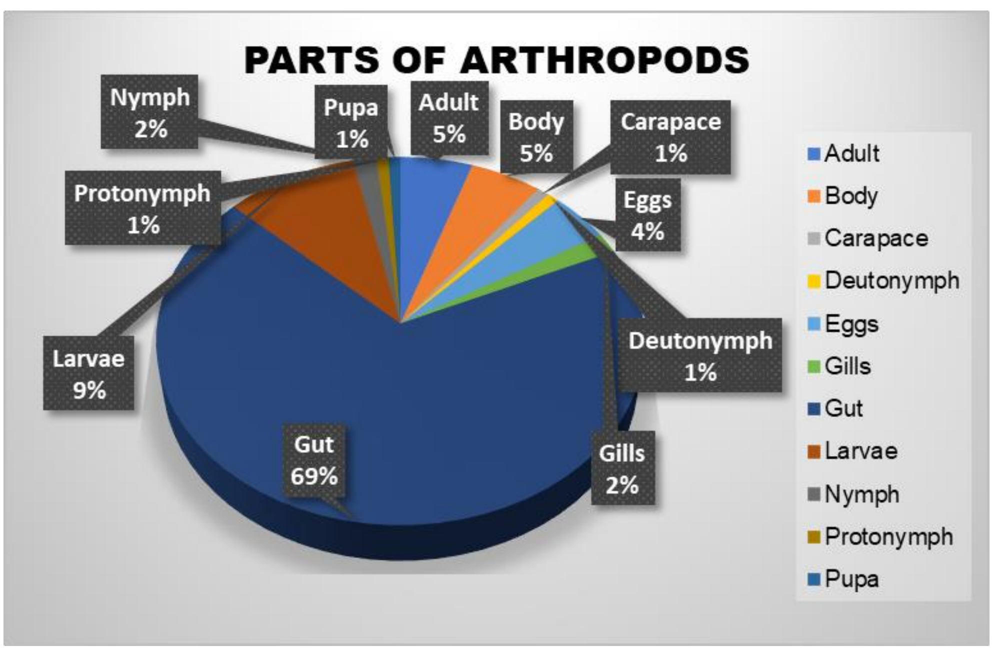


Fig. 10. Pie Graph between Parts of Arthropods

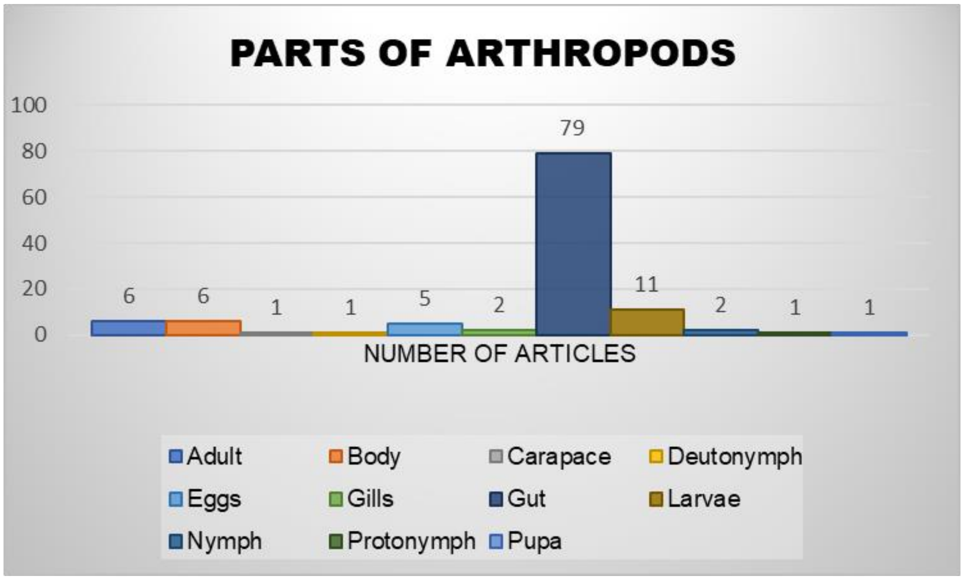


Fig 11. Column Graph between Parts of Arthropods

The overall composition of bacterial diversity in arthropods consisted mainly by Proteobacteria, Firmicutes, Actinobacteria, Bacteroidetes, Cyanobacteria Tenericutes, and Fusobacteria (Fig. 12-13). The most dominant bacterial phylum is Phylum Proteobacteria that has 704 number of bacteria examined that contains 61% from Class Gammaproteobacteria, 25% from Class Alphaproteobacteria, 12% from Class Betaproteobacteria, 1% from Class Deltaproteobacteria, and 1% from Class Epsilonproteobacteria (Fig. 14). Followed by the Phylum Firmicutes that have 268 bacteria examined comes from 87% Class Bacilli, and 12% Class Clostridia, and 1% Class Erysipelotrichia (Fig. 15). Phylum Actinobacteria have 122 bacteria examined from 98% Class Actinobacteria, and 2% Acidimicrobiia (Fig.16). Phylum Bacteroidetes have 78 bacteria examined from 41% Class Flavobacteriia, 37% Class Sphingobacteria,16% Class Bacteroidia, and 6% Class Chitinophagia (Fig. 17). Phylum Cyanobacteria have 34 bacteria examined and accumulated 100% (Fig. 18). Phylum Tenericutes have 33 bacteria examined from 100% Class Mollicutes (Fig. 19). Lastly, Phylum Fusobacteria have 24 bacteria examined from 100% Class Fusobacteria (Fig. 20).

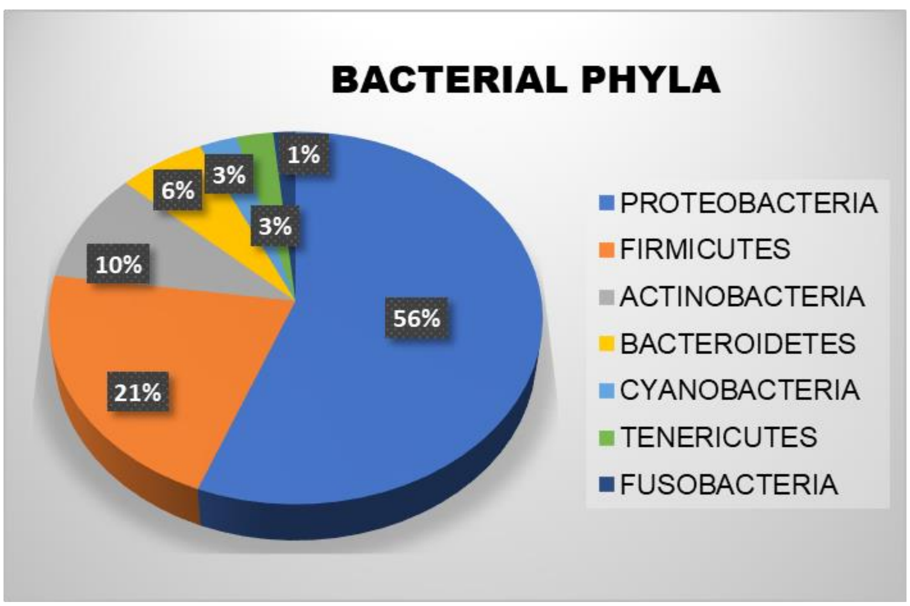


Fig. 12. Pie Chart of Bacterial Phylum

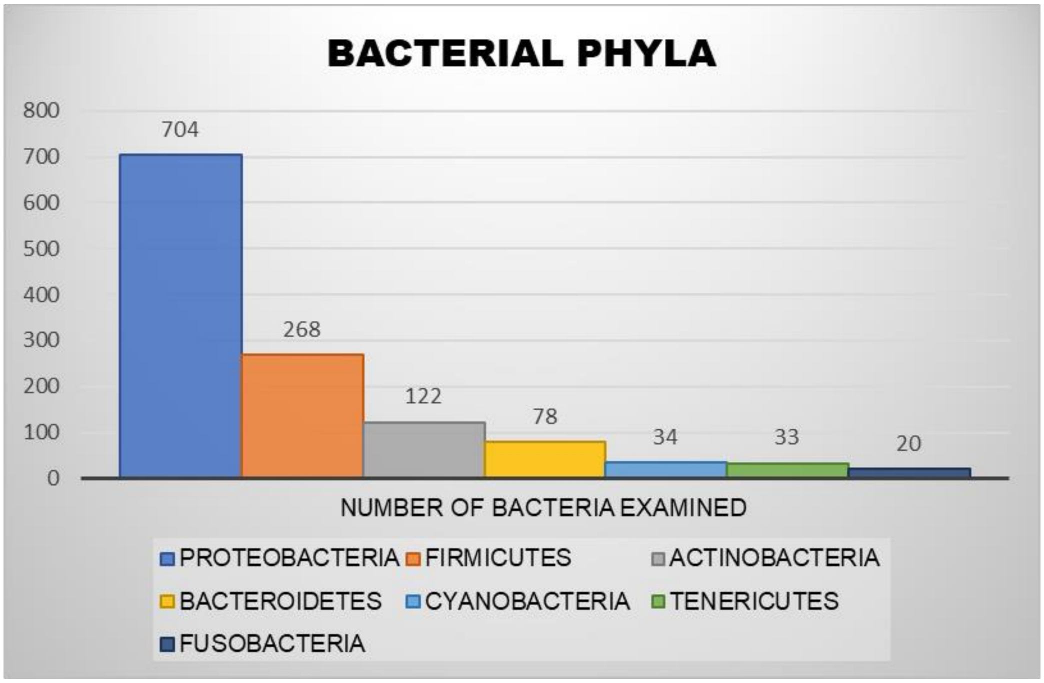


Fig.13. Column Graph of Bacterial Phylum

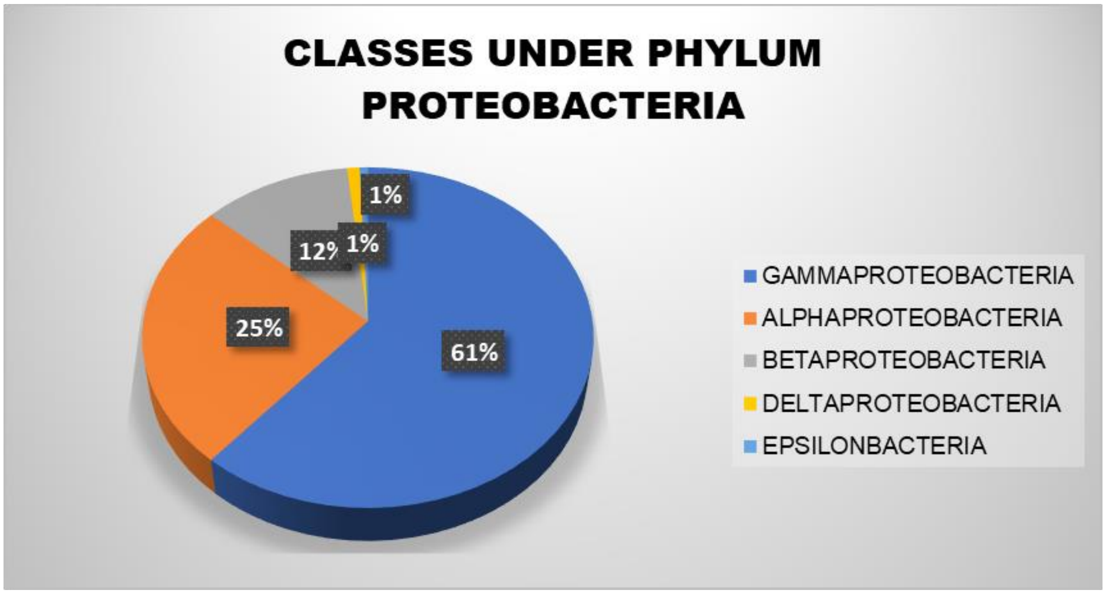


Fig. 14. Pie Chart of Classes under Phylum Proteobacteria

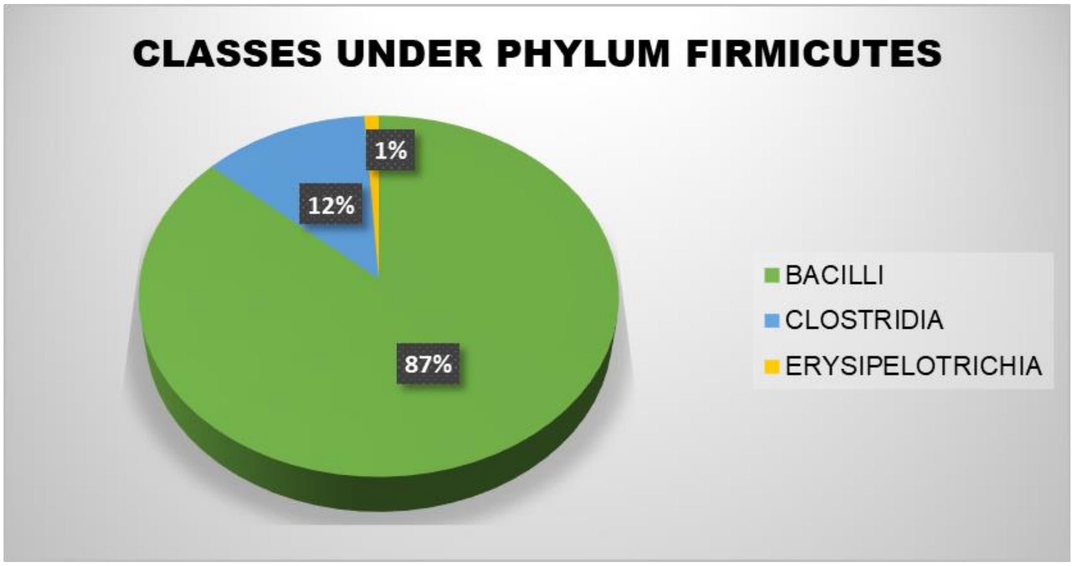


Fig. 15. Pie Chart of Classes under Phylum Firmicutes

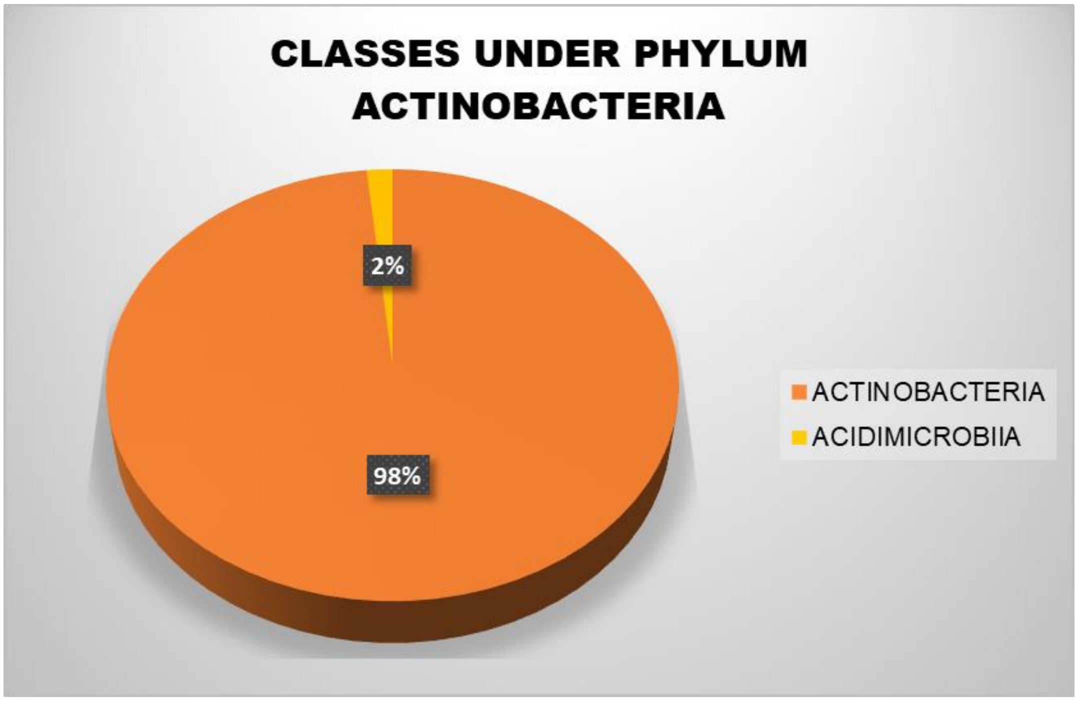


Fig. 16. Pie Chart of Classes under Phylum Actinobacteria

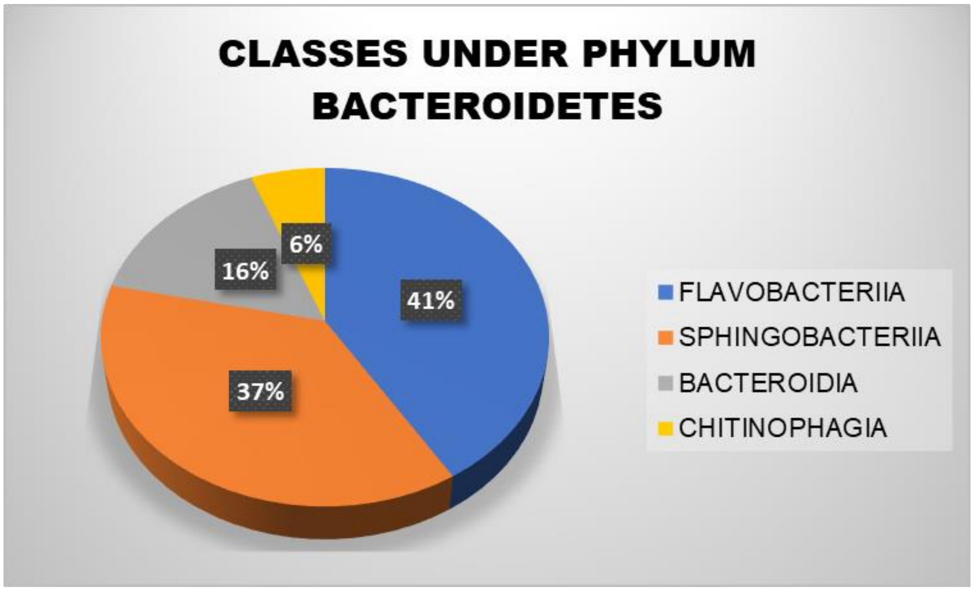


Fig. 17. Pie Chart of Classes under Phylum Bacteroidetes

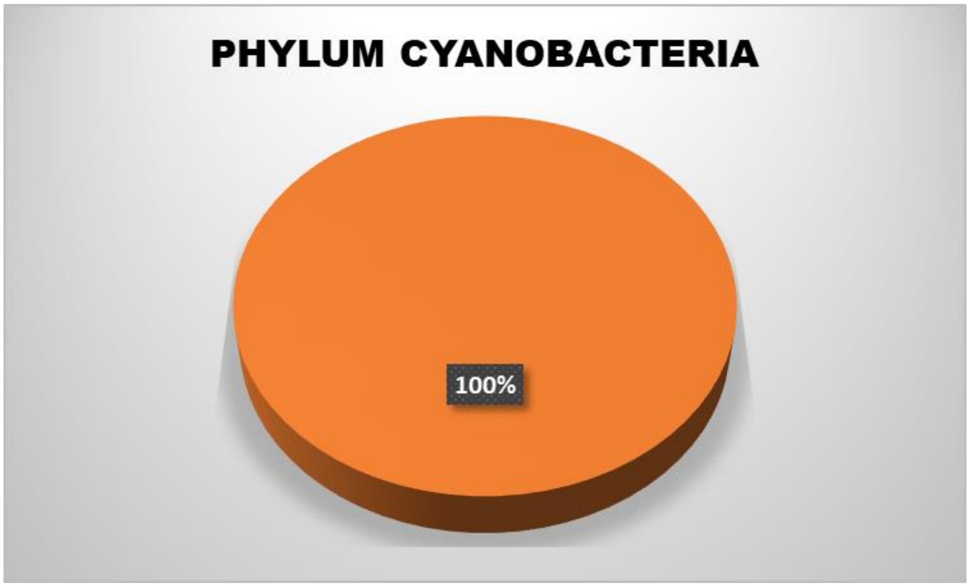


Fig. 18. Pie Chart of Phylum Cyanobacteria

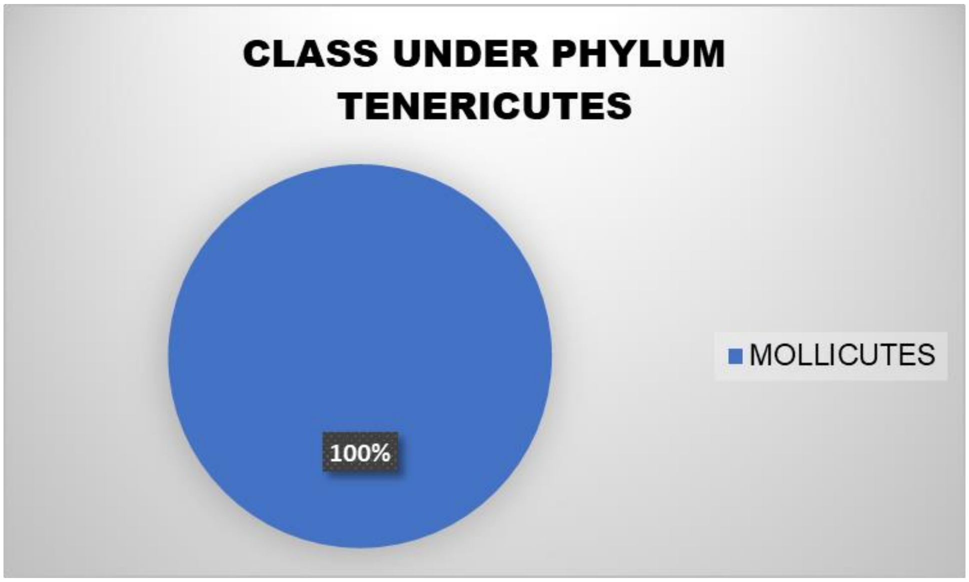


Fig. 19. Pie Chart of Class under Phylum Tenericutes

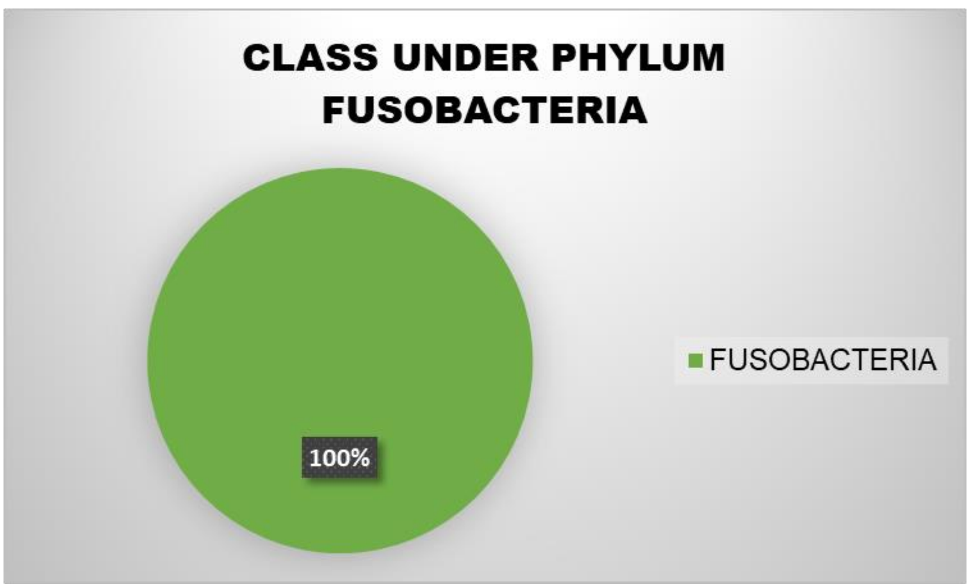


Fig. 20. Pie Chart of Classes under Phylum Fusobacteria

Search Databases, import all Results to a Library, and Exporting to an Excel Sheet

In this systematic review, there are several databases explored and among the 100 articles reviewed, 8 databases are most commonly used. These 8 databases include NCBI (National Center for Biotechnology Information), BioMed Central, Hindawi Journals, Research Gate, ScienceDirect, PLOS (Public Library of Science), PubMed and Google Scholar; all of which help to cover almost all published articles in the microbial diversity of Asia and the Pacific arthropods. After all articles, which underwent the selection process, are selected and gathered, the data mining process begins. In an Excel file, essential information from the articles is exported and gathered. The column headers of the Excel file include: the number assigned to the article, the APA citation and the title of the article, the scientific and the common name of the arthropods, the bacterial communities found in their bodies, the part of the body examined, the method of identification, country of origin, analysis and notes. All of this information is significant in this systematic review which is all about understanding the microbial diversity of Asia and the Pacific arthropods.

Results and Discussions

There are more than 170 articles gathered, but not all of them passed the inclusion criteria set. About 70 articles were rejected for various reasons, although they are related to the systematic review topic and in line with the microbiome of certain species of arthropods. One of the reasons include the publication dates of these articles from 2015 to 2021. Some are review papers, and some information is needed; some include viral and fungal microbial diversity. Lastly, the arthropods species don't have geographic distribution in the Asia-Pacific region and are only native to other countries. However, 100 articles passed the selection criteria and were used in the data mining process of this systematic review. In the 100 articles reviewed, there are 155 unique species from phylum Arthropoda examined to know the bacterial communities in the different parts of their body such as the gut.

Phylum Proteobacteria is one of the most abundant bacterial phyla within the bacteria domain. 56% of the bacteria examined in Asia and the Pacific arthropods belong to these phyla, making it the most dominant bacterial phylum found in the microbiota of these species. By consuming oxygen and reducing the redox potential in the gut environment, the high abundance of Proteobacteria has been attributed to the role of preparing the gut for colonization by the stringent anaerobes required for proper gut function (Shin et al., 2015). Aside from that, this phylum includes a variety of some well-known opportunistic pathogens like Escherichia, Salmonella, Helicobacter and Vibrio which may have an influence on the host's and even the host's owner's health. It is followed by Firmicutes (21%), which plays a significant role in the growth and development, metabolism, essential nutrient allocations, immunity and gut homeostasis. Bacilli, one of the classes under phylum Firmicutes, plays a significant role in producing host of enzymes, antibiotics, and other metabolites. It is known to be a probiotic potential. Lactococcus lacti germfree red palm weevil larvae to get a higher protein, glucose, and lipid content in their hemolymph. It has been well established that insect gut bacteria, Bacilli, may be influenced by parameters such as developmental stage, diet, and environmental factors to hydrolyze cellulose and hemicelluloses, degrade polysaccharides, and modulate RPW nutrition metabolism. (Liu et al., 2021). Phylum Actinobacteria garnered 10% in the overall composition and this phylum is widely spread in both terrestrial and aquatic habitats, mainly in soil. They serve an essential role in recycling refractory biomaterials by digesting complex polymers in dead plants and fungal animal materials. They are regarded as biotechnologically beneficial bacteria that are used for the manufacture of secondary metabolites. Phylum Bacteroidetes accumulated 6% and in insects such as bamboo weevil, Cyrtotrachelus buqueti, that produces enzymes from the anal droplets, these bacterial phylum plays a significant role. Bamboo-feeding insects may adapt to a highly specialized, fiber-rich diet due to the presence of cellulolytic bacterial communities in their gut microbiome. In Bactrocera tau or pumpkin fly, Flavobacteria, a class from Phylum Bacteroidetes inhabits the fly's gut and contributes to the host's nutrition, development, physiology, and resistance to infections and pesticides. In addition, the insecticidal capacity of entomopathogenic gut bacteria can be involved in managing pests in the field. The gut microbiome in B. Dorsalis may secrete enzymes that facilitate the digestion of polysaccharides including xylan, pectin, cellulose, and starch. (Raza et al., 2020). Bacteroidetes was followed by phylum Cyanobacteria (3%), Tenericutes (3%) and lastly, Fusobacteria (1%) in the seven most dominant bacterial phyla in species under Phylum Arthropoda in Asia and the Pacific region.

The bacterial communities and their diversity affect the organism in different ways, and it tells us a lot about the organism as a whole. For instance, in Heliconius butterflies, the differences in beta diversity indicate that the dominant microbiota is preserved between the sexes. (Papa, R. et al., 2018). The bacterial communities between male and female species have a significant difference from one another. Also, the variation in the diet of the species results in varying bacterial communities in their bodies. Diverse factors can alter the bacterial composition and abundance of certain Heliconius butterfly groups. Dietary factors may be significant in affecting the gut microbiota of butterflies (Papa, R. et al. 2018).

Also, bacterial communities come in a unique variety in different stages of arthropods. According to Shukla, the differences between gut microbiota in the dung beetle in its larvae and adult stages for nutrient absorption from digested dung may be recognized at various stages of maturation. (Shukla, 2016). It is the same with the result of Mente et al. experiment. According to them, the bacterial community living in its gut affects the host's physiology. The Macrobrachium rosenbergii, freshwater prawn, during its four-molt cycle, bacterial community increases from stage one to three. The third stage of the molting process is where the microorganisms engaged in fermentation and food material processing are increasingly prevalent. (Mente, 2016) The developmental stages of Bactrocera carambolae are associated with its bacterial communities. During the study, they saw a variation in the bacterial composition among the organism's developmental stage. Their results contribute to bacterial propagation of OTUs from immatures to newly occurring adults, including from exuviae to the environment. (Yong, 2017). Besides, praying mantids, mainly the Tenodera sinensis, Tenodera angustipennis, and Hierodula venosa, have a distinctive gut microbiota associated with the host that distinguishes from prey's gut microbiota in phylogenetic profile. It is dominated by descents that are unique or unusual in other insects. (Tinker, K. et al., 2018).

Aside from sex, diet, and the developmental stages of these arthropods, the bacterial communities and their diversity were also affected by the organism's lives environment. For instance, in arboreal ants, Dolichoderus thoracicus and Myrmicaria sp. and carpenter ants, Colobopsis Leonardi, Polyrhachis mindanaensis, and Polyrhachis semiinermis, their colonies can be found in rotten logs, canopy branches, tree hollows, and nesting in the ground. Arboreal ants contain unique microbiome profiles compared to carpenter ants because it is attributed to the host specificity of the microbial symbionts. Dolichoderus thoracicus consumes a plant-based diet and may be linked to the abundance of Rhizobiaceae (Hu, Y. et al. 2018).

Lastly, it is also important to note that external factors such as the environment and diet influence the diversity of these bacterial communities in arthropods, and they can also be inherited or passed down from mother to offspring. A study in dung beetle or Copris incertus gut microbiota provides strong evidence that bacterial diversity and metabolic functions are transmitted between mothers and their offspring. Maternal care in C. incertus has a substantial impact on the bacterial composition in the initial, intermediate, and offspring stages (Desgarennes et al., 2020). Similarly, animal symbionts can be passed to offspring through a variety of mechanisms, each with different levels of transmission reliability. While endosymbionts in strict animals are usually transmitted vertically through eggs, other mechanisms include an environmental dimension that can effectively transmit bacteria throughout generations. (Rozen et al., 2017).

Evidence shows that bacterial communities and their diversity can be influenced by the specific characteristics or lifestyle of the host, such as their sex, diet, environment, and developmental stages. However, it is also important to note that these bacterial communities also affect the hosts' biological processes and the roles they perform. For instance, the bacteria found in ants play an important function in the diet, nutrition, and health. It revealed that a high-efficient nitrogen economy could recycle nitrogen to synthesize essential amino acids and arginine metabolism to synthesize urea and utilization different carbon sources (Gatpatan, M. et al. 2021). In soil invertebrates such as Trigoniulus corallinus, Cubaris murina, and Pycnoscelus surinamensis, microbes act as soil filters, attributing in regulating of nutrient and carbon cycles. These bacteria are biogeochemical cycle mediators, such as the plant's carbon cycle, residual biomass decomposition, and nitrogen fixation (Da Silva-Correia et al., 2018). One article shows how microbiota evolves during its ontogenetic development and assesses functional adjustments in metabolic pathways. It demonstrates the abundance and variety of bacteria differ during Penaeus monodon developmental stages. The study results show that each ontogenetic stage provides specific circumstances for certain bacterial taxa to flourish. (Cicala, et al. 2020).

Another is that microbiomes affect the metabolism and survival of organisms. Bacterial communities that inhabit the digestive system of insects play an important role in its host's health. In one of the articles, the honeybee is a social insect with a microbiome community mainly limited to the gut. This microbiota is dynamic and adaptive due to several factors, such as honeybees' age, social interactions, nutrition, and the hive environment. The Bacillus abundance in Apis dorsata gut secreted enzymes contain probiotic potential and are involved in the bee feed metabolization. Lysinibacillus sphaericus protect the host's gut and digest nutrients (Niode, N. J., et al., 2021). In barnacles, the cirri and gut microbiome of Semibalanus balanoides have unique predictive metabolic pathways. It gives intuition about the roles of suspension feeders in the foreshore. S. balanoides feeds on phytoplankton such as diatoms. Their gut microbiome contains lots of nutrient extraction functions such as xylose, glucose, sucrose degradation, and pyruvate fermentation which has access to a rich carbon source (Brown, B. et al. 2020).

In termites, their gut microbiome influences their ability in producing targeted products and degrading wheat straw. The bioreactors inoculated with the N. ephratae gut microbiome are accompanied by high xylanase and cellulase activities. They obtained the highest level of wheat straw conversion (Auer et al., 2017). The inferred eco-physiological role of the N. ephratae can also originate from other aquatic animals' gut environments and relate to food material processing. For instance, in prawns, the gut microbiota activities and structure, even the effects on the host, help maintain microbial equilibrium with the surrounding environment and supporting intestinal microbial colonies (Hammer et al., 2016). In terrestrial isopods, the microbiome is essential in mediating their functional role—for instance, regulators of nutrient cycling and key decomposers of organic matter in soil ecosystems. Therefore, when changes in the microbiota lead to differences in host's function (in terms of nutrition, health, and reproduction), they may eventually obstruct isopods' regulating function in terrestrial ecosystems. (Buochon, et al., 2016).

Other microbiomes serve as a defense mechanism to arthropods. They used their bodies protected by a polysaccharide, nitrogen groups, and a rigid cuticle. It is made of chitin and proteins that act as an exoskeleton. A fast escape by fleeing or flying is the principal means of protection for many insects. The abundance of Actinobacteria in the microbiome of Nedyopus dawydoffiae's digestive tract are major producers of antibiotic substances against Gram-positive bacteria and fungi, and it includes methicillin-resistant strain Staphylococcus aureus. The antibiotics for actinobacterial producers' function may vary. The millipede's gut microbiome can function like a chemical weapon in interspecific struggle and we have to take note that the more complex the microbiome is, the more diverse its microorganism's spectrum of antibiotic activity will be. In addition, microorganisms of the same species can differ in terms of the range of antibiotics (Glukhova, A. et al., 2018).

The function of gut bacteria also contributes to host development, nutrition, physiology, and resistance to some insecticides and pathogens. In the diamondback moth, Plutella xylostella, insecticide resistance is dependent on gut microorganisms. However, the impact on the immune system may be a factor. Insecticide resistance was improved with the help of vitamin C and acetylsalicylic acid. Also, insecticide's common application increases the diversity and type of symbiont bacteria in Plutella xylostella's digestive tract, which contributes to producing enzymes such as esterase and carboxylesterase that degrade the insecticides' active compounds. (Kaur, M. et al. 2021). In addition to preventing pathogenic bacteria from growing, controlling the immune response, impacting nutritional absorption, manufacturing vitamins, regulating metabolic processes, the microbiota plays a vital role in the development and physiology of its host. The function and structure of the microbiome are influenced by probiotics, feed intake, hormone secretion, antibiotics, developmental stage, stress, environmental and physiological conditions, immune response, and host metabolism. (Gallardo-Becerra, L., et al. 2017).

Additionally, dominant bacterial phyla in arthropods play significant roles to their functions, biological processes and other important roles in the environment. Their abundance affects the organisms in several ways. For instance, in Panonychus citri or Citrus Red Mite, there is an abundance of Proteobacteria and it has an effect on the host's lifespan. These bacteria were positively correlated with lipid metabolism pathways, cofactors and vitamin metabolisms. It acts as an essential element in nitrogen fixation, and other metabolisms of nutritional components, insecticide resistance, and protection against parasites. (Zhang, Z, et al. 2020) Actinobacteria dominates the four-molting stage of the Giant freshwater prawn (Macrobrachium rosenbergii). The bacterial diversity adapted to the gut condition of the prawn during each molting stage, affect some processes of the organism like potential metabolic reportoires, potential pathogens, and as a candidate probiotic species. Also, the structure and activity of the gut microbiota and its effect on the host are useful to maintain microbial balance with the surrounding environment (Mente, E., et al. 2016) Lastly, the discrete functional groups of proteobacteria found in the microbiome of scorpions (Scorpionidae sp.) may represent an ancestral core of the terrestrial animals' functional microbiome, eventually expanded by the inclusion of both Gram negative and positive bacteria. These functional groups share metabolic traits of energy conservation that are significant in both the fitness and survival aspects under anaerobic and micro-oxic conditions. Originally, they were present in composting environmental communities from which other organisms such as Azospirillum are likely to have been filtered into animal microbiome. (Degli. et al. 2017)

In summary, bacterial comunities are responsible in playing significant roles in its hosts' growth, health and biological processes. Evidence has shown that these communities and their diversity can be influenced by the specific characteristics or lifestyle of the host, such as their sex, diet, environment, and developmental stages. It is also inherited from parent to offspring. However, it is also important to note that these bacterial communities also affect the hosts' biological processes and the roles they perform. The bacterial community and diversity of bacteria living in arthropods affect their growth, metabolism, digestion, survival and defense mechanisms, physiology, and roles in the environment. Additionally, the dominant bacterial phyla found in the examined arthropods plays a significant role in the host's biological processes and functions. A thorough understanding of how bacterial diversity affects an arthropod and how specific characteristics determine these bacterial communities are essential. They can help expand our current knowledge about arthropods and bacteria.

Conclusion and Recommendations

Microorganism identification is crucial in a variety of domains of microbiology, most notably in the large number of arthropods that serve as markers of various health problems. In this sense, arthropod bacterial diversity differs greatly in terms of distinct properties including nutrition, reproduction, and survival, all of which help reproduction and evolution. In addition, bacterial diversity in arthropods is crucial for any ecosystem in the Asia Pacific. They're essential for improving soil condition, plant development, and yield, and ensuring the ecosystem's long-term viability, and minimizing dependency on chemical fertilizers. Arthropod pollination, honey production, insect consumption, garbage decomposition, and serving food for some animals benefit both humans and arthropods.

This systematic review addresses the diversity of bacteria discovered in Asia and the Pacific, in keeping with the importance of arthropods in the ecosystem. It displays data that specifies the countries of origin, the phylum of arthropods present, the methods used to identify bacteria, the locations of the body where the most bacteria have been discovered, and the impact of the bacterial community and variety on the biological processes of the host, as well as the other way around. Furthermore, the information acquired determines which arthropod orders are most prevalent among the species studied in this systematic review.

Class Insecta is the most data mined class, followed by Arachnida, Malacostraca, Diplopoda, and Chilopoda (see Figure 4-8). Proteobacteria is the most common phylum of bacteria found in data-mined species from Asia and the Pacific. The following bacteria are Firmicutes, Actinobacteria, Bacteriodetes, Cyanobacteria, Tenericutes, and Fusobacteria (see Figure 12). Proteobacteria dominate in the guts by expanding oxygen and reducing the redox capable in the gut environment, the Proteobacteria are believed to play a crucial role in assembling the gut for colonization by the stringent anaerobes essential for optimal gut function (Shin et al., 2015). The species found in every article are located in Asia and the Pacific, the country that has the most studied arthropods are found in the country of China (see Figure 2), and next to it is the country of India. Identifying the communities of bacteria found in an organism during this time are not as hard as before because there are many methods and techniques to perform. In the 100 articles, the most used method of bacterial identification is the next-generation sequencing which includes pyrosequencing and Illumina sequencing platforms (see Figure 9). The second method of identification is not far from the percentage of the next-generation sequencing, it is the 16s rRNA. 16S rRNA gene sequencing is extensively used for identifying, classifying, and quantifying microorganisms in complex biological mixes such as environmental samples and gut samples but because of the high-throughput production and outputs of sequencing data in the Giga base range each instrument run, as well as the reduced cost compared to the classic Sanger first-generation sequencing method, next-generation sequence (NGS) is the method of choice for large-scale genomic and transcriptome sequencing. The intestine is home to the biggest population of bacteria in arthropods, which is known as the gut microbiota. As shown in Figure 10, the gut is the most explored part of an arthropod that contains bacterial communities. The gut microbiota has been proven to aid digestion, detoxification, development, infection resistance, and physiology in the host (Jing et al., 2020).

Overall, the cessation of this systematic review is based on data from 100 articles. Every bacterial diversity found in an arthropod, regardless of whether it originated in the gut or other parts of the organisms' body, affects the organism's biological processes (sex, diet, "growth" or developmental stages, metabolism, defense mechanism), environment, function, and survival.

Acknowledgment

We would like to thank Our Almighty God who comforts us to elongate our patience, broaden our allegiance, and consolidate our commitment to complete this paper. To say, we wouldn't have this courage if we don't embrace this opportunity from Him, we still couldn't believe concluding an academic paper that came from His blessings, and we thank Him a lot for the gift of wisdom He engraved on us. We would like to express our gratitude to our exceptional adviser, Mr. Gary Antonio Lirio who has helped us in providing his views and experience which has helped us in the preparation for this paper. It means a lot for us to have a navigator that leads us in a favorable direction. We would also like to thank our dearest families and friends who allowed us to enter the portals of our ambitions and whole-heartedly gave us guidance and support to achieve our destinations. The views expressed are those of the authors and not necessarily those of the department of education, our adviser, and our families.

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Some Risk Factors Related to Diabetic Retinopathy in Patients with Type 2 Diabetes Mellitus

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Abstract - Along with the rising incidence of diabetes, the prevalence of diabetic retinopathy is quickly growing across the world. The incidence of DR complications is high, with some patients being detected only when there are complications and visual impairment, causing many difficulties for the treatment process. Objectives: The goal of this cross-sectional was to look at the clinical and subclinical features of diabetic retinopathy patients. Diabetic retinopathy was diagnosed using International Clinical Diabetic Retinopathy. Complete clinical information (Age, sex, weight, height, history of hypertension and diabetes mellitus, smoking, alcohol), subclinical information (Glucose, urea, creatinine, HbA1c, uric acid, cholesterol, triglyceride, HDL-cholesterol, LDL-cholesterol blood levels) were collected. The research included 105 type 2 diabetic patients. In which, the rate of patients with diabetic retinopathy is 30.48% (7.6% mild Non-Proliferation Diabetic Retinopathy (NPDR), 17.1% moderate NPDR, 5.7% Severe NPDR). Diabetic retinopathy patients have significantly higher results in age, eGFR, uric acid blood levels than patients without diabetic retinopathy (p=0.013; p=0.037; p=0.008). Over ten years of diabetes mellitus raised the risk of diabetic retinopathy by 13.81 times compared to other individuals. In conclusion, age, eGFR, uric acid blood levels and duration of diabetes mellitus over ten years are risk factors of diabetic retinopathy. Diabetes mellitus for 10 years increased the risk of diabetic retinopathy by 13.81 times when compared to no diabetic retinopathy patients.

Keyword - Diabetes mellitus, Diabetic retinopathy, Risk factors

Introduction

Diabetes mellitus (DM) is a non-communicable disease that is rapidly increasing globally. In 2019, in Southeast Asia, there were 88 million people with diabetes according to the International Diabetes Federation statistics. By 2045, this number will increase by 74% to 153 million diabetic patients. Located in Southeast Asia, Vietnam is also a country with a high prevalence of diabetes with more than 3 million diabetic patients (Federation, 2019) DM has many vascular complications. In particular, diabetic retinopathy (DR) is the most common complication of ocular microvascular disease in diabetes. Blindness and visual impairment caused by DR will increase from 27% in 2020 to 69% in 2030 (Radi RE, 2021).

Currently, there are no large-scale studies on this complication in Vietnam, although studies conducted in some hospitals have also shown the situation of DR. The prevalence of DR in patients with diabetes in Vietnamese publications ranges from 22.4% to 42.5% (Le Viet Phuong, 2019; Vu Thanh Binh, 2021). The incidence of DR complications is high, with some patients being detected only when there are complications and visual impairment, causing many difficulties for the treatment process. Screening and finding out the factors related to this complication are crucial for clinicians. Therefore, we conducted this study to determine the clinical and subclinical features related to DR in patients with type 2 diabetes.

Methodology

Study subjects: Diabetic type 2 patients treated at General Internal Medicine Department - E Central Hospital.

Selection criteria: Patients were diagnosed with type 2 diabetes (According to the American Diabetes Association Guidelines 2020) (Association, 2020) and voluntary participation in the study. Complete clinical information (Age, sex, weight, height, history of hypertension and diabetes mellitus, smoking, alcohol), subclinical information (Glucose, HbA1c, uric acid, cholesterol, triglyceride, HDL-cholesterol, LDL-cholesterol blood levels).

Exclusion criteria: Patient has one of the following cases: type 1 diabetes, gestational diabetes, severe cataract.

Study design: Descriptive, cross-sectional study

Time and location: The study was conducted from May 2020 to April 2021, data were collected from the General Internal Medicine Department - E Hospital.
Patients were examined in general and their eyes. Retinal digital photography (Kowa, VX-20 retinal camera) was performed at the end of the examination after medical dilatation of the pupil.

Blood samples were taken for biochemical tests.

Body mass index (BMI) is calculated by the formula: BMI = $\frac{weight\ (kg)}{height\ (m) \times height\ (m)}$ (Freedman DS, 2013)

Testing techniques: Glucose quantitation: Hexokinase method; Cholesterol, triglyceride, HDL-cholesterol, LDL-cholesterol quantitation: colorimetric enzyme method; Uric acid quantitation: colorimetric photometric method (AU 5800 and c501). HbA1c quantitation: High-performance liquid chromatography method (Premier 9210).

Estimated glomerular filtration rate (eGFR) based on blood creatinine calculated using formula MDRD (Modification of Diet in Renal Disease)
$eGFR_{cre} = 186.3 \times Scr^{-1,154}$ (mg / dL) $\times$ age $^{-0,203}$ $\times$ 0.742 (if female) (A. S. Levey, 2003)
(eGFRcre: Estimated glomerular filtration rate based on Creatinine; Scre: Serum creatinine concentration)

Diabetic retinopathy was diagnosed using International Clinical Diabetic Retinopathy (Ophthalmology, 2017)

Diabetic Retinopathy	**Findings Observable on Dilated Ophthalmoscopy**
No apparent DR	No abnormalities
Mild nonproliferative DR	Microaneurysms only
Moderate nonproliferative DR	Microaneurysms and other signs (e.g., dot and blot hemorrhages, hard exudates, cotton wool spots), but less than severe nonproliferative DR
Severe nonproliferative DR	Moderate nonproliferative DR with any of the following: • Intraretinal hemorrhages (≥20 in each quadrant); • Definite venous beading (in 2 quadrants); • Intraretinal microvascular abnormalities (in 1 quadrant); • and no signs of proliferative retinopathy
Proliferative DR	Severe nonproliferative DR and 1 or more of the following: • Neovascularization • Vitreous/preretinal hemorrhage

Data analysis: Data were analyzed by SPSS 22.0 software (IBM, American). Analysis of variance (ANOVA); Kruskal-Wallis test; Chi-square tests ($\chi 2$), and Pearson correlation were applied to the corresponding cases. p-value of less than 0.05 was considered a statistically significant difference.
Ethics: The study was conducted under the ethical approval of Hanoi Medical University, coding number IRB-VN01.001/IRB00003121/FWA 00004148.

Results and Discussions

Our study was conducted on 105 patients with 51 males and 54 females diagnosed with type 2 diabetes at Hospital E. Age, historical of hypertension, Systolic blood pressure, Diastolic blood pressure, BMI, glucose, HbA1c, ure, cholesterol, triglyceride, LDL_Cholesterol blood level and eGFR of two genders are similar (p>0.05), while creatinine, uric acid, HDL_Cholesterol were significantly different between male and female as shown in table 1.

Table 1. General characteristics of study subjects

No	Charateristiques		All patients	Male	Female	p
1	Age (year)		66.47 ± 8.97	65.69 ± 9.61	67.20 ± 8.35	0.389
2	Historical of hypertension (n, %)	No	33	18 (54.5)	15 (45.5)	0.407
		Yes	72	33 (45.8)	39 (54.2)	
3	Systolic blood pressure (mmHg)		133.19 ± 20.70	133.33 ± 18.40	133.06 ± 22.83	0.946
4	Diastolic blood pressure (mmHg)		77.08 ± 10.87	78.53 ± 9.07	75.70 ± 12.26	0.184
5	BMI (kg/m^2)		23.54 ± 3.03	23.22 ± 2.89	23.84 ± 3.17	0.292
6	Glucose (mmol/L)		9.99 ± 4.54	9.96 ± 3.78	10.02 ± 5.20	0.940
7	HbA1C (%)		10.38 ± 2.87	10.13 ± 2.83	10.62 ± 2.91	0.391
8	Creatinine (µmol/L)		75.31 ± 20.45	84.45 ± 21.44	66.69 ± 15.19	**<0.001**
9	eGFR (mL/minute/1.73m^2)		83.61 ± 23.99	85.56 ± 25.81	81.77 ± 22.23	0.421
10	Uric acid (mmol/L)		332.25 ± 106.82	359.40 ± 112.43	306.67 ± 95.40	**0.012**
11	Cholesterol (mmol/L)		5.11 ± 1.29	4.96 ± 1.43	5.26 ± 1.13	0.234
12	Triglyceride (mmol/L)		2.77 ± 1.85	2.85 ± 2.05	2.70 ± 1.65	0.688
13	HDL_Cholesterol (mmol/L)		1.14 ± 0.28	1.07 ± 0.29	1.21 ± 0.27	**0.011**
14	LDL_Cholesterol (mmol/L)		2.69 ± 0.99	2.54 ± 1.01	2.84 ± 0.96	0.123

Our study was conducted on 105 type 2 diabetic patients, the male: female ratio was 1: 1.06. This ratio is different from other studies. In South Vietnam, research by Minh L.T.K. (2020), male: female ratio is 1: 1.94 (Chau My Chi, 2021). At the hospital in the North of Vietnam, research of Anh V.T. (2021) showed the rate is 1.2: 1 (Vu Tuan Anh, 2021). This disparity might be attributed to differences in population, diet and lifestyle in each location. The mean age of patients in our study was 66.47 ± 8.97 years old. This result showed that the patients in our study are mainly the elderly group, this is also the group of patients with a physiological decline in functions and high risk of many chronic diseases. The age in our study is higher than that of Anh, V.T. (2021) (61.7 ± 9.4 years) (Vu Tuan Anh, 2021). This difference may be because the proportion of elderly patients is higher in this area, leading to a higher average age than many studies in other places. The patients had high mean systolic blood pressure and normal diastolic blood pressure. This result was consistent with the high rate of patients with hypertension in our study (68.6%). In the United Kingdom Prospective Diabetes Study, 38% of newly diagnosed type 2 diabetes patients had hypertension, which increased in the following years (Waris A, 2016). Hypertension is also a risk factor for the progression of diabetic retinopathy.

Glucose blood levels > 9mmol/L and HbA1c levels > 10% showed that most patients did not have good glycemic control. Male patients had higher serum uric acid levels than females (359.40 ± 112.43 mmol/L and 306.67 ± 95.40 mmol/L) with p = 0.012. Many research showed that in diabetic patients, uric acid levels increase more in men than in women with increasing age (Adlija C, 2010). Male patients have considerably greater creatinine concentrations than female patients (p 0.001), although there was no difference in eGFR between the two genders (p=0.421). This is simple to explain since men and women have different weights and muscular mass, resulting in different creatinine levels (Alessandra Calábria Baxmann, 2008). HDL-cholesterol blood levels in women were reported higher than in men throughout their lifetime, similar to our results when we obtained HDL-cholesterol levels in women of 1.07 ± 0.29 mmol/L, while this result for men is 1.21 ± 0.27 mmol/L with p = 0.011 (Gupta R, 2016).

Clinical and subclinical features in two groups of patients: with and without diabetic

In 105 patients, there were 32 diabetic retinopathy patients (about 30.5%). We analyzed clinical and biochemical indicators between 2 groups of patients with and without DR, the results were shown in Table 2 and Figure 1.

Table 2. Some clinical characteristics between patients with and without DR

<table>
<tr><th>No</th><th colspan="2">Charateristiques</th><th>Diabetic patients with DR (n=32)</th><th>Diabetic patients no DR (n=73)</th><th>OR</th><th>CI</th><th>p</th></tr>
<tr><td rowspan="4">1</td><td colspan="2">Age (year)</td><td>69.72 ± 8.43</td><td>65.04 ± 8.88</td><td></td><td></td><td>0.013</td></tr>
<tr><td rowspan="3">Group of age (year) (n, %)</td><td><60</td><td>4 (16.0)</td><td>21 (84.0)</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">0.010</td></tr>
<tr><td>60-70</td><td>10 (23.3)</td><td>33 (76.7)</td></tr>
<tr><td>>70</td><td>18 (48.6)</td><td>19 (51.4)</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Gender</td><td>Male</td><td>12 (23.5)</td><td>39 (76.5)</td><td rowspan="2">0.523</td><td rowspan="2">0.223-1.225</td><td rowspan="2">0.133</td></tr>
<tr><td>Female</td><td>20 (37.0)</td><td>34 (63.0)</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Historical of hypertension (n, %)</td><td>No</td><td>7 (21.2)</td><td>26 (78.8)</td><td rowspan="2">0.506</td><td rowspan="2">0.193-1.329</td><td rowspan="2">0.180</td></tr>
<tr><td>Yes</td><td>25 (34.7)</td><td>47 (65.3)</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Duration of diabetes mellitus (year) (n, %)</td><td><10</td><td>7 (10.8)</td><td>58 (89.2)</td><td rowspan="2">13.810</td><td rowspan="2">5.018-38.003</td><td rowspan="2"><0.001</td></tr>
<tr><td>≥10</td><td>25 (62.5)</td><td>15 (37.5)</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Historical of smoking (n, %)</td><td>No</td><td>29 (30.2)</td><td>67 (69.8)</td><td rowspan="2">0.866</td><td rowspan="2">0.202-3.701</td><td rowspan="2">0.846</td></tr>
<tr><td>Yes</td><td>3 (33.3)</td><td>6 (66.7)</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Historical of alchool (n, %)</td><td>No</td><td>31 (30.4)</td><td>71 (69.6)</td><td rowspan="2">0.873</td><td rowspan="2">0.076-9.991</td><td rowspan="2">0.913</td></tr>
<tr><td>Yes</td><td>1 (33.3)</td><td>2 (66.7)</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Diabetic family history (n, %)</td><td>No</td><td>20 (27.8)</td><td>52 (72.2)</td><td rowspan="2">0.673</td><td rowspan="2">0.280-1.618</td><td rowspan="2">0.375</td></tr>
<tr><td>Yes</td><td>12 (36.4)</td><td>21 (63.6)</td></tr>
<tr><td>8</td><td colspan="2">Systolic blood pressure (mmHg)</td><td>133.33 ± 20.17</td><td>135.16 ± 22.05</td><td></td><td></td><td>0.522</td></tr>
<tr><td>9</td><td colspan="2">Diastolic blood pressure (mmHg)</td><td>76.56 ± 11.67</td><td>77.30 ± 10.58</td><td></td><td></td><td>0.760</td></tr>
<tr><td>10</td><td colspan="2">BMI (kg/m^2)</td><td>23.43 ± 2.84</td><td>23.78 ± 3.46</td><td></td><td></td><td>0.592</td></tr>
</table>

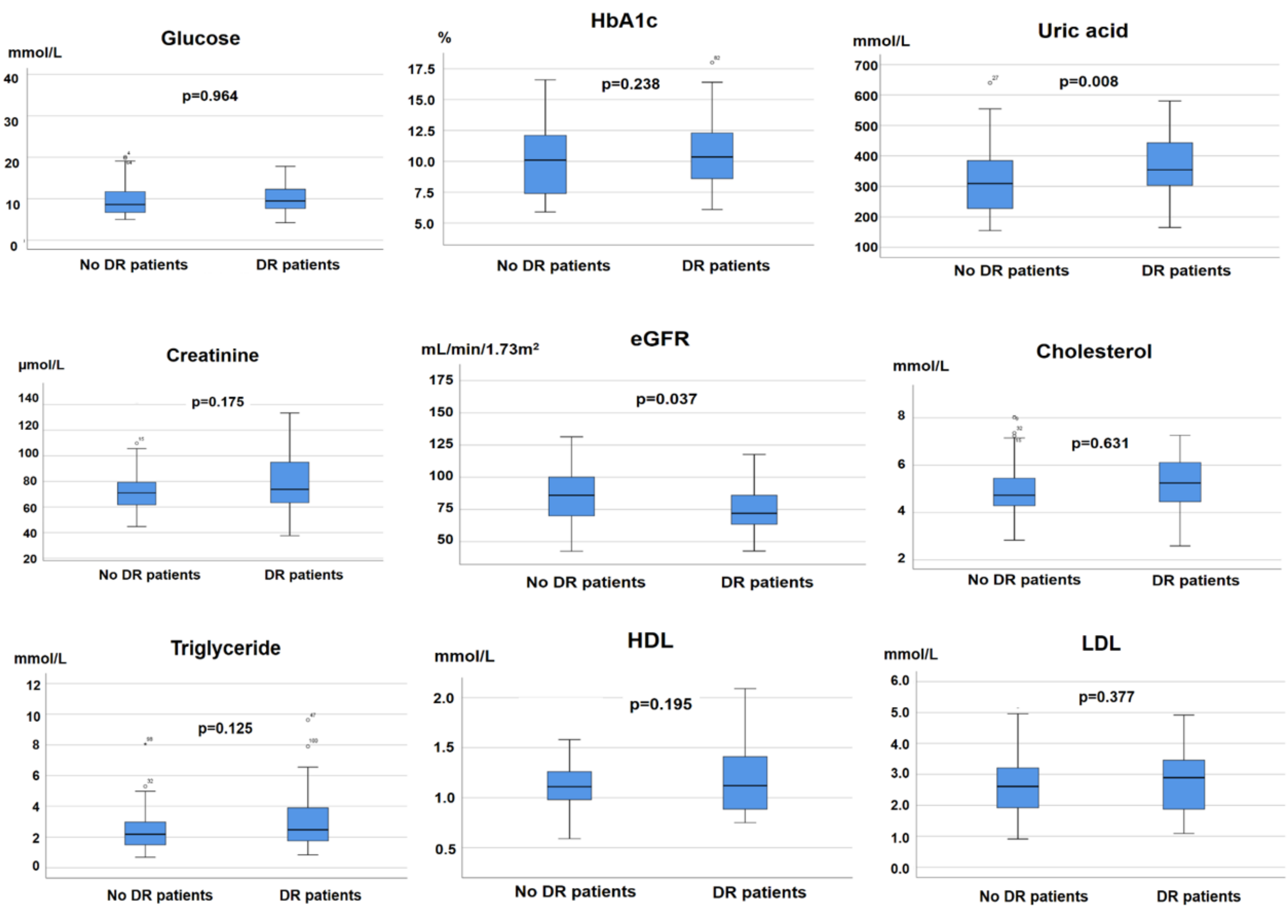

Figure 1. Some biochemical indicators between patients with and without DR

DR patients had a significantly higher age than no DR patients ($p<0.05$). Most DR patients were older than 60 years (28/32 patients). The effect of age on DR progression was not well established, some studies have shown that older age is a risk factor for progression of DR, there were also some studies that do not clearly show this result (Ahmed RA, 2016). We thought that the confounders such as genetic, environmental, or lifestyle variables may explain discrepancies in the influence of age on diabetic retinopathy among studies. In contrast to a study from Sweden that documents higher rates for women than men and studies from Saudi Arabia where DR was observed to be more prevalent in male diabetics, our study found no significant gender difference in the development of DR, which is in agreement with multiple studies (Ahmed RA, 2016). Systolic blood pressure was high in both groups (>130mmHg). Longitudinal research of United Kingdom prospective diabetes research group, hypertension has been identified as a risk factor (Group, 1998). According to a study from the United Arab Emirates, DR is only slightly linked with hypertension. Many others, on the other hand, could not uncover any evidence of hypertension playing a role in the development of DR (Ahmed RA, 2016). There was no difference in DR circumstances between individuals with hypertension and those who did not have hypertension in our research. BMI and smoking were not shown to be significant risk factors in our study. Although, smoking was found to be related to an elevated risk of DR in other studies (Ahmed RA, 2016). This finding may be due to the fewer number of smokers in our study. From Table 2, we saw that the longer the duration of diabetes, the higher the risk of DR. Having diabetes for more than ten years increased the risk of DR by 13.810 times ($p<0.001$). This might explain why, in this study, diabetes duration was found to be a substantial risk factor for retinopathy, and this was confirmed in the majority of DR investigations, implying that diabetes length is likely the best predictor of DR formation and progression. This is most likely related to the small blood vessel effects that cause diabetic microvascular problems. According to Lopez M.'s research, people with DM for more than 15 years are 5.3 times more likely to develop DR than those with DM for less than 5 years (Maribel López, 2017).

There was no difference in blood glucose and HbA1c levels between DR and non-DR patients in our study. However, both groups had extremely high levels of these two indicators. Several studies have found a link between persistent hyperglycemia (high HbA1c) and the development of DR. On the other hand, research in Saudi Arabia found no significant relationship between glycemic control and DR (Ahmed RA, 2016). Our investigation revealed that blood levels of cholesterol, high triglyceride, LDL, and HDL cholesterol did not have a favorable connection with the development of DR, similar to van Leiden's study, while contrary findings were obtained in studies by Binh, V.T. (Ahmed RA, 2016; Vu Thanh Binh, 2021).

In our study, uric acid levels in DR patients were significantly higher than in no DR patients (p=0.008). Uric acid has direct effect on endothelial cells and vascular smooth muscle cells. Thus, uric acid has an association with microvascular diseases. Several studies have reported that uric acid levels have been shown to increase with the severity of DR in patients with type 2 diabetes (Liang C-C, 2016). The eGFR of DR patients was significantly greater than that of non-DR patients (p=0.037), as seen in Figure 1. Lopez M. and Man R.E.K. reported similar findings. For DR, eGFR has been suggested as a viable alternative biomarker (Maribel López, 2017; Ryan Eyn Kidd Man, 2015).

From the above results, we found that age, uric acid blood levels, eGFR and duration of diabetes mellitus differ between two groups no DR and DR patients. However, patients are affected by many factors, not individual factors. Therefore, we conducted multiple variate logistic regression analyses between the two groups with these factors. Results are showed in Table 3.

Table 3. Several factors are associated with DR

No	Factors	Regression coefficient	p
1	Age	0.034	0.373
2	Uric acid	0.004	0.106
3	Duration of DM ≥ 10 years	-2.337	**<0.001**
4	eGFR	-0.001	0.928
5	Constant	-1.007	0.795

Table 3 showed that age, uric acid blood concentration, eGFR, duration of DM ≥10 years increase the likelihood of DR, in which uric acid blood concentration had the most substantial impact then on age, and duration of DM ≥10 years. Of these factors, the duration of DM ≥10 years was independently related to DR (p <0.001).

The regression analysis showed that longer duration of diabetes was independently association with DR. The longer the duration of the disease, the higher the risk of DR as well as other complications of diabetes. Therefore, it is even more important to monitor and control diabetes treatment to minimize complications, especially in the context that the prevalence of diabetes is increasing rapidly globally.

Conclusion and Recommendations

Research conducted on 105 type 2 diabetic patients showed age, uric acid blood levels, eGFR, duration of diabetes over 10 years are risk factors for DR. Furthermore, having diabetes for more than ten years increases the risk of diabetic retinopathy by 13.81 times compared to other individuals.

Acknowledgement

We would like to thank the support of the Ministry of Science and Technology, funding for the project code NDT.69/CHN/19; Sincere thanks to the Board of Directors of the University of Medicine and Pharmacy - VNU, the Board of Directors of Hospital E, the staffs working at the Department of Basic Sciences in Medicine and Pharmacy - University of Medicine and Pharmacy, VNU-Hanoi; The staffs of Department of General Internal Medicine, Department of Ophthalmology and Department of Biochemistry - E Hospital for supporting and facilitating us to carry out this study.

Vu Van Nga was funded by Vingroup Joint Stock Company and supported by the Domestic PhD Scholarship Programme of Vingroup Innovation Foundation (VINIF), Vingroup Big Data Institute (VINBIGDATA), code VINIF.2020.TS.79".

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Sabungai (Gynura Procumbens): A High Calcium-Low Sugar Ice Cream

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Abstract - The study was conducted to develop a new variety of ice cream from Sabungai (Gynura Procumbens), a medicinal plant. The purpose of this study was to determine the shelf life, sugar and calcium content. It used a descriptive research design to define the extent of its acceptance among the participants. The findings indicate that the developed Sabunga (Gynura Procumbens) Ice Cream contains low sugar and has a high calcium content. In terms of acceptability among adult participants, it gained a grand mean of 8.11, "LIKE VERY MUCH". In conclusion, the developed Sabungai (GP) ice cream is acceptable. Having a low sugar content implies that it is safe to eat and can be eaten by diabetic people, more so by health-conscious individuals who refrain from eating sweet desserts. It also contains high calcium, which may be a remedy to address the problem of the low calcium intake of mostly low-income Filipinos and is beneficial to women who experience premenstrual syndrome (PMS) as well as pregnant and lactating women. It is recommended to conduct further studies to fully claim that the product can be eaten by individuals with diabetes because of its low sugar content, and to the extent of introducing the product to the market, it is recommended to undergo time-series laboratory testing.

Keywords - Food Technology, Innovation, Entrepreneur/ Business.

Introduction

Earth grounds are rich with simple remedies that offers restoration of health. There are many simple yet unknown but not harmless herbs that can be used in place of a prescribed medicine. Notably, South East Asia like China, Indonesia, Malaysia, Thailand and Philippines, is rich from a plant called Sabungai or "Gynura Procumbens." It is also known as longevity spinach, anti-cholesterol, wonder plant, Bai Bing Cao (which means "100 ailments"), sabung nyawa, life extender, daun dewa, akar sebiak, or kelemai merah. Hence, it is used as a traditional medicine that treat different types of diseases. For instance, Indonesian used it to relieve kidney discomfort, while, Vietnamese used it to alleviate inflammation, rheumatism and medication of viral ailment (Wiart, 2006).

Furthermore, Shiphard (2010) highlighted that the leaves and shoots of Sabugai (g. procumbens) are eaten fresh in salads, which have a similar taste to raw green beans. It can be added as well to rice, noodle dishes, soups, and other savory meals by simply sautéing it with butter. Moreover, it can be used as a disease intervention, such as anti-hypertensive, lowering of glucose, inflammatory and fever. Basically, it is a source of protein and peroxidase that lowers cholesterol, treats high blood pressure, and regulates blood sugar levels. It is an effective remedy against diabetes and it helps inhibit the growth of cancer cells.

Though this plant is promising, it is still considered unutilized and unknown to many. However, the researcher has found a few individuals in a particular barangay of Zamboanga City who eat the said herb for at least 2-3 raw leaves every morning as an alternative maintenance for diabetes due to its low sugar content. In the same manner, Sabungai (g. procumbens) contains high calcium content that is needed by the body to maintain strong bones and function well in daily activities. Fanous (2018) stressed that calcium is even more important for women to ease premenstrual syndrome (PMS). Essentially, a person aged 9–18 needs to consume 1,330 mg of calcium a day or more, especially pregnant and breastfeeding teens.

Having a realization of its nature and benefits, the researcher has conceptualized the use of Sabungai through ice cream production to maximize its beneficial effects on the health of individuals who need low sugar and high calcium content. Typically, in a serving of 100g of ice cream, it contains approximately 16–17% or approximately 169 mg more or less of calcium. With the Sabungai plant, as a frozen sweet dessert or ice cream containing a high calcium content needed by the body of an individual, nutrients can be maximized.

Thus, the researcher aimed to introduce this herb to the community through the production of a low-sugar, high-calcium ice cream using the leaves of this wonder plant called Sabungai (Gynura Procumbens) as its main component.

Methodology

The first step in designing a new product, the design phase in the product life cycle, is basically research and development. It is therefore an act of discovering completely new science that can be used to produce new goods (Starver, 2018).

The researcher took the initiative to create a frozen dessert or ice cream product made from a Sabungai (Gynura Procumbens) herbal plant. It also conducted food analysis, a discipline dealing with designing, applying, and researching analytical procedures for characterization of the properties of foods and their constituents (McClements, 2003). For examination, the sugar and calcium content of the sample were brought to a laboratory.

Relatively, a descriptive research design was used by the study to define the extent of its acceptance among the participants. In terms of aroma, color, taste, and texture, the shelf life and the aesthetic characteristics of the Sabungai ice cream have also been determined.

Product Development

With Sabungai (Gynura Procumbens) as the key ingredient, the researcher produced a low-sugar, high-calcium ice cream. Different stages were carried out to produce this product. Step 1 is represented below.

Flowchart for the First Stage of Sabungai (Gynura Procumbens) Ice Cream Production

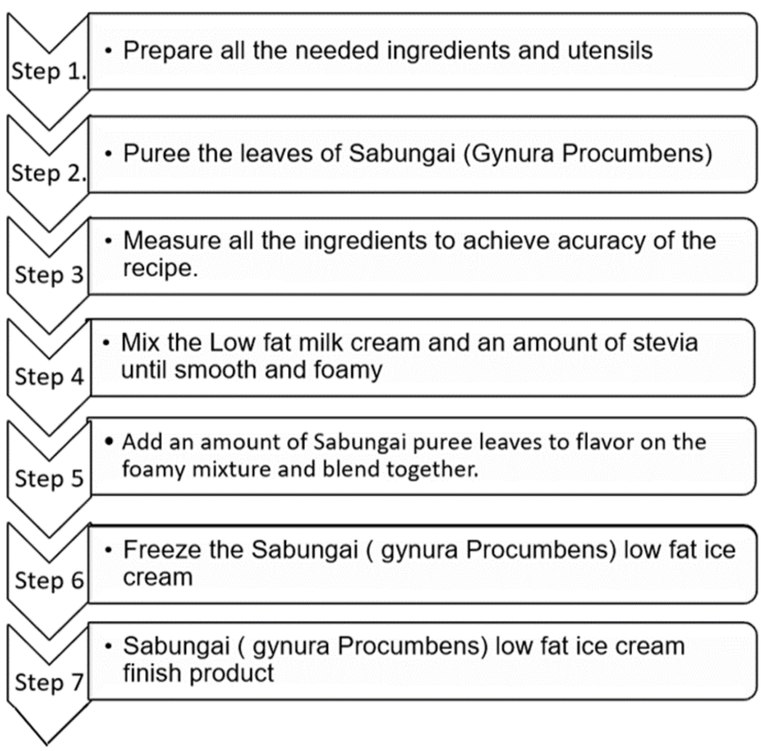

Figure 2. Flowchart on the production of Sabungai (Gynura Procumbens) ice cream

Stage 2: Laboratory Testing

Stage 2 is the process in which the Sabungai Ice Cream product is submitted to the Department of Science and Technology (DOST) for laboratory testing, particularly its sugar and calcium content. This further aimed to determine the amount of sugar and calcium present in a typical serving of the Sabungai ice cream product.

Stage 3: determining the level of acceptability in terms of aesthetic qualities

Stage 3 addresses the level of acceptability among the participants in terms of aesthetic characteristics such as scent, taste, and texture. The participants sampled the Sabungai (Gynura Procumbens) Ice Cream on the basis of their desire to use their senses in smelling, seeing, and tasting.

Results and Discussions

This chapter presents the laboratory test results and other data that were processed, analyzed, and interpreted to justify the formulated statements.

Problem Statement Number 1. What is the sugar and calcium content of the product?

Table 1. Sabungai (GP) Ice Cream Sugar Content (approx.. 20g)

Sample Sabungai (GP) Ice Cream (approx. 20 g)	Parameter	Department of Science & Technology (DOST) Result
Sugar	Total Sugar, g/100g	1.66 g

Table 1 shows the result of the sugar content of the sample Sabungai (gp) Ice cream from the Department of Science and Technology (DOST). It reveals that in an approximately twenty (20) grams of sample product contains only a 1.66 g of sugar. This implies that it is safe to eat and can be eaten by diabetic persons more so with health-conscious individual who hinder themselves eating sweet desserts.

As supported by (Wersja, 2015) and (Christensen, 2018). The plant itself is called God's leaves and is renowned for its antidiabetic contribution. Apart from having an anti-diabetic property it is also known for its anticancer and hypotensive assets as well as packed with vitamins such as A, B1, B2, B3, B6, B9, C, E, K as well as calcium, iron, phosphorus, and potassium.

Top 4 Known Ice Cream Brand Code	Sugar content per 100ml
A	11 g
B	10 g
C	13 g
D	9 g
Sabungai (Gynura Procumbens) Ice Cream	8 g

Table 2. Sugar Content of Top four (4) known Ice Cream Brand

Table 2 display the four (4) known ice cream brand in the market and its sugar content per 100 ml of serving as surveyed by the researcher. First, brand A contains 11 g of sugar per 100 ml of serving. Second, brand B contains 10 g of sugar in a 100 ml serving. Third, brand C has 13 g of sugar per 100 ml serving. Fourth, brand D contains 9 g of sugar per 100 ml serving. Lastly, the develop Sabungai (g.p) ice cream contains 8 g of sugar per 100 ml of serving.

This discloses that the product sabungai (gp) ice cream has a promising market if commercialized considering it has low sugar content as compared to the few known commercial ice cream brand as shown in table 2.

Because of its low sugar content along with its other benefits this may deviate numerous ailments including obesity, type 2 diabetes, heart disease, and many forms of cancer which may contribute to a healthier life. (Gunnars, 2019).

Table 3. Calcium Content per approx. 20g Sabungai (GP) Ice Cream

Sample Sabungai (GP) Ice Cream (approx. 20 g)	Parameter	Department of Science & Technology (DOST) Result
Calcium	Calcium mg/100g	36.6 mg

Table 3 displays the Department of Science and Technology (DOST) laboratory result on the amount of calcium the developed sabungai (g.p) ice cream has. Result shows that in an approximated 20 g of Sabungai (g.p) Ice Cream has a 36.6 mg of calcium content, a far higher as compared to the calcium content of the other commercial ice creams brand in the market.

Data discloses that the sabungai (g.p) ice cream evidently has high calcium content that is good for teeth and bones formation and are needed by the body in order to circulate blood, move muscles, and release hormones. This as well is beneficial to women who experience premenstrual syndrome (PMS). (Fanous et.al,2018)

Dietary Allowance (RDA) for adult is equivalent to 1,000 mg up to 2,500 mg upper limit. With the result given by the Department of Science and Technology with the calcium content of sabungai (gp) ice cream this can be a remedy to address the problem in the low calcium intake of Filipinos. (Vila, 2014)

Table 4. Calcium content of Top four (4) known Ice Cream brand (per 100g)

Ice Cream Brand, (profile for 100g serving)	Calcium Content per 100g
A	169 mg
B	161 mg
C	160 mg
D	159 mg
Sabungai (Gynura Procumbens) Ice Cream	183 mg

Table 4 illustrate the calcium content among the top four (4) ice cream based from the Ice cream list, calcium content per 100g. First, Ice cream A contains 169 mg of calcium in every 100g of ice cream. Second, Ice cream B has an amount of 161 mg of calcium in every 100 g. Third, ice cream C has 160 mg of calcium in every 100 g of ice cream. Fourth, ice cream D has 159 mg of calcium and fifth, lastly the developed sabungai (g.p) ice cream contains an approximately 183 mg of calcium in every 100 g of ice cream which is far higher as compared to the top four (4) ice cream. This give a strong foundation of being patronized in the market once commercialized. Using sabungai with low sugar property, this may give an opportunity to meet the needed calcium intake a day by patronizing the plant alone or the developed sabungai (gp) ice cream which is affordable and can be planted anywhere.

Certainly, the result of the study may answer the assessment carried out by (Agdeppa et.al, 2016), regarding the very low calcium intake of the groups belonging to the poorest population. In addition to, the result may hint at that the sabungai (gp) ice cream contribute to aid bone deficiency an may relieve symptoms of premenstrual syndrome (PMS) specially to women more so become the solution to the insufficient calcium intake of nearly 90 percent of Filipino households. (Vila, 2014).

Problem Statement Number 2. What is the shelf-life of the product?

Table 5. Shelf-Life of Sabungai (gp) Ice Cream

Sample	Manner of Observation	Past Printed Date	Remarks
Freezer			
A	Unopened	3 months & 22 days	Edible however its texture becomes icy
B	Opened	1 month and ½	It started to shows formation of darker color green in the lid of the container
Room temp.			
C	Unopened	At least 48 HRS	Edible however it texture becomes watery
D	Opened	24 hours	Has a very tiny ice shards forming on top of the ice cream and under the lid of the container which is a common indicator that the Ice Cream is no longer edible

Table 5 shows the average shelf life of the Sabungai Ice Cream using a time series approach or method. The Sabungai (GP) Ice Cream product, upon development, was placed in the freezer. There were four samples that had been observed. Sample A is unopened, and Sample B is opened inside the freezer. The other two (2) samples were left at room temperature, sample C unopened and sample D open.

The sample A lasted for about three (3) months and twenty-two (22) days in the freezer unopened (January 29, 2019) and lasted until May 20, 2019. Sample B was left open inside the freezer and lasted for at least one and a half months (1 & 1/2), more or less. Technically, if the ice cream is stored safely, it will last for up to three to four months. (Williams, 2020). While sample C was left at room temperature, which lasted for at least 48 hours. More so, sample D left open at room temperature only lasted for a day.

As per observation, the two samples under room temperature started to have a tiny bubble form on top of the ice cream, and under the lid of the container was a paste like residue, which is a common indicator that the ice cream is no longer edible.

Problem Statement Number 3. What is the aesthetic characteristic of the product in terms of its aroma, appearance, taste & texture?

Aroma

Majority of the participants agreed that the aroma of the developed product Sabungai (g.p) ice cream is evident. Few of the participants mentioned that they did not notice the distinct aroma of sabungai in the development ice cream. However, one of the participants suggested the researcher to lessen the amount of sabungai, because of its strong scent which do not meet his/her preference. The result shows that every individual has an extensive difference between every participant in how they sense odors. This has something to do with the olfactory receptor in the nose that encode information about the properties of odors even before it is transmitted in the brain. (Mainland and Trimmer,2019)

Appearance

Some of the participants described the appearance of the developed product as having a light green color. Similar to other participants, they described it as having an avocado ice cream like appearance. This has something to do with the perceived ice cream appearance seen by the subject, leading him to immediately conclude the appearance of the developed product. The eye alone cannot make sight possible without the brain. (eSchooltoday, 2020)

Taste

Five (5) participants simply concluded that the developed product is delicious. Others were more detailed in giving their impressions on the product, wherein ten (10) participants claimed that it was "not too sweet," two (2) participants mentioned that it tastes like guava, and another two (2) commented that the distinct taste of Sabungai (Gynura Procumbens) is missing. Additionally, two (2) participants state that there is a little bitter aftertaste. In contrast, one (1) participant expressed that the developed product has no aftertaste.
FONA's Director of Sensory Services gives a clear view of having multiple perceptions of the results, particularly the taste. The taste perception of the participants varies according to age, since taste discrimination tends to decrease with age. Also, the meal they ate prior to the taste test may have come into contact with chemical compounds that greatly decrease the taste bud's ability to register salty, sweet, sour, and bitter tastes. (Lori Walker, 2015).

Texture

On these aspects, the majority of the participants answered that the developed product is creamy and easily melts in the mouth. One (1) participant answered that the texture is foamy.

Overall, the developed ice cream has its own distinct aroma, as claimed by the majority of the participants. On the basis of appearance, participants immediately identify the light green color and say it is similar to avocado ice cream. For its taste, almost all of the participants concluded that it was delicious, while the texture of the developed ice cream was defined as creamy and melting easily in the mouth.

Problem Statement Number 4. What is the level of acceptability of the Sabungai: A Low Sugar-High Calcium Ice Cream among the participants in terms of; Aroma, Appearance, Taste and texture?

Table 6. Level of acceptability of Sabungai: A Production of Low Sugar-High Calcium Ice Cream

Variable	$\bar{X}$ Mean	Description
• **Aroma**	7.97	Like Very Much
• **Appearance**	8.12	Like Very Much
• **Taste**	7.95	Like Very Much
• **Texture**	8.4	Like Very Much
Grand Mean	**8.11**	**Like Very Much**

Legend: Dislike extremely: (1-1.95), Dislike very much: (1.96-2.91), Dislike moderately: (2.92-3.87), Dislike slightly (3.88-4.83), neither like nor dislike: (8.84- 5.79), Like slightly: (5.80- 6.75), Like moderately: (6.76- 7.71), Like very much: (7.72- 8.67), Like Extremely; (8.68-9.0)

Table 6 shows the summary of the level of acceptability of the Sabungai (Gynura Procumbens): A Low Sugar, High Calcium Ice Cream, among forty (40) adult participants using the Hedonic Scale. The result shows that the level of acceptability in terms of its aroma gained a 7.97, meaning that it is under a numerical description of "LIKE VERY MUCH". More so, the appearance gained an average mean of 8.12, which also indicates a numeral description of "LIKE VERY MUCH". On the other hand, the results show that the average mean of 7.95 for the acceptability of taste was also under the category of "LIKE VERY

MUCH" and the acceptability level of texture shows an average mean of 8.4, which is also categorized as "LIKE VERY MUCH". The study gained a grand mean of 8.11 "LIKE VERY MUCH" in terms of its aroma, appearance, taste, and texture. This points toward the acceptability of the developed Sabungai (gp) Ice Cream regardless of status and health preference, with a promising profit once out in the market.

Summary of Findings

This study was conceived with the objectives of determining the sugar and calcium content as well as the level of acceptability in terms of aroma, appearance, taste and texture of the Sabungai (Gynura Procumbens) Ice Cream as well as the developed product shelf-life. On the whole the developed Sabungai (gp) Ice Cream based from the result of the Department of Science and Technology (DOST) it has a low sugar content technically implies that it is safe to eat and can be eaten by diabetic persons more so with health-conscious individual who hinder themselves eating sweet desserts.

The developed product has a huge advantage in the market considering it has low sugar content as compared to the few known commercial ice cream brand along with its other benefits this may halt numerous ailments including obesity, type 2 diabetes, heart disease, and many forms of cancer. Gunnars (2019).At the same time, the sabungai (g.p) ice cream based from the DOST result evidently has high calcium content. Calcium is good for teeth and bones and are needed by the body in order to circulate blood, move muscles, and release hormones. This as well is beneficial to women who experience premenstrual syndrome (PMS) more so with lactating women, (Fanous et.al (2018).

In particular the recommended Dietary Allowance (RDA) for adult is equivalent to 1,000 mg up to 2,500 mg upper limit. With the result given by the Department of Science and Technology (DOST) with the calcium content of sabungai (gp) ice cream this can be a remedy to address the problem in the low calcium intake specially to the low earner Filipinos, (Vila, 2014).

Moreover, the shelf life of Sabungai (Gynura Procumbens) Ice Cream product lasted three (3) months and twenty-two (22) days unopened in the freezer, if opened and kept refrigerated, it lasted up-to 1 month and 1/2. If left in a room temperature unopened the product lasted at least 48 hours, while opened and left in a room temperature the developed product only lasted for a day (24 hours).

In the level of acceptability of the Sabungai (Gynura Procumbens) Ice Cream among the forty (40) adult respondent's results show that in terms of its aroma gained a 7.97 mean that falls under a numerical description of "LIKE VERY MUCH". More so, the appearance gained an average mean of 8.12 which also indicates a numeral description of "LIKE VERY MUCH". On the other hand, result shows that the average mean of 7.95 for the acceptability of Taste was also under the category of "LIKE VERY MUCH" and the acceptability level of Texture shows the average mean of 8.4 which as well categorize as "LIKE VERY MUCH". The study gained a grand mean of 8.11 "LIKE VERY MUCH" in terms of its aroma, appearance, taste and texture. Which means the developed Sabungai (GP) Ice Cream is acceptable regardless of status and health preference. This implies the sabungai (gp) ice cream is having a promising profit once out in the market.

Acknowledgement

This professional growth would not be possible without the favor of our Almighty God.

The researcher wishes to express her deepest appreciation to all who have offered a helping hand in any way in making this paper worthwhile.

For Dr. Annabelle F. Mortera, advisor, for her constant encouragement, time, and support in the completion of this paper.

Dr. Carlos C. Lolo, panel chairman, for his guidance, advice, and encouragement to pursue professional growth.

Prof. Renante M. Cabato, panel members for their unceasing patience, valuable suggestions, and support during the oral defense.

panel member for her unceasing patience, valuable suggestions, and support during the oral defense as well as her technical expertise in the improvement of the final copy of the paper.

For Dr. Fe E. Lim, Dean of the Graduate School, for her encouragement throughout the study.

The Zamboanga Peninsula Polytechnic State University for the financial assistance headed by the college President, Dr. Nelson P. Cabral, for his support and approval of the researcher's sabbatical.

Prof. Manuelito B. Tibor for donating his time and statistical knowledge.

Thanks to Carl Joseph B. Burlat, School Librarian, for accommodating the researcher with her needs in the library.

For Fati Mae G. Fernandez, Reymart Manalo, and Maria Cathie C. Aljas, her dearest and ever-supportive friends, for their time, encouragement, and support.

Lastly, but definitely the most important, my family, especially to Zac Zane Yavin Sisnorio, the researchers' inspiration in pursuing this study.

And to all those who were not mentioned but who, in one way or the other, had supported the completion of this paper.

Thank you so much, and God bless.
C. B. Sisnorio

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Sensory Evaluation Of The Pork-Duck Meat Longanisa

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Abstract - This study on different ratios of pork- duck meat longanisa which aimed to innovate the duck meat into longanisa and to evaluate its palatability and consumers acceptability. A Nine (9) Point Hedonic Scale Test was used to analyze the rating of the respondents. The parameters were the appearance, aroma, taste, texture, and overall acceptability which were evaluated by 30 respondent which composed of 10 faculty, 10 students and 10 meat processors in three (3) trials which represented as replicates. The data revealed that in terms of appearance, Treatment G with 200 grams of duck meat and 800 grams of pork mixture is more acceptable. The mixture of 60/40, 70/30 and 80/20 pork and duck meat are more acceptable in longanisa in terms of aroma. In terms of texture, Treatment G with 200 grams of duck meat and 800 grams of pork mixture is more acceptable. The different mixture ratio of pork and duck meat longanisa does not have an effect in terms of taste. The overall acceptability was favored to 200 grams of duck meat and 800 grams of pork longanisa mixture. Further study using different ratios of pork- duck meat specially in terms of shelf life must be conducted. Also, can be observed from the data gathered the most acceptable ratio after the three trials were those of 80/20 ratio.

Keywords - 9-point Hedonic scale test, processed meat products, product development, food innovation.

Introduction

Longanisa refers to sausage-flavored with indigenous spices, with each region having its own specialty. Among others, Lucban is known for its garlic-laden longanisa's (dererecado, "spiced"); Guagua for its salty almost sour, variety. Longanisang hamonado (from Spanish): longanisa hamonado is distinctively sweet in taste. Unlike Spanish chorizo, Filipino longanisas can also be made of chicken, beef or even tuna. Commercial varieties are made into links, but homemade sausage may be simple patties. Duck raising is highly lucrative business in the Philippines primarily of the eggs they produce. Ducks could be grown away from the lake or bodies of water since formulated feeds could properly nourish them. Farmers who raise in backyard, ducks were provided with snail, shrimps, fishes as protein source and palay: the high demand for embryonated eggs (balut) and salted eggs showed a bright prospect to the duck industry. Unproductive or culled ducks are sold for meat.

Protein and fat are two important nutrients in meat products. The protein content of duck meat is relatively lower than in other poultry meats. The protein content of duck meat is relatively lower in other poultry meats. The protein content of duck breasts and legs are 20.8 and 19.6%, respectively (Cobos et al., 2000). When compared to other reports, it is concluded that the protein content of duck meat in that study is lower than the protein content in chicken (Jaturasitha et al., 2008) and turkey (Maruyama et al, 1996). These reports indicate that the protein of chicken breasts and thighs is 23,6-24.8% and 20.1-21.7%, respectively, whereas the protein content in breasts and thighs of turkey meat is 25.0 and 21.0%, respectively.

The pH range of duck meat is 5.4 to 6.3 (Erisir et al., 2009). The ph of duck meat, however is related to its glycogen content. A higher glycogen contents result in lower ph levels. Essential amino acids expressed as a percentage of total proteins in different duck found in duck meats: 6.01-8.08% of phenylalanine and tyrosine, 3.21-6.14% of isoleucine, 7.67-8.45% of leucine, 8.60-9.57% of lysine, 3.11-3.26% of methionine and cysteine, 4.11-5.22% of threonine, 0.70-1.25% of tryptophan and 3.67-7.01% of valine (Woloszyn et al., 2006).

Duck meat can be processed in several ways. It can be cook as roasted duck, adobo, gata and other recipes. Since meat from culled duck are tougher and poor quality, it can be incorporated with other meat like pork to make it juicy and palatable. Adding pork fat in duck meat will enhance the taste, juiciness and palatability of the product. Hence, the study.

The general objective of this study was to innovate the duck meat into longanisa and to evaluate its palatability and consumers acceptability. Specifically, it aims: To determine the appropriate ratio of pork-meat meat longanisa.; to evaluate the organoleptic characteristics of pork-duck meat longanisa in terms of appearance, aroma, taste, texture and overall acceptability; and to determine the level of acceptability of the final product

Methodology

The Conceptual Framework

The study on Pork-Duck Meat Longanisa was conceptualized considering the three major factors: Inputs, Process and Output. The Input was the identification of the ingredients and proportion and materials in making pork-duck meat longanisa, the process encompasses the procedure on making the product and the output was the quality product longanisa.

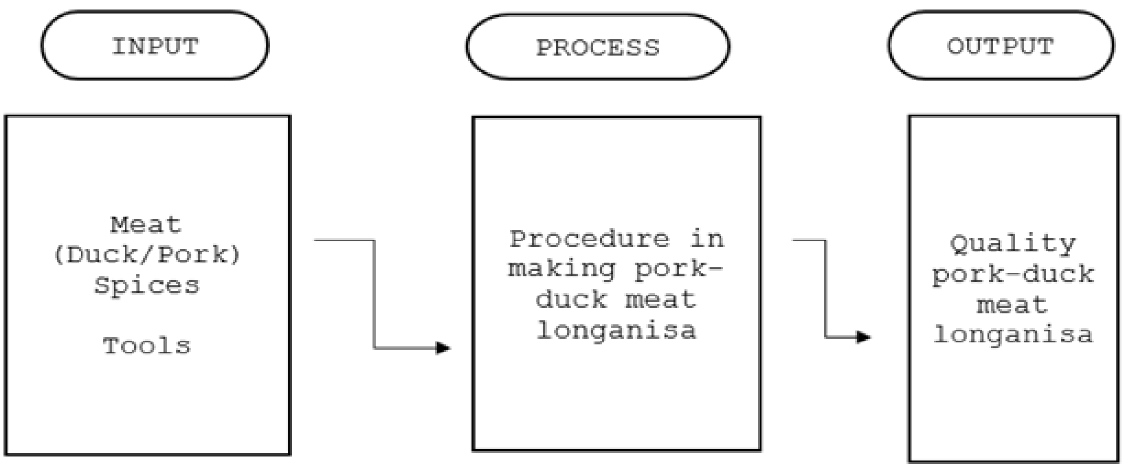

Fig. 1 Paradigm of Conceptual Framework

Materials

Duck-pork meat used at different ratios in meat longanisa sausage. A total of 7 treatments used in this study using different amounts of duck-pork meat. Fifteenth slaughtererd duck weighing 2.4-2.8 kg was used/ dressed conventionally duly following of animal welfare act the experiments of animals the whole carcass, weighing 1.2-1.4kg, were chilled to an internal temperature prior to deboning. The dressed whole carcasses were deboned raw, in four separates batches.

Ingredients

Ingredients used in the study are the following, pork duck meat other materials are plastic funnel, microwavable container weighing scale (grams), cling wrap, natural casing.

Pork-Duck Meat Longanisa Ingredients

- Ground duck meat and Cubes pork fat/ 1kg
- 2g curing salt
- 18g coarse salt
- 120g sugar
- 20g crushed garlic
- 2 tbsp anisado wine
- 10g black pepper
- Asuete (optional)
- 1g magic sarap

Procedure

- Mix all dry ingredients and add meat mixture.
- Cure at refrigerator temperature or at room temperature for 8-10 hours
- Put mixture in natural casing with 20g weight
- Cure overnight
- Cook in moderate flame and serve.

Research Design

This study was an experimental type of research having the following treatments and were replicated (trial) four times each trial represents a replicate.

Treatment A – 80/20, 800g duck meat and 200g pork
Treatment B – 70/30, 700g duck meat and 300g pork
Treatment C – 60/40, 600g duck meat and 400g pork
Treatment D – 50/50, 500g duck meat and 500g pork
Treatment E – 40/60, 400g duck meat and 600g pork
Treatment F – 30/70, 300g duck meat and 700g pork
Treatment G – 20/80, 200g duck meat and 800g pork

Pork- duck meat longanisa flow chart

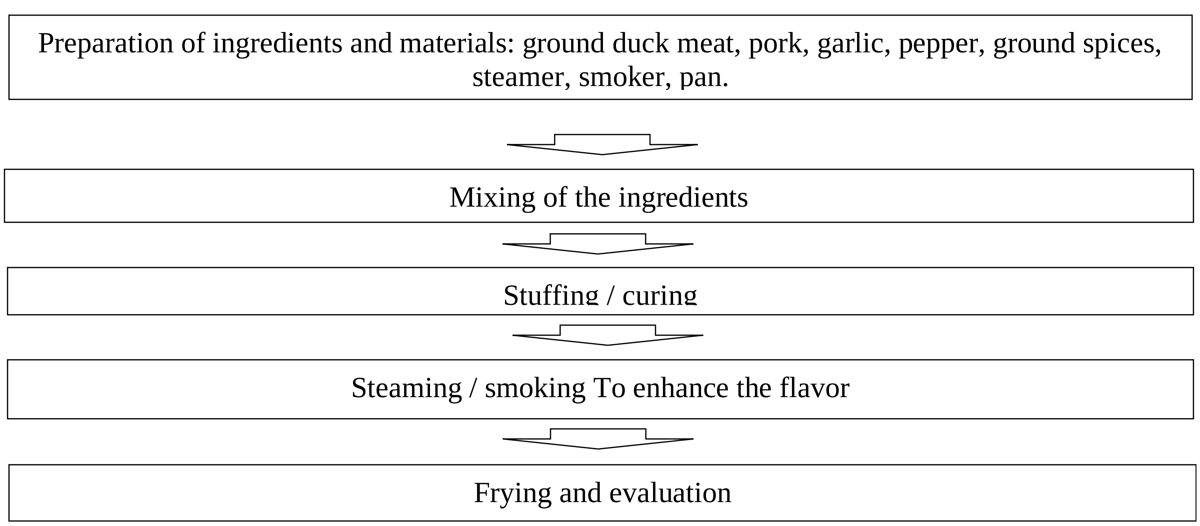

Fig. 2 Process Flow chart on the procedure of pork- duck longanisa

Research Respondent

The finish product was evaluated by 30 evaluators, 10 faculty members from food technology department, 10 students, 10 meat processor or restaurant owners. Each trial represents a replicate. The treatments were arranged in Complete Randomized Design (CRD). Seven treatments were replicated (trials) trice. Each trial represents a replicate.

Research Instrument

An evaluated using 9-point Hedonic scales was used in this study to assess the attributes of the product as to taste, aroma, appearance, texture, characteristic as overall acceptance. Each attribute corresponded to the sensory of the product.
Interpretation of data was done using an adjectival rating in 9-point hedonic scale. The scale was analysed using Hedonic 9- point Ranking analysis. Further analyzation was rendered using ANOVA of a RCBD design where the respondents correspond as the block, the second analysis was also done in RCBD Anova tools and the trials represented as the blocks. Further analysis on the treatment means was done in LSD analysis.

9-POINT HEDONIC SCALE	***Adjectival rating***
9	Like Extremely
8	Like very much
7	Like moderately
6	Like slightly
5	Neither like nor Dislike
4	Dislike slightly
3	dislike moderately
2	Dislike very much
1	Dislike extremely

Results and Discussions

The findings, results and discussions on the study of duck meat longanisa under 9-point hedonic scale interpretation of sensory test.

Appearance

As for the interpretation with regards to appearance, significant results were noted. And it can be observed that the lower the inclusion of duck meat in the longanisa, the more pleasing its appearance become. Specifically, those products with 20/80 ratio had significantly higher rating compared to its counterparts. On the other hand, still, those with higher levels of duck meat had slightly lower ratings in terms of appearance. The more inclusion of duck meat the less acceptable it becomes as observed generally from the results in terms of appearance.

Table 1. The means of the appearance of different mixtures of pork- duck meat longanisa

Treatment	*Appearance*
A-800g DM & 200g P	43.13^{a}
B-700g DM & 300g P	45.68^{a}
C-600g DM & 400g P	47.80^{a}
D-500g DM & 500g P	50.29^{b}
E-400g DM & 600g P	52.66^{c}
F-300g DM & 700g P	52.23^{c}
G-200g DM & 800g P	58.22^{d}
CV (%)	2.06

- Treatment means having the same superscript are not significantly difference at 5% level.

Aroma

Table 2. The means of the aroma of different mixtures of pork- duck meat longanisa

Treatment	*Aroma*
A-800g DM & 200g P	47.19^{ab}
B-700g DM & 300g P	45.29^{b}
C-600g DM & 400g P	51.59^{ab}
D-500g DM & 500g P	48.16^{ab}
E-400g DM & 600g P	51.91^{a}
F-300g DM & 700g P	53.16^{a}
G-200g DM & 800g P	52.70^{a}
CV (%)	2.10

- Treatment means having the same superscript are not significantly difference at 5% level.

The results in terms of aroma were significantly differ from each other. This indicates that the different ratio of pork and duck meat in this study effected the aroma of the product. The data showed that the higher concentration of pork in the mixture gained higher acceptability in terms of aroma. These results signify that in terms of aroma, the preference of the evaluators was pork longanisa. However, 50/50 mixture of pork and duck meat to 20/80 mixture showed same appreciation of the aroma. Moreover, in terms of aroma treatment E, F and G (with 60/40, 70/30 and 80/20 pork and duck mixture) were the most acceptable longanisa- like aroma.

Taste

With concern to taste, no significant differences were noted after statistical analysis of the sensory test results. Also, no trend can be observed from the data set. Yet, those products with the lowest ratio of duck meat were slightly tasty compared to its counterparts. The result implies that the consumers' preference in longanisa were the one that has the closest taste to the original pork longanisa that can be bought from any market.

Table 3. The means of the taste of different mixtures of pork- duck meat longanisa

Treatment	*Taste*
A-800g DM & 200g P	44.74
B-700g DM & 300g P	48.63
C-600g DM & 400g P	49.24
D-500g DM & 500g P	48.34
E-400g DM & 600g P	52.21
F-300g DM & 700g P	50.93
G- 200g DM & 800g P	55.92
CV (%)	*3.84*

Texture

Significant results were obtained after statistical analysis of the sensory evaluation in terms of texture. The results showed no difference as of the other parameters evaluated. The 200g duck meat & 800g pork (Treatment G) reveals significantly higher rating (P>0.01) in terms of texture than of the other mixture. It can be observed that the product with the lowest inclusion of duck meat were the most acceptable compared to other products evaluated in the study. This implicates that the preference on longanisa texture of the evaluators were the pork longanisa.

Significant results were obtained after statistical analysis of the overall results in terms of texture. The results showed no difference as of the other parameters evaluated. As can be observed, the product with the lowest inclusion of duck meat were the most acceptable compared to other products evaluated in the study.

Table 4. The means of the texture of different mixtures of pork- duck meat longanisa

`

`	*Texture*
A-800g DM & 200g P	42.43^{a}
B-700g DM & 300g P	44.54^{a}
C-600g DM & 400g P	50.43^{a}
D-500g DM & 500g P	47.52^{a}
E-400g DM & 600g P	53.99^{c}
F-300g DM & 700g P	54.78^{c}
G-200g DM & 800g P	56.33^{d}
CV (%)	2.71

- Treatment means having the same superscript are not significantly difference at 5% level.

Overall Acceptability

The overall acceptability of the product was significantly influence by the different ratio of duck and pork meat. Specifically, those with 50 and higher ratio were the most not acceptable compared than those with 50 or lower. Also, it can be observed from the data gathered, the most acceptable ratio after three trials were those of 20/80. The result implies that after three trials, consumers mostly prefer the lower inclusion of duck meat in the product. This can be due to the new formula of this longanisa or their preference must be of those closest to the traditional and original pork longanisa.

Table 5. The means of the overall acceptability of different mixtures of pork- duck meat longanisa

Treatment	*Overall acceptability*
A-800g DM & 200g P	44.52^{a}
B-700g DM & 300g P	46.67^{a}
C-600g DM & 400g P	48.23^{a}
D-500g DM & 500g P	46.31^{a}
E-400g DM & 600g P	53.07^{b}
F-300g DM & 700g P	52.58^{b}
G-200g DM & 800g P	58.61^{c}
`CV (%)	*2.5*

- Treatment means having the same superscript are not significantly difference at 5% level.

Conclusion and Recommendations

Based from the results of the study of pork- duck meat longanisa sensory evaluation, the conclusion were drawn In terms of appearance, Treatment G with 200 grams of duck meat and 800 grams of pork mixture is more acceptable; The mixture of 60/40, 70/30 and 80/20 pork and duck meat are more acceptable in longanisa in terms of aroma; In terms of texture, Treatment G with 200 grams of duck meat and 800 grams of pork mixture is more acceptable; The different mixture ratio of pork and duck meat longanisa does not have an effect in terms of taste; and the overall acceptability were favored to 200 grams of duck meat and 800 grams of pork longanisa mixture.

Based on the conclusion the recommendation was drawn that Pork duck meat longanisa with 80% pork and 20% duck meat is the ratio preferred by respondents, thus studies in terms of shelf life using the above-mentioned ratio must be conducted. Further study using 80- 20 ration of pork- duck meat must be conducted on varied flavors (e.g sweet, spicy, etc.). Encourage farmers to engage duck raising to sustain the pork- duck longanisa once product is commercialized.

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Advances in the Modulation of Breast Cancer Stem Cell Plasticity by the miR-200 Family

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Abstract - Breast cancer, the main cause of cancer mortality for women, is thought to be caused by sequence of genetic changes caused by cellular instability and/or oncogene-induced plasticity. The complex tumour microenvironment plays a key role in several malignant and non-malignant cell types. There is growing evidence that miR-200 expression modulates epithelial-mesenchymal transition (EMT) in cancers, which in turn promotes tumour invasion and metastasis. MiRNAs are necessary for the effective regulation of cellular activities, and their disruption causes aberrant cell growth and biosynthesis, which contributes to tumour formation, progression, and metastasis. In human cancer cell lines and mice models of cancer, suppression of miRNA synthesis by DICER1 depletion enhances cell proliferation and tumourigenesis. This review discusses the modulation of miR-200 on the characteristics of plasticity in breast cancer cells.

Keywords - Breast cancer, Tumour, Fibroblast, Metastasis, Epithelial-Mesenchymal Transition

Introduction

Malaysia has the second-highest cancer death rate in South-East Asia, with 18.4 per 100,000 people, behind Singapore's 18.5 per 100,000 (Tan et al., 2020). Breast cancer is the most common cause of cancer mortality among Malaysian women, with 5-year overall survival rates ranging from 43.5 to 75.7 percent and a median survival period of 68 months (Tan et al., 2020). The most common types of breast cancer are ductal carcinoma in situ (DCIS), a non-invasive breast cancer subtype that is limited to milk ducts and characterised by the development of lumps in the breast and the secretion of a discharge from the nipple; and invasive ductal carcinoma (IDC) or infiltrating ductal carcinoma, which is characterised by the invasion of lymph nodes and surrounding tissues, breast inflammation, and the secretion of a discharge (Chin & Lim, 2019; Gomes Do Nascimento & Otoni, 2020; Malla et al., 2019). Luminal A malignancy is low-grade, grows slowly, and has a good prognosis. Women with mutations in the BRCA1 gene are more likely to be afflicted with this kind of cancer. Next, HER2-rich tumours develop faster and have a poorer prognosis than luminal cancers, but it can generally be treated successfully with treatments that target the HER2 proteins Herceptin, Tykerb, and Kadcyla. Normal-like cancers shows hormone receptor positive, HER2 negative, and has low levels of the melanoma protein Ki67 (Chin & Lim, 2019; Molecular Subtypes of Breast Cancer, n.d.).

Cancer is thought to be caused by a sequence of genetic changes caused by cellular instability and/or oncogene-induced plasticity (Chin & Lim, 2019). CD44+/CD24 have been identified as surface markers for breast cancer stem cells (BCSCs). CD44 is a transmembrane glycoprotein that binds to a variety of extracellular matrix proteins. Cancer stem cells are formed by signalling cascades such as (i) Notch, (ii) Wnt, (iii) PI3K/AKT/mTOR, (iv) Bone morphogenetic proteins (BMP), (v) Hippo, (vi) TGF-β and (vii) Hedgehog (Chin & Lim, 2019; Song & Farzaneh, 2021). While the canonical and non-canonical Wnt pathways lead to the signal cascade in the tumour microenvironment leading to the epithelial mesenchymal transition (EMT), metastasizing, and maintenance of cancer stem cells, Notch signalling is critical for maintenance and differentiation of stem cells, which is important during the progression of the breast tumour (Kontomanolis et al., 2018) (Patel et al., 2019; Pohl et al., 2017; X. Xu et al., 2020).

EMT is required for proper embryonic development, yet it has a negative impact on cancer growth and metastasis (Plygawko et al., 2020; W & Y, 2019). Cell plasticity is necessary for the restoration of homeostasis following tissue injury, but it may also contribute to tumourigenesis if uncontrolled. (J & FR, 2017; W & Y, 2019). Zheng et al. suggested that EMT is involved in cancer stem cell (CSC) development.

Mature epithelial cells range from those with apicobasal polarity and nascent connections to those with fully differentiated cell-cell joints with specific apical features such as matched pairs borders and cilia throughout development (Plygawko et al., 2020). Intercellular junctions including proteins like E-cadherin and ZO-1 are often mediated by occludins, which provide a signalization platform between epithelial cells and a barrier necessary for the function of the tissue or use throughout during epithelial cell polarity after replacement (Ikenouchi et al., 2007).

There are five members of the miRNA-200 family, separated into two clusters and situated in two distinct genomic locations. The chromosome 1 is intergeneric in cluster I, miR-200b, -200a and -429 (miR-200b/200a/429), whereas the chromosome 12 is chromosome II, mir-200c and -141 (miR-200c/141) (Humphries & Yang, 2015). MiR-200 expression appears to regulate EMT in malignancies, with findings indicating an increase in tumour invasion and metastasis. The relevance of the miR-200 family in the plasticity of breast cancer remains unclear despite escalating interest. The mechanism of how miR-200 family expression affects the tumorigenesis and metastasis in breast cancer shall also be discussed.

Epithelial Mesenchymal Plasticity (EMP) in Stemness and Metastasis

Most breast cancer deaths are caused by metastasis, which can occur shortly after the original tumour develops or decades after it has been removed and adjuvant systemic therapy has been administered. (Tachtsidis et al., 2019). Metastases are one of the primary clinical issues responsible for most deaths worldwide. The detachment of cancer cells from the extracellular matrix at the initial tumour site and its migration and survival for several weeks leads to metastatic development. With cells losing epithelial connections, EMT can be complete or partial and can produce mesenchymal features (Tachtsidis et al., 2019). These cells can circulate through the circulation as a single cell or clusters. However, the findings stress the necessity to disseminate and generate new tumours through the connected axis of EMT, anoikis resistance and metabolic reprogramming in cells (LE & AL, 2018; Ranganathan et al., 2020).

EMT is a binary switch made up of cells that are either epithelial or mesenchymal (Ranganathan et al., 2020). Epithelial-mesenchymal plasticity (EMP), on the other hand, refers to the capacity to switch between epithelial and mesenchymal states. Cancer recurrence in the metastatic location is assumed to need the reverse process, known as mesenchymal to epithelial transition, after invasion and spread. (Bhatia et al., 2020). The reverse process, mesenchymal-epithelial transition (MET), has received less attention than EMT in the establishment of metastasis (Bhatia et al., 2020). Therefore, single-cell dispersion, made possible by EMT and followed by a MET, has long been thought to be a characteristic of metastasis (Jolly et al., 2017).

EMP in Breast Cancer Stem Cells

Stem cells of breast cancer are a smaller cell type with distinct molecular features such as CD44+/CD24-low (Garg, 2017; Kong et al., 2020). The phenotype CD44+/CD24 is associated with cancer development and likely to mediate metastasis (Ricardo et al., 2011; R. S et al., 2011). This lack of epigenetic regulation allows for more flexibility in transitioning between states and the occasional dedifferentiation event back to a CSC state, which is exceedingly unusual in normal tissue biology (Luo et al., 2015). These phenotypes have a low E-cadherin expression and high vimentin level that can be seen in triple negative breast cancer (TNBCs) (Luo et al., 2015).

Among basal-like breast cancers, triple negative breast cancer (TNBCs) has the most sub phenotypes. ALDH1 is a biomarker for both benign and malignant human breast tumours. ALDH1 levels over a certain threshold have been connected to poor prognostic variables such triple negative breast cancer (TNBC) (M et al., 2020). This high expression is employed as an independent prognostic marker in TNBC patients, predicting a poor prognosis (Lee et al., 2019). With high E-cadherin expression and low vimentin levels, this phenotype has the opposite features of CD44+/CD24-low. (Luo et al., 2015). Several studies have found that when mesenchymal tumour-initiating cells are converted into epithelial counterparts, their tumor-initiating ability is lost, implying that the dynamic interplay between EMP and stemness can lead to distinct cancer cell populations with distinct characteristics and activities in some circumstances (Kong et al., 2020).

Transcription Factors Modulating EMT

The transcription factors which modulate EMT comprise of Snail, SLUG, TWIST1, ZEB1, and ZEB2 (R. Xu et al., 2019). These transcription factors are present in multiple stages in the embryonic development (Stemmler et al., 2019). The core function of Snail is to attach to a CDH1 region e-component via its SNAG field, limiting CDH1 gene transcription (an epithelial marker). SLUG is a substance generated from SNAI2, which has a structure like Snail. The phosphorylation of Slug repressors by PAK4 and ERK2 promotes their activation. (R. Xu et al., 2019). Twist's activity and stability are controlled by phosphorylation. Twist stability has been shown to be improved by MAPK phosphorylation at Ser in breast cancer cells. Twist is exclusively phosphorylated at Ser by Akt, which suppresses Twist1-mediated E-cadherin production and promotes EMT (Kang et al., 2021; R. Xu et al., 2019). The active transcription activity of ZEB1 and ZEB2 increases the mesenchymal levels of vimentin and N-cadherin and inhibits their target genes, such epithelial markers (H.-T. Wu et al., 2020; R. Xu et al., 2019)(Li et al., 2017; SC et al., 2019).

EMP and the miR-200 Family

The miR-200 family serves as a tumour suppressor system in EMT by targeting ZEB (Mongroo & Rustgi, 2010; Title et al., 2018; Zaravinos, 2015). This is proven in an experiment that involved the ablation of miR-200 from a RT2 mice (Title et al., 2018) which resulted in an increase of tumour progression (Title et al., 2018). The intensity of EMT and miR-200 family expression is shown to be strongly correlated. In human meningiomas, MiR-200a was shown to be the most downregulated miRNA. MiR-200a restoration reduced ZEB1 and SIP1, resulting in enhanced E-cadherin expression, and was linked to a reduction in meningioma cell proliferation in culture and tumour development in vivo owing to caspase-mediated apoptosis (32). In human meningioma tumour tissues, miR-200a expression correlates inversely with β-catenin and one of its downstream targets, cyclin D1, suggesting a novel role for miR-200 in controlling EMT reversion through down-modulation of β -catenin/Wnt signalling and improved sensitivity to EGFR inhibitors and microtubule-targeting chemotherapeutic agents in aggressive drug-resistant cancers (Mongroo & Rustgi, 2010).

MiR-200b, on the other hand, is involved in metastasis suppression, especially in the suppression of triple negative breast cancer (TNBC) (LV et al., 2015). Loss of MiR-200b expression can EMT, which can make cancer cells more aggressive (MicroRNA 200a - an Overview | ScienceDirect Topics, n.d.). MiR-200c is also involved in EMT (K et al., 2013; Williams et al., 2021), whilst miR-141 inhibits the proliferation of osteosarcoma cell lines and promotes apoptosis, and it likely does so through ZEB1 and ZEB2 (MIR141 MicroRNA 141 [Homo Sapiens (Human)] - Gene - NCBI, n.d.). MiR-429, on the other hand, is regulated by p53 binding protein 1 to promote E-cadherin expression, suppress vimentin production, and prevent EMT. (Zhao et al., 2017).

Biogenesis and Function of miRNAs in Cancer and the Tumour Micro-Environment

RNA Polymerase II transcribes miRNA genes into long, 5′ capped and 3″ polyadenylated transcripts that are then processed into a complex microprocessor with Drosha, a nuclear RNase III enzyme (Hata & Kashima, 2016). The Exportin-5/Ran-GTP transports and transfers primary products, RNAs, known as precursor-miRNAs, in the cytoplasm, which catalyses secondary processing for miRNA-miRNA* duplexes in Dicer, another family RNase III enzyme, Dicer, TRBP and Argonaute proteins have a role in the processing of pre-miRNA and in creating the human silence complex triggered by RNA (Hata & Kashima, 2016) (Figure 1).

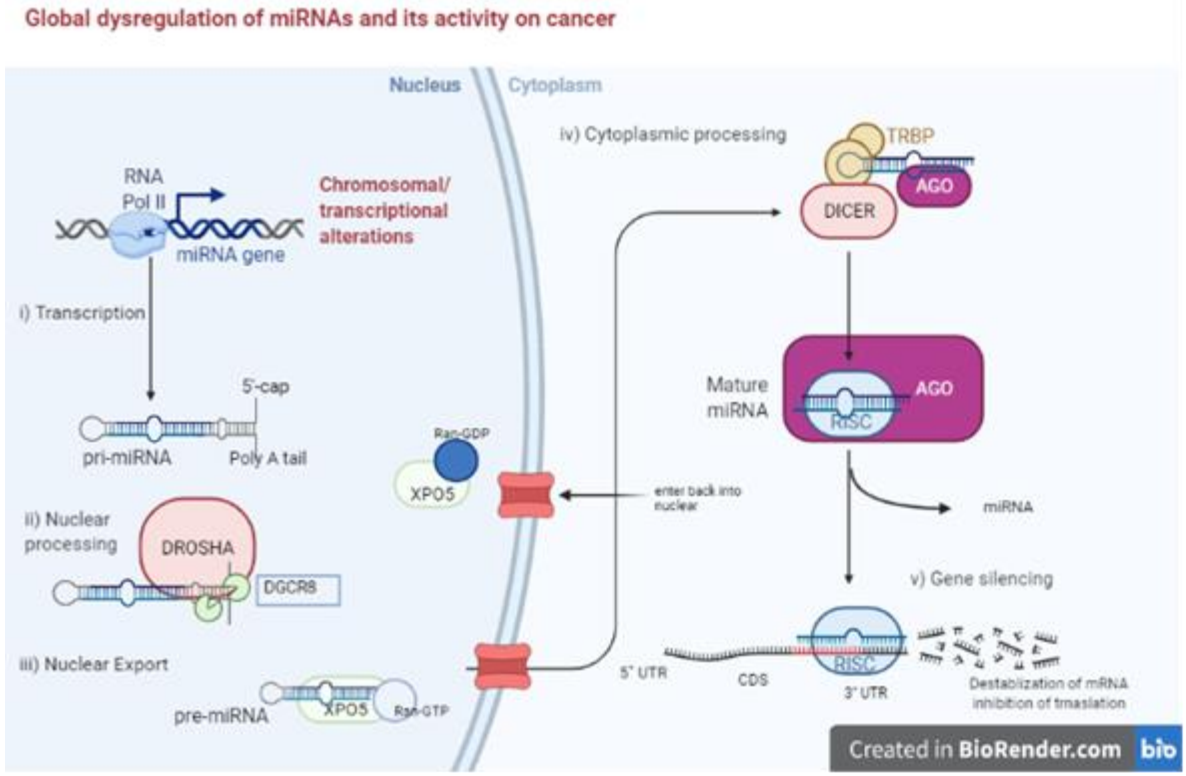

Figure 1: The miRNA biogenesis pathway
TRBP: transactivation-responsive RNA-binding protein; CDS: coding sequence, UTR: untranslated region; 5'-cap:50-7-Methylguanosine cap; poly A: polyadenylation.

The complex network of tumour microenvironments plays a crucial role in the promotion of the metastatic diffusion of breast carcinomas in many malignant or non-malignant cell types as well as in extracellular matrix (Hill et al., 2020; What Is the Tumor Microenvironment? | MD Anderson Cancer Center, n.d.). It comprises of malignant as well as non-cancer stem cells (Wang et al., 2020). Cancer-associated fibroblasts (CAF) and tumour-associated macrophages (TAM) are both involved in tumour growth in the tumour environment (T. L et al., 2017; Ping et al., 2021; Raskov et al., 2021; Sahai et al., 2020). CAF leads to a transition between the EMT, in which cells lose polarity and attachment and gain the motility to spread (Raskov et al., 2021); while a predictor of greater hematogenic metastasis and poor prognosis is TAMs, which are engaged in tumour cell infestation in breast cancer (Lin et al., 2019).

Destabilisation of miRNA Biogenesis in Cancer

MiRNAs are necessary for the effective regulation of cellular activities; the disruption causes aberrant cell growth and biosynthesis, which contributes to tumour formation, progression, and metastasis (Syeda et al., 2020). DROSHA, with its cofactor DGCR8, a class 2 ribonuclease ll enzyme creates a microprocessor, a heterotrimeric complex that processes an emerging pri-miRNA transcript framework flanked by a single-strand RNA segment (Hata & Kashima, 2016). The build-up of mis-cleaved pri-miRNA, as well as the total synthesis of pre-miRNA, can be influenced by abnormal pri-miRNA processing (Hata & Kashima, 2016).

Global suppression of the DICER1 depletion miRNA synthesis promote cell and tumourigenesis, which is proven in human cell lines of mice cancer (Gurtner et al., 2016; Syeda et al., 2020). MiRNA genes are translated into pre-miRNAs in cancer cells but not into mature miRNAs. Pre-miRNA nuclear export through XPO5 has been shown to be dysfunctional in human cancers (K. Wu et al., 2018). The modified XPO5 function may be caused by a change in XPO5 genetic or epigenetic, aberrant expression levels or PPMs in the XPO5 protein (Gurtner et al., 2016; K. Wu et al., 2018). The storage and transport of extracellular miRNAs was demonstrated to be the responsibility of Argonaute 2, coupled with GW182 (Cui et al., 2019). MiRNAs can be destabilised by the interaction of complementary target RNAs (JH et al., 2017). The major driving factor behind miRNA destabilisation is conformational changes in the Ago PAZ domain's hinge region (JH et al., 2017).

Epigenetic Regulation of miRNA Expression

Epigenetic regulation comprises of DNA methylation, RNA changes and post-translational histone modifications (Q et al., 2019a; Taufiqul Arif et al., 2020a). A miRNA biogenesis pathway could mediate DNA methylation (Glaich et al., 2019a; W. L et al., 2010; Q et al., 2019b). MeCP2, a gene attaching to the methylation miRNA DNA prevents elongation of RNA polymerase II, allowing Drosha to digest primary miRNAs easier and to enhance miRNA mature synthesis (Glaich et al., 2019b; Q et al., 2019b). Regulated miRNAs might be a sign of a critical feedback regulation mechanism. As previously revealed, miR-101 has been found in various malignancies and has been shown to have direct impacts on the epigenetic machinery (Morales et al., 2017; Taufiqul Arif et al., 2020b). HDAC1 and HDAC4 are two more significant direct epigenetic targets of miRNAs (Taufiqul Arif et al., 2020b). Several miRNAs are involved in DNA regulation and histone modifying enzymes which emphasise their relevance in genomic sustainability and epigenetic architecture development and preservation (Taufiqul Arif et al., 2020b).

Histone alterations are often linked to diseases and are considered to cause or contribute to the onset and/or progression of diseases. Silenced DNA regions, such as the inactive X chromosome in females or imprinted genes, are characterised by histone hypoacetylation and hypermethylation (Bianchi et al., 2017; Tao et al., 2017). Polycomb Repressive Complex 2 causes histone 3 lysine 27 to be trimethylated, resulting in gene silence at developmentally regulated sites. The lack of the restrictive mark H3K27me3 across the genome and the presence of H3K4me3 at transcription start sites keep chromatin primed in muscle stem cells, allowing cells to respond swiftly to external stimuli (Bianchi et al., 2017). Histone simulation works in tandem with HDACs to suppress gene transcription (Bianchi et al., 2017; Tao et al., 2017).

miRNA Dysregulation in Invasive Breast Cancer

TNBC is highly aggressive and fatal breast cancer with a poor prognosis due to lack of targeted therapy. However, it is now apparent that MiR-190a, milR-136-5p and miR-126-5p expression in triple negative breast cancer are considerably reduced (Ding et al., 2019; P. S et al., 2017). The Smad, p53, DEXH Box Helicase 9 (DHX9) RNA Helicase transcription factors are found to be associated with BRCA1 regulation, indicating that BRCA1 is a critical component in miRNA production, genome maintenance and processing of Let-7a-1, miR-145, and miR-145 (LD et al., 2019; P. S et al., 2017). Increased acetylation of miR200 by histone H3 has been found in translational repression by ZEB1 in the E-cadherin promoter, causing interruptions of repressive complexes between ZEB1 and HDAC and the inhibition of sirtuin 1 (SIRT1) (P. S et al., 2017).

Conclusion and Recommendations

Cases of carcinoma-related death are generally caused by tumour invasion and metastasis. EMT and tumour angiogenesis are known to be important stages in tumor invasion and metastasis, particularly in breast cancer. As a result, addressing these mechanisms through enhanced understanding of their associations with miRNA modulation may help restructure better treatment strategies. Future directions should aim to further evaluate the control and role of miR-200 family members in EMT, tumour angiogenesis, and metastasis of breast cancer subtypes such as TNBC.

Acknowledgement

This work was supported by the Fundamental Research Grant Scheme [FRGS/1/2016/SKK08/IMU/03/2] from the Ministry of Education, Malaysia. The authors would like to thank the authorities of International Medical University, Malaysia, for provision of necessary facilities in the preparation of this manuscript.

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Nigella sativa L. (black cumin): An *in silico* Study of Binding of Selected Phytochemicals to Mpro, the Main Protease of SARS-CoV-2

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Abstract - The current pandemic (COVID-19) caused by the zoonotic coronavirus SARS-CoV-2, since December 2019, has seriously disrupted the livelihoods of billions of people throughout the world, besides causing (as of September 25, 2021), 231,623,848 infections and 4,745,979 deaths. Several vaccines, which had received emergency approvals may not be fully effective against emerging viral mutants and are not getting equitably distributed amongst all countries. The only approved drug against this virus is Remdesivir, which is not only costly but only effective in some cases of COVID-19 infections and not all. The objective of this study was to find alternate drugs against COVID-19, which are more affordable and more efficacious for inhibition of SARS-CoV-2 and alleviation of its symptoms. We chose Nigella sativa seeds for their reportedly diverse pharmacological activities, some of which include antidiabetic, immunomodulator, analgesic, antimicrobial, anti-inflammatory, bronchodilator, renal protective, gastro-protective, and antioxidant properties. Randomly selected phytochemicals from seeds were evaluated through molecular docking (AutoDock Vina) for their binding affinities to the main protease Mpro of SARS-CoV-2, which plays a vital role in viral replication and is considered an excellent therapeutic target. Our studies indicate that several phytochemicals, namely nigellidine, quercitrin, amentoflavone, rutin, and chlorogenic acid have good binding affinities for Mpro with predicted binding energies of -7.7 to -9.6 kcal/mol. Apart from quercitrin, the other compounds interacted with one or both catalytic dyad amino acids His41 and Cys145 of Mpro. It is expected that the phytochemicals can play a major role as lead compounds in novel antiviral drugs against SARS-CoV-2.

Keywords - Nigella sativa, COVID-19, SARS-CoV-2, Amentoflavone, Rutin

Introduction

Coronaviruses (CoVs) belong to a family of enveloped, positive-sense single-stranded viruses, which belong to four genera, namely alpha, beta, gamma and delta (Zhu et al., 2020). The alpha and beta genera coronaviruses have the ability to crossover from animals to humans (zoonotic viruses) and can become human pathogens. Seven such human coronaviruses (hCoVs) have been reported as of the writing of this article. They are the beta-genera CoVs, namely Severe Acute Respiratory Syndrome coronavirus (SARS-CoV), Middle East Respiratory Syndrome CoV (MERS-CoV), Severe Acute Respiratory Syndrome CoV-2 (SARS-CoV-2), hCoV-HKU1, and hCoV-OC43 and the α-genera CoVs, which are hCoV-NL63 and hCoV-229E (Weiss, 2020; Coleman and Freeman, 2014; Zhu et al., 2020). Apart from SARS-CoV, MERS-CoV, and SARS-CoV-2, the other hCoVs cause only mild respiratory and gastrointestinal infections in humans; however, SARS-CoV, MERS-CoV, and SARS-CoV-2 can be highly lethal and pathogenic, causing lower respiratory tract infections, which in turn may lead to acute respiratory distress syndrome or ARDS (Acosta & Singer, 2020; Meo et al., 2020).

The emergence of the highly pathogenic CoVs was initiated in November 2002 when SARS was reported from Foshan, China. SARS was followed by MERS, the most lethal of the CoVs, which was first reported from Jordan in April 2012. The last of the CoVs, namely SARS-CoV-2 was first reported from Wuhan, China in late December, 2019 (Zhong et al., 2003; Hijawi et al., 2013; Khan et al., 2020). Bats appear to be the primary reservoir of SARS, MERS, and SARS-CoV-2; SARS seem to have transmitted from bats to humans through palm civet cats as the intermediary host. In the case of MERS, the intermediary host is reportedly dromedary camels. The intermediary host of SARS-CoV-2 is still debated with pangolins being the most likely candidate (Zhu et al., 2020).

SARS and MERS disappeared following an initial bout of infections, which did not result in a pandemic. The situation, however, is totally different with SARS-CoV-2, which has caused a pandemic and disrupted human lives and the economy throughout practically every country in the world in a manner not seen in over the last 100 years. As of November 21, 2021 SARS-CoV-2 has caused 257,663,462 infections and 5,166,671 deaths worldwide (https://www.worldometers.info/coronavirus/). The disease caused by the virus, COVID-19, shows no signs of abating but is flaring up in countries and continents with the arrival of newer viral mutants or 'variants of concern'; the latest resurgence in viral episodes has been attributed to the delta variant of the virus, which reportedly spreads twice as quickly than the original SARS-CoV-2 Wuhan strain (Lauring & Malani, 2021).

SARS and MERS ended without the discovery of a vaccine or drug against them. Since SARS-CoV-2 has been continuing for a long period with mounting loss of human lives and disruption of the global economy, scientists have been putting intensive efforts towards discovering viable vaccines and drugs against the virus. As reviewed by Abdulla et al (2021), there are currently 14 vaccines, which have obtained emergency approvals or are undergoing advanced Phase 3 clinical trials worldwide. COVID-19 vaccination drive started faltering almost from the start because of several factors – disapproval from a certain section of the population about receiving vaccines prepared from new technology and other factors, the loss of at least partial efficacy of the vaccines with time and against SARS-CoV-2 new variants, and last but not the least, the global inequality about the distribution of vaccines with rich countries building up stockpiles against the poorer countries receiving next to nothing at all (Tatar et al., 2021).

Search for drugs against COVID-19 have been less successful than vaccines. From an array of synthetic antiviral and repurposed drugs, remdesivir got the approval from the United States Food and Drug Administration (USFDA) for Emergency Use Authorization (EUA) in hospitalized COVID-19 patients only (Beigel et al., 2020). However, the cost of remdesivir is a factor, which may prevent its use in the low income countries (LICs) and low middle income countries (LMICs) of the world. Gilead Sciences, the manufacturer of this drug, has fixed the unit cost of remdesivir in USA at $520 a vial, which brings the total cost of treatment to $3120 per patient (https://www.ajmc.com/view/gilead-sciences-sets-us-price-for-covid19-drug-at-2340-to-3120-based-on-insurance). In a LMIC like Bangladesh, the price of remdesivir has been fixed at $59-71 per vial, bringing the treatment cost from $295 to $781 per patient depending on the number of vials needed to treat the patient (https://www.reuters.com/article/us-health-coronavirus-bangladesh-remdesi-idINKBN22H1DD). Another drug, molnupiravir from Merck has very recently obtained the USFDA approval. In Bangladesh, each vial will cost around $0.82, with the total treatment cost at $32.94 for the drug only (https://www.tbsnews.net/bangladesh/health/eskayef-square-get-dgda-approval-produce-covid-19-drug-molnupiravir-327271). On the other hand, the per capita income for Bangladesh was $2,227 in the 2020-2021 fiscal year (https://www.thedailystar.net/business/news/capita-income-bangladesh-rises-2227-2145696). The data strongly indicates that such antiviral drugs cannot be afforded by the general population in the developing world. Thus, there is a definite need for more affordable and available drugs.

The primary symptoms of COVID-19 include fever, cough, difficulty breathing, sore throat, tiredness, aches, nasal congestion, headache, diarrhea, vomiting and the occasional loss of smell and taste (Hassan et al., 2020). Because of the necessity for having easily available and affordable drugs, rural people have taken to traditional medicines and home remedies with plants forming the primary basis of treatment. These home remedies are mostly used for symptomatic treatment of COVID-19 (Azam et al., 2020; Orisakwe et al., 2020); any virucidal effect of the remedy is purely coincidental, because rural people are neither cognizant nor possess appropriate lab facilities for antiviral testing. The World Health Organization (WHO) has also endorsed the use of traditional medicines against COVID-19 or its symptoms and comorbidities provided there is scientific basis for their use (WHO Africa, 2020). Scientists have taken a slightly different approach. Because there is a scarcity of COVID-19 experimental laboratories, particularly in developing countries, and because in vitro and in vivo testing is costly, there has been a multitude of in silico studies with both phytochemicals and synthetic compounds. Most such screening studies have involved looking at binding energies (using molecular docking techniques) against various SARS-CoV-2 targets or the human receptor of SARS-CoV-2, namely human Angiotensin Converting Enzyme 2 (hACE2) complexed with the spike protein receptor binding domain (S-RBD) of SARS-CoV-2 (Wu et al., 2020; Basu et al., 2020). The main protease, Mpro of SARS-CoV-2 (also known as 3CLpro) forms a primary therapeutic target in molecular docking studies because it is an essential enzyme for viral replication (Suárez and Díaz, 2020; Ibezim et al., 2021).

Nigella sativa L. (Ranunculaceae) is a medicinal herb, which grows in the Middle East, Eastern Europe and West Asian countries. The plant is known as black cumin in English, kali jeera in Bengali, and Al-Habba in Arabic. Seeds of the plant are the most used part and are used in traditional medicinal systems in various gastrointestinal disorders, asthma, bronchitis, rheumatism, paralysis, hypertension, inflammation, intermittent fevers, hepatic disorders, skin disorders, and helminthiasis (Gilani et al., 2004; Hannan et al., 2021). Among the pharmacological actions of Nigella sativa reviewed by Hannan et al. (2021) are "antioxidant effects, anti-inflammatory effects, immunomodulatory effects, protection against neurological disorders, protection against neuroinflammation, protection against Alzheimer's and Parkinson's diseases, protection against ischemic stroke and traumatic brain injury, protection against anxiety, depression, epilepsy, schizophrenia, and other miscellaneous neurological problems, anti-cancer, anti-obesity, antidyslipidemic, antidiabetic, cardioprotective, antihypertensive, hepatoprotective, pulmonary protective, gastroprotective, protection against skin diseases, fertility inducing, nephroprotective, anti-arthritic, antiviral, antidote, and galactagogue. The plant and the seeds contain a variety of phytochemicals, which can be broadly divided into terpenes and terpenoids, phytosterols, alkaloids, tocols and polyphenols. Two different types of alkaloids are found in seeds: isoquinoline type of alkaloids like nigellicimine and nigellicimine n-oxide, and pyrazol alkaloids like nigellidine and nigellicine (Forouzanfar et al., 2014).

The objective of this study was to evaluate in silico, alternate drugs (phytochemicals) against COVID-19, which are more affordable and more efficacious for inhibition of SARS-CoV-2 and alleviation of its symptoms. We chose Nigella sativa seeds for their reportedly diverse pharmacological activities and a long history of their uses in traditional medicines of various countries.

Methodology

Molecular docking

The pdb file (6LU7) of Mpro of SARS-CoV-2 3C-like protease (Liu et al., 2020) was used in the present study. The pdb file, as maintained in the data bank, contained Mpro bound to an inhibitor N3; the inhibitor was removed prior to using Mpro in our molecular docking studies. The interacting residues of N3 with the protease are His41, Met49, Phe140, Leu141, Asn142, Gly143, His163, His164, Glu166, Leu167, Pro168, Gln189, Thr190, and Ala191. The active residues at the catalytic site of the 3C-like proteases of SARS-CoV-2 are His41 and Cys145. All water molecules, ions, and ligands were removed from the protein molecule using PyMOL software. The monomeric form of the protease was used for molecular docking (Zhavoronkov et al., 2020).

Thirteen randomly selected phytochemicals (alkaloids and phenolic compounds) from seeds (Ahmad et al., 2013) were evaluated through blind molecular docking (AutoDock Vina) for their binding affinities to the main protease Mpro of SARS-CoV-2. Ligand molecules downloaded from Pubchem (Ihlenfeldt, 2018) in sdf format were optimized with the force field type MMFF94 using Openbable software and saved as pdbqt format.

Ligand binding to Mpro was carried out as described before (Trott & Olson, 2010). The predicted binding affinity values are an average of values from five independent runs of the docking program. The various figures show the docked pose of phytochemicals bound to SARS-CoV-2 main protease (Mpro) as obtained from PyMOL and displayed in Discovery Studio (Studio D, 2015).

Lipinski's Rule of 5 (Ro5)

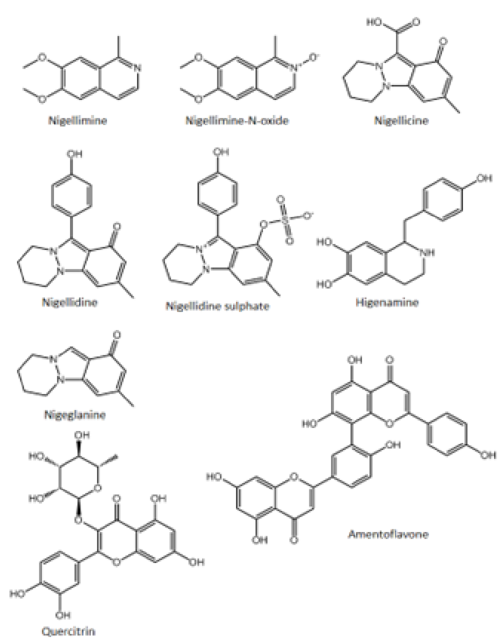
Lipinski's Rule of 5 (Giménez et al., 2010; Rakib et al., 2020) was followed to determine the drug like properties of the phytoconstituents of Nigella sativa in the present work.

Results and Discussions

In silico studies have become one of the powerful and frequently used tools for computer-aided drug discovery. A preliminary screening utilizing one or more of the various techniques of molecular docking between a ligand and the target protein can save time and reduce costs, which are vital items in normal times and more so during pandemics. Molecular docking techniques can be utilized to characterize the binding interactions between a small molecule and a protein at the atomic level. In the present instance, we have used blind molecular docking, which method does not make any pre-assumption on the binding site on the protein by the ligand (Meng et al., 2011). Blind molecular docking was also the method used to identify potential inhibitors of SARS-CoV-2 Mpro in a recent study published in 2021 (Das et al., 2021).

A total of thirteen phytochemicals (alkaloids and polyphenols) reported to be present in Nigella sativa seeds were evaluated in the present in silico study utilizing AutoDock Vina molecular docking techniques. The structures of the various phytochemicals are shown in Figure 1. Among the alkaloids, only nigellidine demonstrated good binding affinity for Mpro with a predicted binding energy (ΔG) of -7.8 kcal/mol. On the other hand, with the exception of kaempferol and ferulic acid, the other flavonoids and polyphenols showed predicted binding energies with Mpro, ranging from -7.7 to -9.6 kcal/mol. The results are shown in Table 1. Among the compounds, amentoflavone showed the highest predicted binding energy of -9.6 kcal/mol in contrast to the antiviral control drug nelfinavir with a predicted binding energy of -8.1 kcal/mol. From the structures of the compounds, it appears that phenolic groups increase the binding affinity of a compound to Mpro, and as such, polyphenolic compounds can be potential therapeutics against SARS-CoV-2. Similar observations have been reported previously (Ghosh et al., 2021; Nguyen et al., 2021).

Table 1 also shows that of the five compounds that were further evaluated for their non-bonded interactions with Mpro amino acid residues, apart from quercitrin, the other four phytochemicals (nigellidine, amentoflavone, rutin and chlorogenic acid) showed non-bonded interactions with one or both amino acid residues forming the catalytic dyad of Mpro, namely His41 and Cys145. In addition, the repurposed anti-human immunodeficiency virus (anti-HIV) protease inhibitor drug, nelfinavir, also showed binding to Cys145 of Mpro (Table 1). The results are consistent with our hypotheses that these phytochemicals can be potentially good inhibitors of SARS-CoV-2 replication through inhibiting Mpro. The structure analysis of Mpro has demonstrated that the protease monomer contains three domains; domain I comprises amino acid residues 8-101, domain II comprises amino acid residues 102-184, and domain III comprises amino acid residues 201-303. Domain III helps in the dimerization of Mpro, which is necessary for its catalytic activity (Mengist et al., 2021). In that case, the binding of quercitrin to Domain III amino acid residues of Mpro (Table 1) can potentially inhibit Mpro dimerization and catalytic activity.



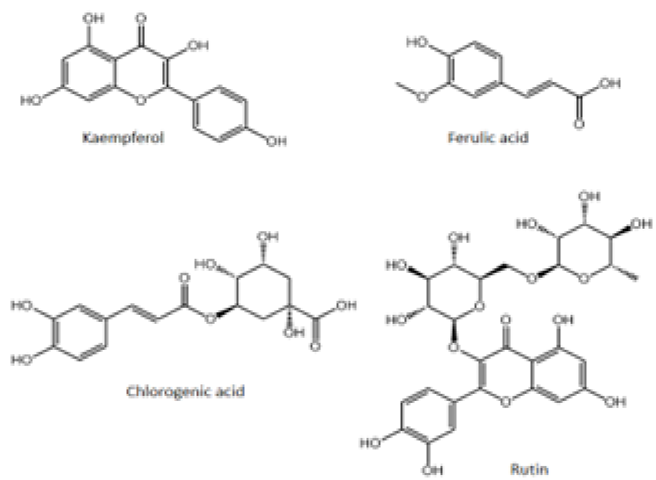


Figure 1. Structure of the phytochemicals

Table 1. Binding energies and non-bonded interactions of selected ligands with Mpro amino acid residues.

Phytochemicals	Binding energy (ΔG = kcal/mol)	Non-bonded interaction of ligands with amino acid residues of Mpro	
		Residues	Bond type
Nigellimine	-5.7		
Nigellimine-N-oxide	-5.7		
Nigellicine	-6.6		
Nigellidine	-7.8	THR190	Conventional Hydrogen Bond
		GLU166	Pi-Donor Hydrogen Bond
		MET165	Pi-Sulfur
		MET165	Alkyl
		HIS41	Pi-Alkyl
Nigellidine sulphate	-7.8		
Higenamine	-6.4		
Nigeglanine	-5.7		
Quercitrin	-7.8	THR199	Conventional Hydrogen Bond
		ASN238	Conventional Hydrogen Bond
		ASP289	Conventional Hydrogen Bond
		ASN238	Conventional Hydrogen Bond
		LEU272	Conventional Hydrogen Bond
		LEU272	Pi-Alkyl
Amentoflavone	-9.6	HIS163	Conventional Hydrogen Bond
		ASN142	Conventional Hydrogen Bond
		GLY143	Pi-Donor Hydrogen Bond
		GLU166	Pi-Donor Hydrogen Bond
		CYS145	Pi-Sulfur
		HIS41	Pi-Pi T-shaped
		CYS145	Pi-Alkyl
		MET165	Pi-Alkyl

		MET165	Pi-Alkyl
Kaempferol	-7.0		
Rutin	-8.8	HIS41	Conventional Hydrogen Bond
		ASN142	Conventional Hydrogen Bond
		GLY143	Conventional Hydrogen Bond
		CYS145	Conventional Hydrogen Bond
		GLU166	Conventional Hydrogen Bond
		PHE140	Conventional Hydrogen Bond
		THR190	Conventional Hydrogen Bond
		THR26	Conventional Hydrogen Bond
		CYS145	Pi-Sulfur
		MET165	Pi-Sulfur
Ferulic acid	-6.1		
Chlorogenic acid	-7.7	THR26	Conventional Hydrogen Bond
		HIS41	Conventional Hydrogen Bond
		HIS163	Conventional Hydrogen Bond
		LEU141	Conventional Hydrogen Bond
		GLU166	Conventional Hydrogen Bond
Nelfinavir	-8.1	ASN142	Conventional Hydrogen Bond
		LEU141	Conventional Hydrogen Bond
		CYS145	Pi-Sulfur
		LEU27	Alkyl
		CYS145	Alkyl

The 2D interactions of amentoflavone, nigellidine, and rutin with Mpro are shown in Figures 2-4, respectively. These three compounds were chosen because of their high affinities for Mpro. Figure 2 shows that amentoflavone interacts with Mpro amino acid residues His41, Asn142, Gly143, Cys145, His163, Met165, and Glu166. It may be noted that the interacting amino acid residues of Mpro with the inhibitor N3 were His41, Met49, Phe140, Leu141, Asn142, Gly143, His163, His164, Glu166, Leu167, Pro168, Gln189, Thr190, and Ala191. Thus, besides one of the catalytic dyad amino acid residues His41, common amino acid residues of Mpro interacting with N3 and amentoflavone are Asn142, Gly143, His163 and Glu166. Figure 3 shows that the Mpro amino acid residues interacting with nigellidine are His41, Met165, Glu166 and Thr190. Three of the four amino acid residues of Mpro interacting with nigellidine are similar to N3 inhibitor. Figure 3 shows that rutin interacts with Mpro amino acid residues Thr26, His41, Phe140, Asn142, Gly143, Cys145, Met165, Glu166 and Thr190. Thus, six amino acid residues were the same between rutin and N3 in their interactions with Mpro. The 2D interactions of the phytochemicals further points to their potential to interact and inhibit Mpro.

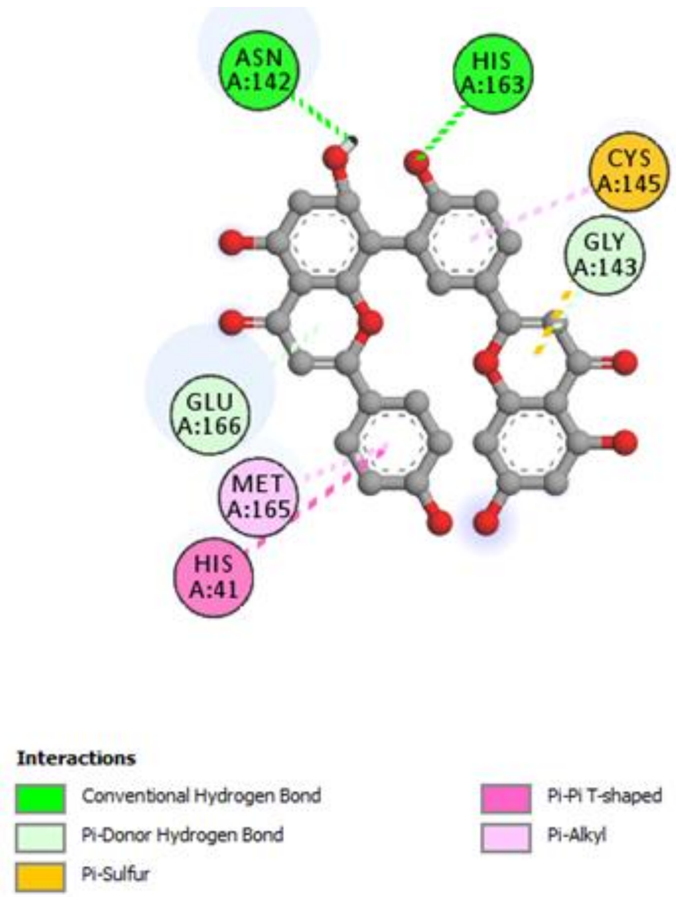


Figure 2. 2D interaction of amentoflavone with Mpro.

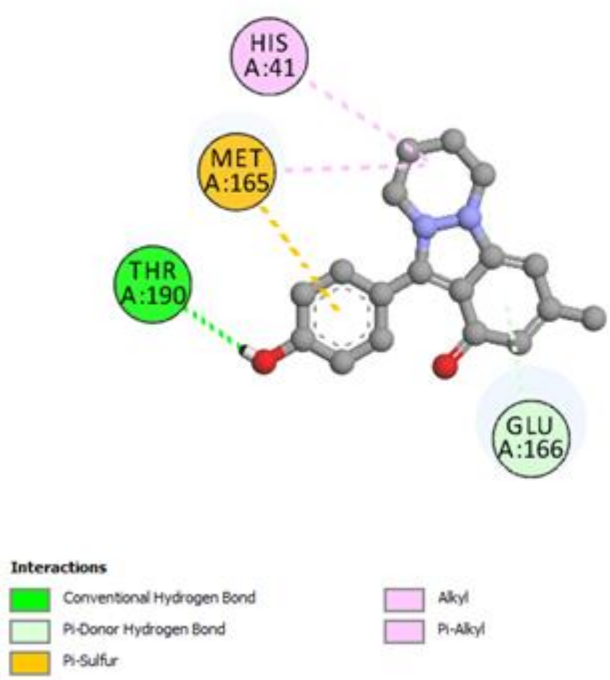


Figure 3. 2D interaction of nigellidine with Mpro.

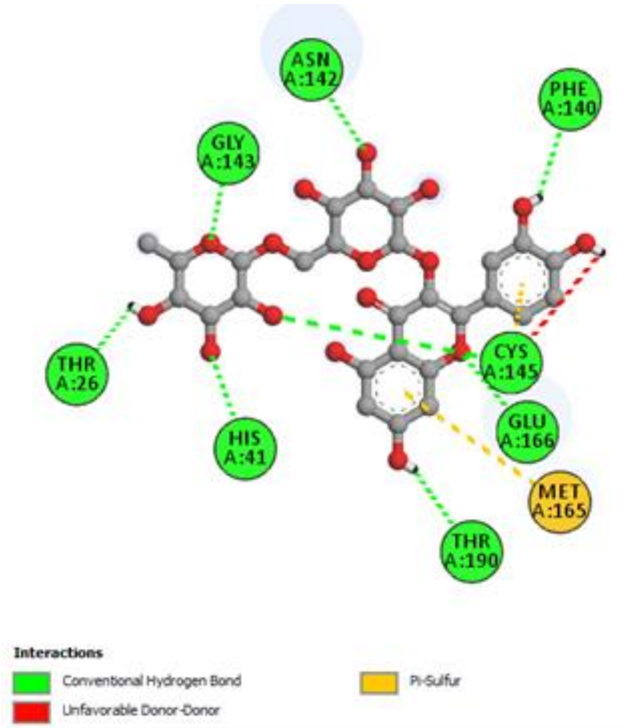


Figure 4. 2D interaction of rutin with Mpro.

Several studies have previously been conducted with Nigella sativa and SARS-CoV-2 protein components. Molecular docking studies carried out with Lenovo ThinkPad between Mpro and phytochemicals of Nigella sativa showed good binding affinities of □-hederin, Stigmasterol glucoside, Nigellidine-4-O-sulfite, Nigellidine, Sterol-3-β-D-glucoside, Dithymoquinone, and □-sitosterol with Mpro (Khan et al., 2021). A review study has indicated that at least there are eight in silico studies conducted on binding of Nigella sativa phytochemicals to various component proteins of SARS-CoV-2 (Koshak and Koshak, 2020). The present study represents an advancement of previous works with new findings of previously not reported phytochemicals of Nigella sativa having high binding affinities for SARS-CoV-2 Mpro.

Lipinski' Rule of 5 (Ro5) was used to determine the potential of the Nigella sativa phytochemicals as possible drugs. The results are shown in Table 2. The rule states that "molecules, which are poorly absorbed by intestinal wall (that is oral bioavailability is not good) would present any two or more of these characteristics: molecular weight more than 500, lipophilicity (log P >5), hydrogen-bond (HB) donor groups (expressed as the sum of OHs and NHs groups) more than 5, more than 10 HB acceptor groups (expressed as the sum of Os and Ns atoms), and molar refractivity outside a range of 40-130. However, Lipinski's rule has its violations and it may be mentioned that a number of drugs (like artovastatin and montelucast) have more than two violations of the rule (Giménez et al., 2010). In the present instance, the two high binding affinity phytochemicals of Nigella sativa for Mpro, namely amentoflavone and rutin, had 2 and 3 violations, respectively, of Lipinski's rules. Among other phytochemicals with high binding affinity for Mpro, chlorgenic acid and quercitrin had one violation each, while nigellidine showed zero violations.

Table 2. Lipinski's Ro5 data for the phytochemicals of Nigella sativa.

Phytochemicals	Molecular weight	Number of H-Bond Acceptors	Number of H-Bond Donors	Log P	Molar Refractivity	No. of Violation(s)
Nigellimine	203.24	3	0	2.38	59.69	0
Nigellimine-N-oxide	219.24	3	0	1.90	63.06	0
Nigellicine	246.26	3	1	1.71	68.15	0
Nigellidine	294.35	2	1	2.57	88.65	0
Nigellidine sulphate	374.41	5	1	-1.90	97.09	0
Higenamine	271.31	4	4	1.84	81.15	0
Nigeglanine	202.25	1	0	2.26	61.19	0
Quercitrin	448.38	11	7	1.27	109.00	2
Amentoflavone	538.46	10	6	3.06	146.97	2
Kaempferol	286.24	6	4	1.70	76.01	0
Rutin	610.52	16	10	2.43	141.38	3
Ferulic acid	194.18	4	2	1.62	51.63	0
Chlorogenic acid	354.31	9	6	0.96	83.50	1

It was of interest to check the scientific literature for antiviral properties of the five high binding affinity phytochemicals of Nigella sativa, namely nigellidine, quercitrin, amentoflavone, rutin, and chlorogenic acid. In in silico studies, nigellidine showed active site molecular docking with nucleocapsid-NSP2-Mpro of COVID-19 and to human IL1R- IL6R (Maiti et al., 2020). The inhibitory effect of quercetin 3-rhamnoside (quercitrin) has been reported for influenza A virus replication (Choi et al., 2009). Quercetin, in combination with quercitrin, reportedly inhibited dengue virus 2 (DENV2) (Chiow et al., 2016). One of the antiviral components isolated in water extract of Eupatorium fortunei Turcz. (Asteraceae) active against influenza A virus, Newcastle disease virus, and vesicular stomatitis virus has been identified as quercitrin (Choi et al., 2017).

The antiviral effects of chlorogenic acid (CA) have been previously reported. For instance, Lonicera japonica Thunb., which is rich in CA, is used in China to treat influenza virus, parainfluenza virus, and respiratory syncytial virus (Ding et al., 2017). Anti-hepatitis B virus activity of CA has also been shown in vitro and in vivo experiments by Wang et al. (2009). CA also has been found to inhibit the replication and viability of enterovirus 71 in vitro (Li et al., 2013). During preliminary molecular docking studies for active compounds in traditional Mongolian medicine for anti-COVID-19 drugs, CA was found to inhibit effectively the binding of Spike (S) protein of SARS-CoV-2 with its receptor ACE2 (Yu et al., 2020). In silico studies have further shown that CA is a potential inhibitor of COVID-19 with multiple targets including ACE receptor (Wang et al., 2021).

Amentoflavone from ethanol extract of Selaginella sinensis P. Beauv. (Selaginellaceae) reportedly showed potent antiviral activity against respiratory syncytial virus (Shuang-Cheng et al., 2001). A recent review has pointed out that amentoflavone has significant antiviral activities against influenza A and B viruses, herpes simplex virus 1 and 2 (HSV1, HSV2), and against the reverse transcriptase of human immunodeficiency virus, HIV-1; amentoflavone also has inhibitory effects on drug-resistant variants of HSV1 and hepatitis C virus and can inhibit Coxsackie virus replication. The compound has been mentioned as a possible adjuvant therapy for COVID-19 (Singh, 2021). Amentoflavone, in in silico studies showed strong interactions with Mpro of SARS-CoV-2 and human transmembrane protease serine 2 (TMPRSS-2) proteins demonstrating its potential as an anti-COVID-19 drug (Hossain et al., 2021). Rutin is reportedly a low micromolar inhibitor of SARS-CoV-2 Mpro; it is a glycosylated conjugate of quercetin, which leads to its increased in vivo bioavailability than quercetin, the latter being a potent in vitro inhibitor of Mpro (Rizzuti et al., 2021). Taken together, a number of the phytochemicals of Nigella sativa can be strong inhibitors of SARS-CoV-2 replication through inhibition of Mpro.

Conclusion and Recommendations

Nigella sativa and more particularly its seeds have been considered to possess important medicinal properties in various traditional medicinal systems ranging from West Asia to East Europe and including the Middle Eastern countries. Modern scientific research has confirmed that the pharmacological properties of the plant and the seeds include beneficial effects in hypertension, cardiovascular disorders, diabetes, and cancer. Ongoing scientific research suggests that phytoconstituents of the plant may have strong binding potential and consequential inhibitory activities on a number of protein components of SARS-CoV-2 (the causative agent of the disease COVID-19 and the current pandemic), which are responsible for viral entry into human cells and viral replication. In the present study, we add to the current state of our knowledge by showing that several new and previously unreported phytocomponents of Nigella sativa have high binding affinities for the main protease Mpro of SARS-CoV-2, the binding and consequent inhibition of which can stop viral replication. The next phase of the study will be to determine the actual SARS-CoV-2 inhibitory potential of these phytoconstituents in in vivo and in vitro experiments.

Acknowledgement

The authors are grateful to Drs. Veeranoot Nissapatorn and Maria de Lourdes Pereira for their helpful comments on the manuscript.

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Evaluation of the Antimicrobial Activity of American Cockroach (periplaneta americana) Ethanolic Tissue Extract Against Selected Enteric Bacteria

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Abstract - Gastrointestinal (GI) tract disorders caused by pathogenic bacteria highly contribute to the increase of deaths worldwide. This problem catalyzed the search for metabolites from various organisms that may exhibit antimicrobial effects against bacterial pathogens. In this study, the common household cockroach (Periplaneta americana) was tested to target selected enteric bacteria using the Kirby-Bauer Disc Diffusion method. The results show that the ethanolic extract of P. americana exhibited antimicrobial effects against test pathogens with the highest inhibitory effects against Vibrio parahaemolyticus (p = 0.00013), and Candida albicans (p = 0.000911) as compared to the antibiotic controls, Rifampicin, Trimethoprim, Ofloxacin, Penicillin and Nystatin. However, no inhibitory activities were noted against Enterococcus faecalis Salmonella enteritidis, and Serratia marcescens Hence, the present findings revealed the potential antimicrobial use of Periplaneta americana tissue extract against medically important pathogens.

Keywords - Natural product, antimicrobial, Periplaneta americana, enteric bacteria, ethanolic tissue extract

Introduction

Gastrointestinal (GI) tract illnesses contribute significantly to the burden of illnesses from infectious diseases worldwide (Ellis, 2013). Annually, an estimated 1.5 billion episodes of diarrheal complications result in deaths of approximately 2.2 million people; mostly are children occur in developing countries (Mandeville et al., 2009). GI tract disorders may range from mild to serious and may dysfunction the digestive system, as well as the overall human health. Lifestyle and sanitation play a crucial role in digestive health. Food intake could influence digestive upsets while unclean dining preparation or other unhygienic activities may lead to the transmission of potentially dangerous bacteria among the food leading to gastrointestinal diseases (Sousa, 2008).

The current treatments for GI tract disorders are primarily symptom-based and marginally effective for only certain subgroups but do not specifically target the causes of pain (Thiwan, and Drossman, 2006). Furthermore, nonsteroidal anti-inflammatory drugs (NSAID) are commonly used as relief for GI tract disorders (Soleimanpour et al., 2016). However, these drugs are found to cause lichen planus in the mouth, esophageal inflammation and strictures, and small bowel and colonic ulcers and strictures (Makins, R., Ballinger, A., 2003) when given in high doses and for a prolonged time of treatment. While probiotic treatments are also introduced to combat GI tract diseases, thru the intake of live microorganism that are capable of surviving in the GI tract and induce a beneficial effect in the host, are presented as another form of therapy with potential efficacy in treating FGIDs, particularly Irregular bowel Syndrome (IBS) (Whitfield and Shulman, 2009). In this treatment, probiotics competes metabolically with pathogens, thus may lead to improvements of the mucosal barrier as well as ability to alter the intestinal inflammatory responses (Pickard et al., 2018). Even so, the efficiency of this biological therapy continues to be uncertain.

In relation to this, this paper aims to provide a novel source that may target GI tract disorders relative to its profile- the Periplaneta america. P. americana is a synanthropic pest that mainly inhabits cosmopolitan to urban areas and survives in warm weather with high moisture conditions (Kim et al., 2016). Locally, American cockroach is widespread in selected areas of Metro Manila (Carillo et al., 2016). Given their ecological roles and habitat, cockroaches are always exposed to potentially pathogenic microorganisms and parasites, but only a few encounters result in infection (Basseri, et al., 2016), with at least 22 species of pathogenic human bacteria, viruses, fungi, protozoans, and five species of helminthic worms have been isolated from this species (Babara, 2014). These facts emit the idea that the P. americana could be a possible source of antibiotics due to their ability to combat these microorganisms. Considered as the largest peridomestic roach species, P. americana is also labeled as a probable vector of pathogens, yet, cockroaches have recently been found to harbor potentially beneficial and medically useful substances such as drugs and allergens (Kim et al.,2016). Also, P. americana has been studied in recent years for its significance in neurobiological purposes, especially in electrophysiology, which plays a vital role in most research activity in toxicology (Dabrowski et al., 2012). Meanwhile, an antibiotic assay using 61kDa protein isolated and purified from P. americana's hemolymph conducted by Seraj et al., (2003), resulted in an interesting potential for therapeutic application because of its activity against several bacterial strains at very low concentrations as compared to conventional antibiotics. Similarly, cockroach brain crude lysates exhibit potent bacterial activity against MRSA and neuropathogenic E. coli K1 (Ali et al., 2017).

To contribute to the investigation for new sources of antimicrobials, the researchers aimed to generate an innovative means to combat GI tract infectious agents through evaluation of the antimicrobial activity of Periplaneta americana (American cockroach) tissue extract as a potential response to the far-reaching complications of GI tract disorders worldwide. A local report from the Department of Health (DOH) stating a 19.20% increase of bloody diarrheal cases from 2016 to 2017. Moreover, inside the digestive system, a complex ecosystem of intestinal microflora containing 400 microbial species is present that aid and conjoin to support GI tract activities (Gorbact, 1996). Nonetheless, there are enterotoxigenic bacteria that could enter the system and produce enterotoxins affecting different areas of GI tract: three of these bacteria are the target organisms of this research: Enterococcus faecalis- a challenging gram-positive bacterium that causes infections that are difficult to treat because of drug resistance of my E. faecalis isolates (Kau et al.,2004); Salmonella enteritidis and Vibrio parahaemolyticus both gram-negative bacteria, in a study prepared by Anup et al., (2018); S. enteritidis isolated from raw, frozen, and stuffed chicken entrees were resistant to ampicillin and tetracycline; V. parahaemolyticus showed resistance against ampicillin and streptomycin (Lopek et al., 2018). The alarming resistance of these organisms could create a dilemma in the future. Hence the need to address this condition is important. In the Philippines, an administrative order was mandated to promote an action plan against antimicrobial resistance; the Administrative Order no. 42 series of 2014, creating an inter-agency committee for the formulation and implementation of the national plan to combat antimicrobial resistance in the country (Carlos, 2016). In the research regarding this matter, two pathogenic enteric bacteria were to proven to be resistant: Escherichia coli and Non-typhoidal Salmonella species. These problems need to be addressed thru research, since many of these diseases are difficult to diagnose and their symptoms are not effectively managed, and the development of novel therapeutics is urgently needed (Greenwood-Van et al., 2017).

Methodology

Collection and Preparation of the Sample

Live adult P. americana species were collected from four different areas of Metro, Manila, the Philippine; Brgy. Concepcion Uno, Marikina City (14. 6507° N, 121.1029° E), Brgy. Punturin, Valenzuela City (14° 44' 13.3260 N, 121 0' 8.5968" E), and Brgy. Addition Hills, Mandaluyong City, Rev. G. Aglipay, Mandaluyong City (14° 35 35. 2903' N, 121° 1.4606 E).

Figure 1: Map of sampling area, Metro Manila, Philippines. A. Brgy. Concepcion Uno, Marikina City (14. 6507° N, 121.1029° E), B. Brgy. Punturin, Valenzuela City (14° 44' 13.3260 N, 121 0' 8.5968" E), and C. Brgy. Addition Hills, Mandaluyong City, Rev. G. Aglipay, Mandaluyong City (14° 35 35. 2903' N, 121° 1.4606 E). Photo from Google. (n.d.).

A total of 160 pieces of P. americana samples were captured and kept in a glass container before euthanasia; head, pronotum, tegmina, hind wings, legs and anal cerci were removed from each sample. On the other hand, active cultures of bacterial strains were issued by the Center of Life Sciences Research of Polytechnic University of the Philippines (PUP), a culture collection affiliate of the National Institute of Molecular Biology and Applied Microbiology (BIOTECH)- University of the Philippines Los-Baños (UPLB), Laguna, Philippines. The target bacterial strains with their designated accession numbers are showed in Table 1.

Table 1. List of pathogenic strains used in the experiment.

Bacterial Strain	Accession Number
Enteroccus faecalis (+)	BIOTECH 10348
Salmonella enteritidis (-)	BIOTECH 1963
Vibrio parahaemolyticus (-)	BIOTECH 10210
Serratia marcescens (-)	BIOTECH 1748
Candida albicans	ATCC ® 10231™
** Gram-positve Bacterial Strain (+), Gram-negative bacterial strain (-)**	

P. americana Tissue Drying, Solvent Extraction, and Concentration

After the removal of the cockroach wings and appendages, the samples were air-dried for three days and further dried in an oven. The dehydrated P. americana was pulverized through a laboratory blender A total of 30.0 grams were collected from the pulverized sample and subsequently soaked to a 1:3 ratio of ethanol for three days. The solution was then filtered and evaporated before aseptic preservation (Song et al., 2017).

Kirby-Bauer Disc Diffusion Assay

Kirby-Bauer Disc Diffusion assay was performed to evaluate the possible antimicrobial activity of P. americana tissue extract. In a previously prepared Mueller-Hinton Agar plates, extracts and conventional antibiotics (Rifampicin, Trimethoprim, Ofloxacin, Penicillin, and Nystatin) were impregnated and incubated for 24 hours at 35-37° Celsius; all assays were done in triplicates (Sanders, 2012).

Statistical Treatment of Data

Data generated from the assay was recorded; the mean was used for each parameter. The results from Kirby-Bauer Disc Diffusion assay were statistically evaluated using one-way ANOVA where P values ≤ 0.05 were considered significant.

Results and Discussions

Kirby-Bauer Diffusion Assay using Periplaneta americana tissue extract

A single cockroach species was sampled for the extraction of tissues and evaluated the antimicrobial activity against indicator strains. The study focused on the common household cockcroach (Periplaneta americana). The results of Kirby-Bauer Diffusion assay showed that there are statistically significant differences between the activity of extracted tissue with antibiotic controls Ofloxacin, Penicillin, Rifampicin, and Trimethoprim against five bacterial strains: Enterococcus faecalis, Salmonella enteritidis, Vibrio parahaemolyticus as determined by one-way ANOVA at α = 0.05. Table 2 shows the summary of the results of the assay.

Table 2. The average diameter of the zone of inhibitions of extract from Periplaneta americana

Pathogens	Extract	Rifampicin	Trimethoprim	Ofloxacin	Penicillin	Nystatin	p-value
E. faecalis	-	31.47	31.47	33.6	45	-	0.000
S. enteritidis	-	28.67	31.33	32.67	35.8	-	0.000
V. parahaemolyticus	10.43±0.91	8.8	11.2	25.47	0	-	0.00013[5]
C. albicans	9.27±0.83	-	-	-	-	10.53	0.000911[5]
S. marcescens	-	-	24.83	26.1	-	-	0.000

Note: Diameter of zone of inhibition includes well diameter 8 mm. 5Refers to statistically significant ≤ 0.05

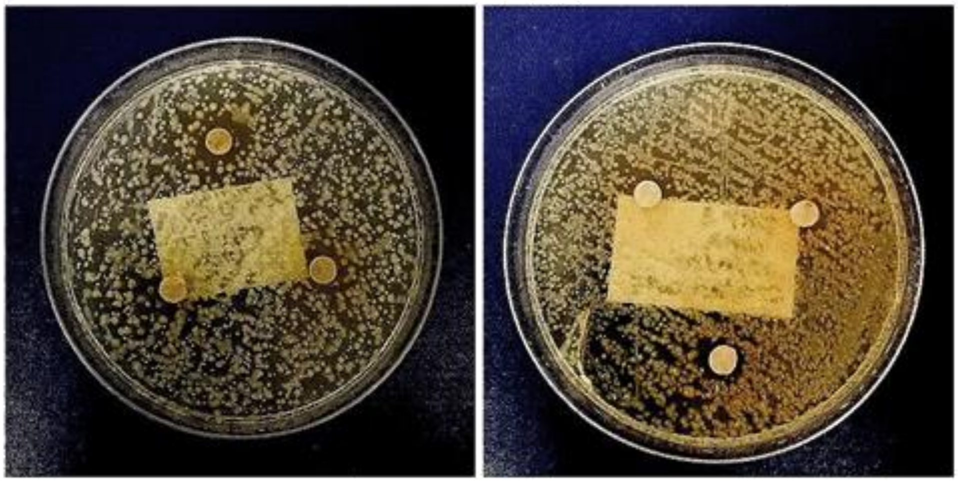

Figure 2: Zone of Inhibition. A) In Vibrio parahaemolyticus the extract exhibited an average of 10.43± 0.91mm inhibition with a p value of 0.000135, while in B) Candida albicans, a mean of 9.27±0.83mm and p value of 0.0009115 were recorded.

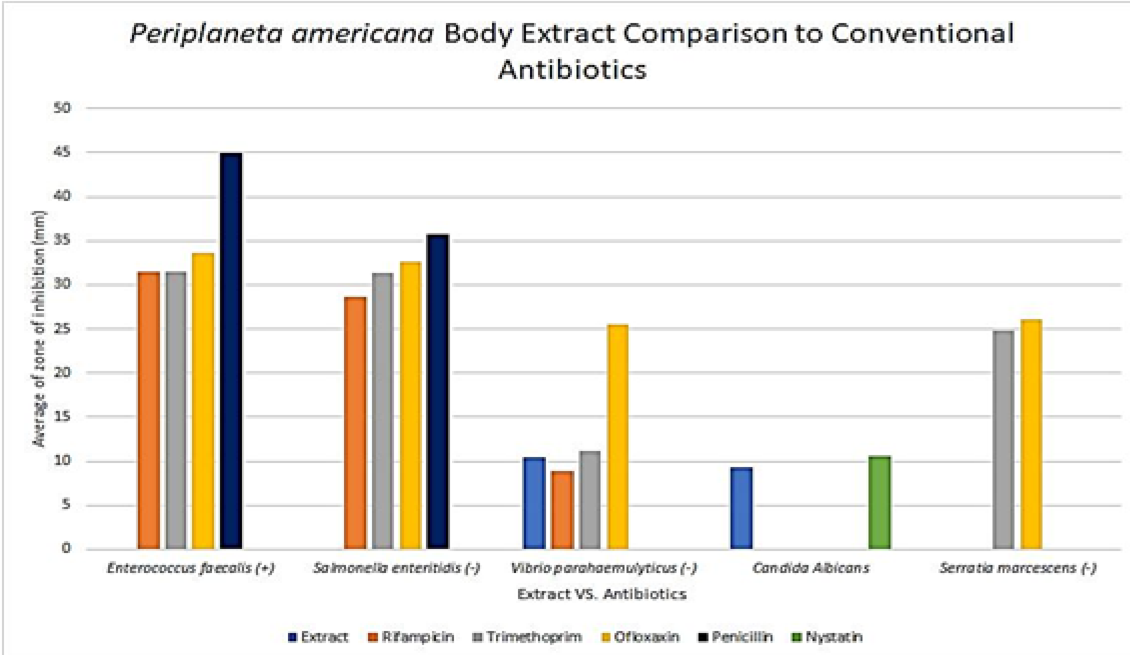

Figure 3: Graph of comparison between Periplaneta americana tissue extract with the five conventional antibiotics, Rifampicin, Trimethoprim, Ofloxacin, Penicillin, and Nystatin; as depicted in the graph, the extract showed a comparable inhibition towards Rifampicin and Trimethoprim as opposed to V. parahaemolyticus, similar results were seen with Nystatin in combating C. albicans. No inhibition was recorded against E. faecalis, S. enteriditis, and S. marcescens.

Discussion

The prevalence of gastrointestinal (GI) tract illnesses is the primary concern for selecting E. faecalis, S. enteritidis, V. parahaemolyticus, C. albicans, and S. marcescens. These pathogens not only cause the said diseases but also infect and are acquired by immunocompromised people. As shown the in graph, the tissue extract of Periplaneta americana exhibited an interesting antimicrobial activity against two bacterial pathogens. In a research conducted by Anwar et al., (2003) it was revealed that a protein isolated from purified hemolymph of P. americana, exhibited inhibition among several gram-positive bacteria, however no inhibition were recorded amid the gram-negative culture used; as opposed to this, P. americana tissue extract as utilized in this study presented an activity to a gram-negative bacterium-Vibrio parahaemulyticus. Moreover, the potent antibacterial activity of P. americana crude brain extract was also tested in a study pioneered by Ali et al., (2017) and presented promising results. The potential ability of the cockroach species to counter pathogenic microorganisms could be an underlying result of the species encounter with different types of microbes and superbugs in their environment, and were able to ward off diseases by producing antimicrobial substances (Ali et al., 2017).

The ability of insects to combat or resist bacterial infections lies in their capabilities to detect bacteria, thus produce series of antimicrobial peptides that are innately present and are released through the hemolymph (Baserri et al., 2016), which are commonly composed of small, amphipathic, cationic molecules (Gao and Zhu 2013). Specifically, in Periplaneta americana as stated in a study conducted by Ali et al., (2017), few homologous compounds were identified that contained isoquinoline group, chromene derivatives, thiazine groups, imidazoles, pyrrole-containing analogs, sulfonamides, furanones, and flavanones which are known to possess broad-spectrum antimicrobial properties, anti-inflammatory, anti-tumor, and analgesic properties. Aside from these, P. americana was claimed to have an ability to produce inducible antimicrobial peptides particularly lysozyme which acts as an opsonin (Kim et al., 2010), an antibody which reacts to foreign microorganism making the pathogens susceptible to ingestion by phagocytes (Winkelstein, 1973). Subsequently, in a De Novo Transcription Analysis executed by Kim et al., (2016) 11 peptides were found to produce antimicrobial activities in various pathogenic bacterial strains. Furthermore, peptide constituents of P. americana are labeled to possess more than 16 amino acids, including 7 human essential amino acids and two human semi-essential amino acids that contribute to its chances of generating antibiotics (Zhao et al., 2017).

Conclusion and Recommendations

Varied analyses and experimentations of different parts of Periplaneta americana have showed that it is a promising source of innate antimicrobial components; in this research P. americana tissue extract was tested to combat pathogenic enteric bacteria - Enterococcus faecalis, Salmonella enteriditis , Vibrio parahaemolyticus, and Candida albicans. However, the extract only showed significant effects against: V. parahaemolyticus and C. albicans. The investigation proved that P. americana can counter gram-negative bacteria as oppose to other study claims. The activity exhibited against test pathogens could be attributed to the chemical and biological composition of the P. americana’s tissue. On the other hand, environmental factors, methods of extraction might influence the potency of antimicrobial peptides. Thus, further research should be conducted to determine active compounds present in the extract and evaluate the applicability of this source of natural product in the development of new antimicrobials against enteric bacteria and other pathogenic bacterial strains.Sed decore meliore scripserit an, primis apeirian invenire in vim. Brute causae recteque nec an, congue iuvaret ut vis, essent corrumpit adolescens ne mea. Ut eum elit eius brute. Te nemore volumus quaestio mei. Mea ne aperiam fabellas facilisi, veritus invidunt ei mea.

Acknowledgement

The researchers would like to thank their skilled professor of Microbiology and Parasitology; and the Chief of Center for Life Sciences and Research- Mr. Gary Antonio C. Lirio, for his guidance throughout this article. Also, to the Engineering and Science Research Center for providing laboratory tools and equipment needed for the research.

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Evaluating the Protective Effects of the Ginseng Extracts on Hypoxia/Reoxygenation-Subjected Cardiomyocytes

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Abstract - Background: The search for new products for ischemic heart diseases is being interested of scientists due to it is the main cause of cardiovascular disease mortality. Objective: In this study, we evaluated the protective effects of Panax bipinnatifidius Seem. extracts (GE) on hypoxia/reoxygenation (HR)-treated rat H9C2 cardiomyocytes. Materials and Methods: Rat H9C2 cardiomyocytes were normally grown in normal condition or subjected to HR conditions. NecroX-5 (10 μM) was used as positive control for cardiac protective effect. The GE was employed to culture media at the onset of reoxygenation period. The values of cell viability and mitochondrial function were tested using Cell Counting Kit-8 and the suitable fluorescence kits. Results: HR conditions dramatically induced H9C2 cell death ($p<0.05$). Treatment of NecroX-5 or GE effectively reduced HR injuries in a dose dependent manner. Similar to NecroX-5 group, ginseng extract-treated cells had the higher viability level compared to those in HR-subjected cells ($p<0.05$). In addition, supplementation of GE at the onset of reoxygenation strongly prevented the collapse of mitochondrial membrane potential and reduced mitochondrial oxidative stress ($p<0.05$). Conclusion: This study suggested that the total saponin extract from Panax bipinnatifidius Seem. exerts cardioprotective properties against HR damage.

Keywords - Oxidative stress, hypoxia/reoxygenation, H9C2, NecroX-5.

Introduction

Myocardial infarction is the main cause of death from cardiovascular disease (Mozaffarian et al., 2016). The timing of revascularization in combination with anti-oxidants and anti-platelet agents are decisive factors for the effectiveness treatment of patients (Picker, 2013). The search for natural products to develop new drugs for the treatment of ischemic heart diseases is being interested of scientists due to it is the main cause of cardiovascular disease mortality (Han J; Zhang, Xie, Xu, & Shi, 2015). Experimental data have shown that drugs used in the treatment of myocardial infarction have mechanisms related to mitochondrial preservation (Armstrong, 2008; Heller, Brockhoff, & Goepferich, 2012; Vu Thi Thu et al., 2012; Walters, Porter, & Brookes, 2012).

Ginseng is a precious medicinal herb, widely used in traditional medicine and pharmaceutical industry in many countries. Many ginseng species such as Vietnamese Ginseng, Panax bipinnatifidus Seem., Radix Angelicae Sinensis, Salvia miltiorrhiza Bunge... growing naturally has been recognized and widely used in traditional remedies for anti-fibrotic treatment, anti-infarction, increasing nerve function, reducing the risk of cancer, maintaining a healthy immune system or blood sugar stability (dela Pena et al., 2016; Hafez et al., 2017; Vu Thi Thom et al., 2018). For ischemic diseases, the efficacy of ginseng and its ginsenosides on stroke outcomes with the anti-oxidant property has been described (Gan & Karmazyn, 2018; Liu, Anderson, Fernandez, & Doré, 2019; P. Luo, Dong, Liu, & Zhou, 2015). Also, ginseng extracts have been shown to possess beneficial effects in myocardial infarction (Y. Luo et al., 2020; Vu Thi Thu, Yen, & Thi, 2021; Vu Thi Thu, N. T. H. Yen, et al., 2021). In which, Panax bipinnatifidus Seem. has anti-platelet activity with its major saponin component, araloside A methyl ester (Vu Thi Thom, Giang, Ngan, Van, & Diep, 2019; Vu Thi Thom et al., 2018; Van et al., 2017). However, experimental analysis of the role of total saponin extract of Panax bipinnatifidus Seem. in modulating cardiomyocytes and mitochondrial function during the revascularization phase is still lacking. Therefore, this study was carried out to evaluate the potential role of Panax bipinnatifidus Seem. extract (GE) in ischemic heart model using H9C2 cardiomyocytes.

Methodology

Samples

H9C2 cardiomyocytes (ATCC©-USA) was provided by the Cardiovascular and Metabolic Disease Center, Inje University; Panax bipinnatifidus Seem. extract (GE) was provided by Phenikaa University. The study was performed at Life Science Research Center, Faculty of Biology, VNU University of Science.

Materials

Dulbecco's Modified Eagle Medium 4.5g/L glucose (DMEM, Gibco, USA); Penicillin-Streptomycin (PS, Gibco, USA); Fetal Bovine Serum (FBS, Gibco, USA); Phosphate Buffered Saline (PBS, Gibco, USA); Cobalt Chloride ($CoCl_2$, Sigma, USA); Dimethyl Sulfoxide (DMSO, Sigma, USA); Cell Counting Kit-8 (CCK-8, Dojindo, Japan); 2′,7′-dichlorodihydrofluorescein-diacetate (CM-H_2DCFDA, Invitrogen, USA); tetramethyl rhodamine ethyl ester (TMRE, Invitrogen, USA); Inverted microscopy Axiovert (S100, Carl zeiss, Germany); Culture dishes, 96-well black, glass bottom plates, CO_2 Incubator (Shellab, USA); Microreader plate (Tristar, USA).

Methods

Cell culture, hypoxia-reoxygenation (HR) in vitro model and treatments

H9C2 cells, were maintained in DMEM supplemented with 100 µg/mL of PS and 10% FBS at 37°C, 5% CO_2. The cells were grown in 96-well black plate, glass bottom at a density of 5.103 cells/well. Cells were cultured under normal condition and supplied with Panax bipinnatifidus Seem. extract (GE, 5-1000 µg/mL) to evaluate the toxicity as well as to determine the optimal dose of GE. For $CoCl_2$-stimulated HR model, after 24 h, the cells were then subjected to $CoCl_2$ (300 µM) at 37°C and 5% CO_2 for 24 h (simulating the hypoxia stage) as described in the previous publication (Yến, Dậu, Bích, & Thu, 2019). Then, the medium containing $CoCl_2$ was removed; the cells were continuously grown for 24 h in new media containing either DMSO (HR, HR-$CoCl_2$+DMSO) or DMSO plus GE (GE, HR-$CoCl_2$+DMSO+GE). Cells were cultured under normal condition (DMEM, 10% FBS, 1% PS, 37°C and 5% CO_2) for 54 h without any treatment served as a control group. The optimal dose of GE was will be chosen for assessing its cardioprotective effects against HR via cell viability and mitochondrial indexes. Experiments were performed at least in triplicate.

Besides, HR model was also set by alternating the O_2 levels in culture conditions. H9C2 cells were cultured in normal medium at 37°C with 5% CO_2 for 18 h. For hypoxic culture, the cells were then cultured in serum-free low-glucose DMEM at 37°C, 95% N_2, 5% CO_2, and 2% O_2. For reoxygenated culture, cells were grown under normal condition following hypoxic condition. After incubating in hypoxic condition for 6 h, H9C2 cells were then transferred to reoxygenation period for 24 h. At the time of reoxygenation, H9C2 cells were separately treated with either GE or NecroX-5 (10 µM, served as positive drug control). The stocks of NecroX-5 and GE were prepared in DMSO. The final concentration of DMSO in cultured medium was 0.1%. The difference was expressed as a percentage value relative to HR group.

Cell viability assay

Cell viability was assessed by using CCK-8 kit as described in the last study (V. T. Thu et al., 2016). H9C2 cells were seeded in triplicate into 96-well culture plates at a density of 5.103 cells per well. By the end of the experimental periods, the cell groups were further incubated with CCK-8 solution for 1-4 h. The absorbance value indicating cell viability was measured at 450 nm using the microplate reader. The number of alive cells was expressed as a value relative to the normal control or HR. The cell images were also captured using the inverted microscopy Axiovert. Experiments were repeated at least 3 times.

Measurement of mitochondrial membrane potential

At the end of experimental periods, the different cell groups were stained with 0.1 µM tetramethyl rhodamine ethyl ester (TMRE, ex/em: 535/570 nm) for 30 min at room temperature. After washing twice with PBS, the different fluorescence intensities were measured using the microplate reader. The TMRE intensity was expressed as a percentage value relative to HR. Experiments were performed in triplicate.

Measurement of hydroperoxide production

At the end of experimental periods, the different cell groups were stained with 5 µM CM-H_2DCFDA (ex/em: 485/525 nm) at 37°C for 30 min to detect changes in hydroperoxide (H_2O_2) levels. After washing, the fluorescence intensity was measured using the microplate reader. The total fluorescence intensity in each well was expressed as a percentage value relative to the HR. Experiments were repeated in triplicate.

Statistical analysis

Data are presented as means ± standard error of the mean (SEM) using Origin 8.5. Differences between the two groups were evaluated by one-way analysis of variance (ANOVA) and Turkey test. Differences with a p-value ≤ 0.05 was considered significant.

Results and Discussions

GE reduced H9C2 cell death under $CoCl_2$-stimulated HR injury in a dose-dependent manner

H9C2 cells were cultured in DMEM supplemented with 10% FBS, 100 µg/mL of PS, and 5% CO_2 at 37°C for 24 h and were then treated with GE (0÷1000 µg/mL) for next 24 h. The cell viability of GE was determined using the CCK-8 kit as described in the previous study (V. T. Thu et al., 2016). The 48 h EC50 of GE was determined to be 199.41 (µg/mL) using Origin 8.5 software (Figure 1). The results presented that GE showed less toxicity to the H9C2 cells under normal condition.

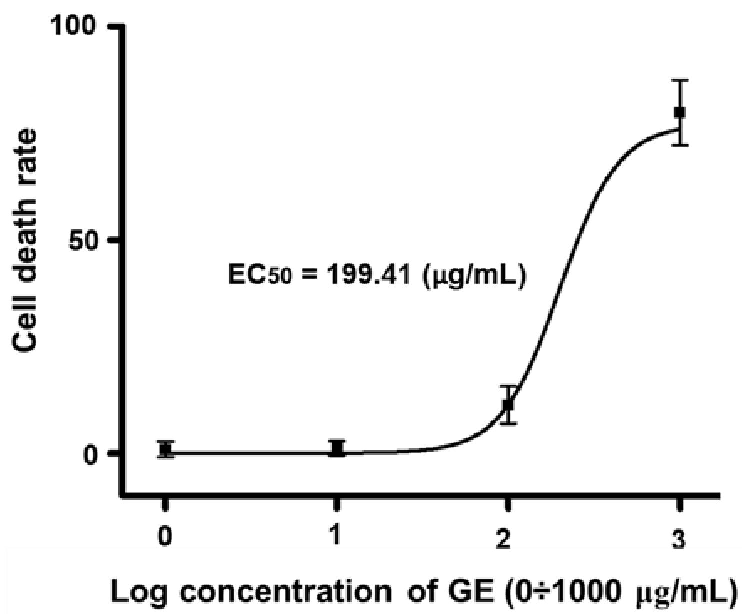

Figure 1. EC50 value of Panax bipinnatifidus Seem. extract (GE)

In consisted with the previous study (Yến et al., 2019), the results showed that viabilities were dramatically reduced in the $CoCl_2$-exposed H9C2 cells compared to normal cells (Figure 2, p<0.05). GE at doses of 5, 10, 31.25 and 62.5 µg/mL strongly prevented the cell death from HR. In contrast, GE at doses of 125, 250 and 500 µg/mL showed their toxicity to cardiomyocytes under HR conditions.

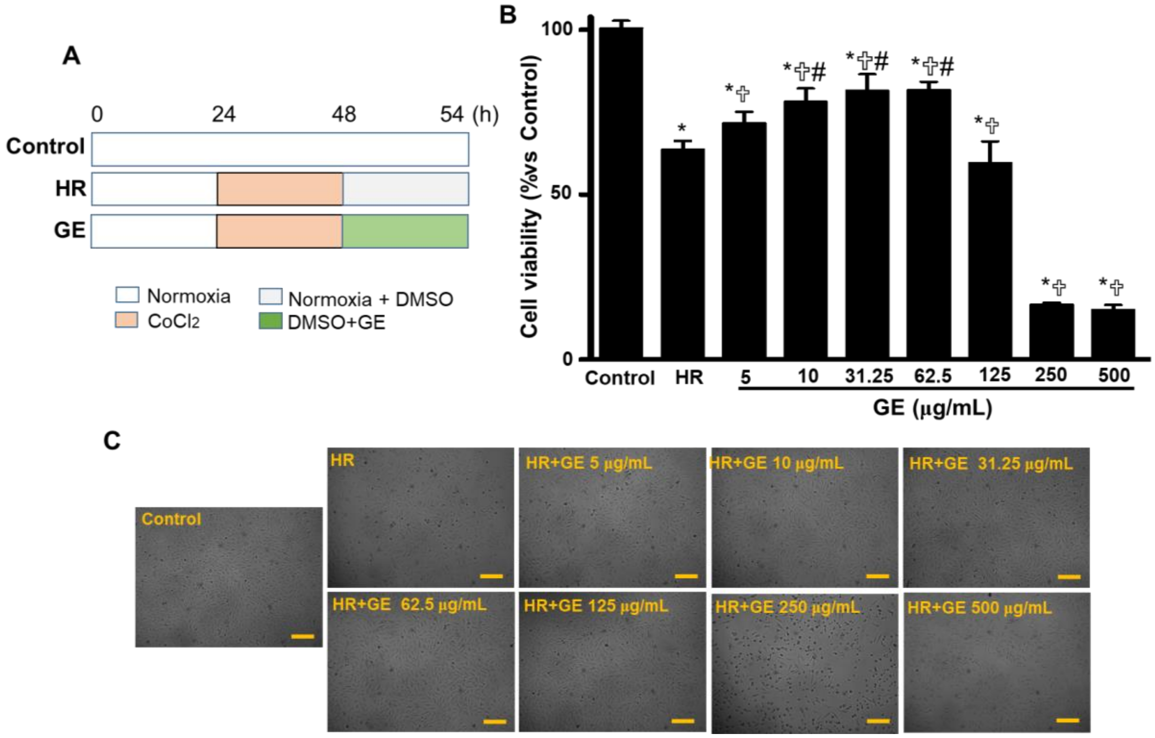

Figure 2. Experimental design and cell viability assay. (A) $CoCl_2$-stimulated HR model and Panax bipinnatifidus Seem. extract (GE) treatment; (B) The graph indicates H9C2 cell viability under different conditions and treatments; (C) H9C2 cell images captured under different conditions and treatments. HR: $CoCl_2$-stimulated condition; GE: HR + GE; *p < 0.05 vs. Control; p < 0.05 vs. HR; #p < 0.05 vs. GE at dose of 5 µg/mL; scale bar = 5 µm; 10x of magnification; n = 3÷4 for each group.

Interestingly, among $CoCl_2$-exposed groups, the high percentages of H9C2 viability were presented in the GE treatment at doses of 31.25 µg/mL and 62.5 µg/mL. Treatment of GE at doses of 31.25 µg/mL and 62.5 µg/mL dramatically increased the cell viability up to 81.63±2.01% and 81.88±0.96%, respectively (100% of normal control). Though GE showed less toxicity to H9C2 cells under normal condition (Figure 1), the viability of GE-treated groups with the higher doses (125, 250 and 500 µg/mL) was lower than $CoCl_2$-stimulated HR. The results indicated that the GE possessed its cardioprotective effects on cardiomyocytes under $CoCl_2$-stimulated HR were in a dose-dependent manner. The cell morphology and number were also demonstrated (Figure 2C), showing the less cell alive with GE doses at 125, 250, and 500 µg/mL. It was reported that GE has anti-platelet activity with its major saponin component, araloside A methyl ester (Vu Thi Thom et al., 2019; Vu Thi Thom et al., 2018; Van et al., 2017). Another research had screened the bioactive role of the crude GE and reported its weak inhibitory effect on markedly nitric oxide production in lipopolysaccharide-treated RAW 264.7 cells (Nguyen et al., 2021). The current results further documented the bioactivity of GE with different effects on cell viability and these depend on HR treatments. The finding showed that the effective doses of GE against HR damage were about 31.25 µg/mL and 62.5 µg/mL. In this study, GE post-hypoxic treatment at dose of 31.25 µg/mL was chosen for further evaluations.

GE protected cardiomyocytes via preserving mitochondria function against HR damage

The data showed the cardioprotective effects of GE against HR injury via elevating cell viability (Figure 3B), enhancing mitochondrial membrane potential (ΔΨm) and reducing oxidative stress level (Figure 4). The experiment designed for HR model was depicted in Figure 3A. In this model, NecroX-5, the positive control, showed its efficacy in protecting the cells against HR as mentioned in the previous study (Vu Thi Thu et al., 2012). As described, H9C2 cells were subjected to different conditions and the cell survival rates were measured using the CCK-8 kit (Figure 3). Post-hypoxic treatment of either NecroX-5 or

GE significantly increased the cell viability compared to HR condition (p<0.05). Among HR-exposed groups, the highest H9C2 viability was presented in the GE-treated cells (231.34±12.38, % vs. HR). Though the cell viability of GE-treated group (at dose of 31.25 µg/mL) were higher than another GE-treated group (at dose of 62.5 µg/mL, 213.14±10.98, % vs. HR); there was insignificant difference between these two groups. Moreover, the use of DMSO (0.1%) showed no significant effect on the alive of H9C2 cells under HR condition as mentioned in previous study (Vu Thi Thu, Bich, & Yen, 2021). These results further confirmed the effective role of GE in protecting H9C2 cardiomyocytes against HR damage (Figure 2) and the protective effects of the other products of ginseng (Vu Thi Thu, N. T. H. Yen, et al., 2021). The data suggested that the different protective levels could be resulted from the concentration and components of the tested extracts.

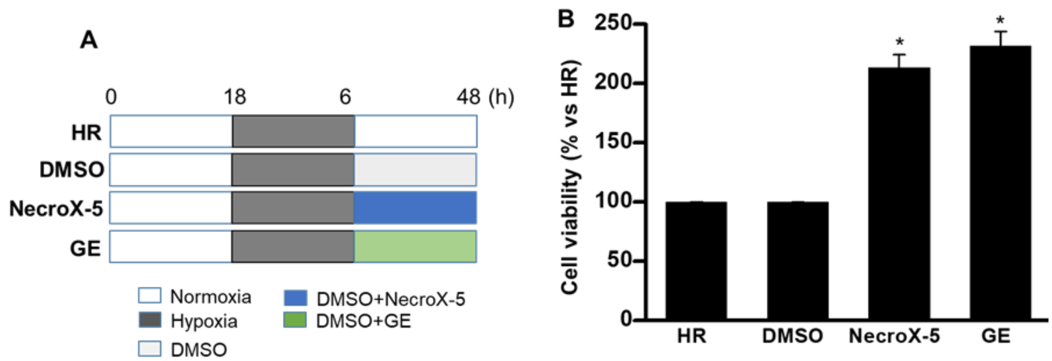

Figure 3. Experimental design and the H9C2 cell viability under conditions. (A) Hypoxia/reoxygenation (HR) model and treatments; (B) The graph indicates H9C2 cell viability under different treatments. NecroX-5: HR + NecroX-5 (10 µM); GE: HR + GE (Panax bipinnatifidus Seem. extract, 31.25 µg/mL); *p < 0.05 vs. HR; n = 3 for each group.

In this study, TMRE was used to evaluate the role of GE on the mitochondrial function according to the manufacturer's instructions. Post-hypoxic treatment of NecroX-5 and GE significantly increased the ΔΨm compared to non-treated HR condition (Figure 4A, P<0.05). The values of TMRE intensity in HR, DMSO, NecroX-5 and GE groups were 100.13±0.01%, 100.12±0.21%, 132.93±2.34% and 112.98±0.43%, respectively (Figure 4A). In consisted with previous report (Vu Thi Thu, N. T. H. Yen, et al., 2021). HR significantly protected mitochondrial function against HR. There was an insignificant difference in TMRE intensities between NecroX-5 and GE groups (P>0.05). Thus, the altered results indicated that intervention methods could be varied by changing ginsengs and their saponin components. Moreover, the loss of ΔΨm during HR was prevented by pre-treating of the triterpenoid saponin named clematichinenoside (Ding et al., 2016) or post-hypoxic treatment of majonoside-R2 (Vu Thi Thu, N. T. H. Yen, et al., 2021).

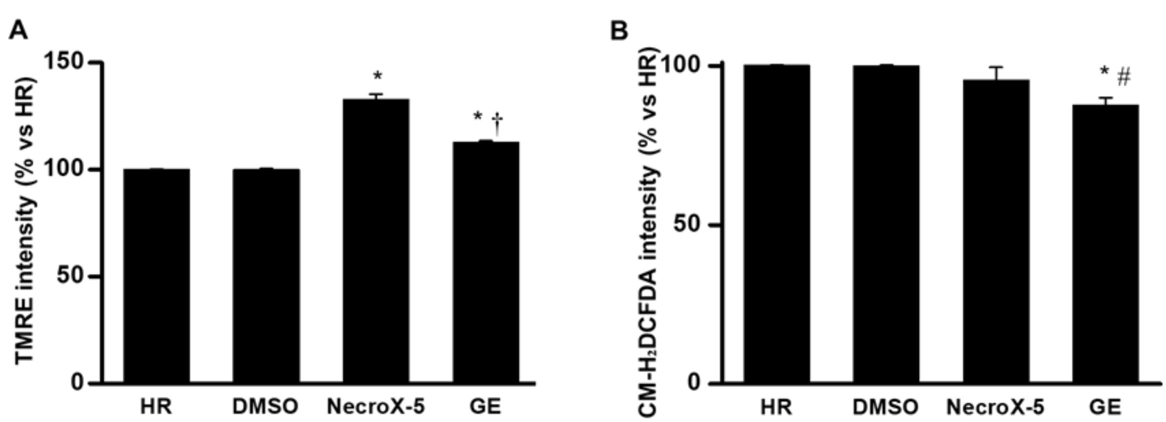

Figure 4. Mitochondrial function. The graphs present the mitochondrial alterations in H9C2 cells subjected to different treatments. A. Mitochondrial membrane potential (TMRE intensity); B. H_2O_2 (CM-H2DCFDA intensity); HR: hypoxia/reoxygenation; NecroX-5: HR + NecroX-5 (10 µM); GE: HR + GE (31.25 µg/mL); *p < 0.05 vs. HR; #p < 0.05 vs. NecroX-5; n = 3 for each group.

Besides, ability of GE to preserve mitochondrial function was further showed in examining of H_2O_2 production. H_2O_2 levels in H9C2 determined by using CM-H_2DCFDA was minimized NecroX-5- and GE-treated groups compred to non-treated HR group (Figure 4B). CM-H_2DCFDA intensity values evaluated in HR, DMSO, NecroX-5, and GE were 100.14±0.05%, 100.55±0.156%, 95.66±3.83%, and 87.78±2.05%, respectively. Interestingly, there was significant difference between NecroX-5 and GE groups. This finding provided more evidence for the antioxidant properties of ginseng products under HR damage (Vu Thi Thu, N. T. H. Yen, et al., 2021; Zuo et al., 2018). Probably, the different phenomenon could be a result of the saponin components (Duong, Nguyen, Nguyen, & Nguyen, 2016) and extraction solvents (Huang et al., 2019). Generally, the efficacy in maintaining mitochondrial function of ginseng products against HR damage were described (Vu Thi Thu, Ngo Thi Hai Yen, et al., 2021; Yu et al., 2016; Zuo et al., 2018). However, more studies should be done to clarify the exact mechanism action of GE on cardiomyocytes under HR injuries.

Conclusion

To the best of our knowledge, this is the pilot study investigating the protective effects of Panax bipinnatifidius Seem. extract against HR damage via protecting cardiomyocytes as well as preserving mitochondrial function.

Acknowledgement

We thank Prof. Han Jin, Prof. Kim Hyoung Kyu, Assoc. Prof. Nguyen Lai Thanh, Assoc. Prof. Nguyen Huu Tung, Dr. Vu Thi Thom, Dr. To Thanh Thuy, Dr. Pham Thi Bich for their help and supports.

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Characteristics of Arithmetic Derivative on Some Integer Sequences

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Abstract - Number theory is considered as one of the most interesting topics in studying Mathematics. Numbers, sequences, patterns, formulas, and theories are gradually evolved as time goes by. Eventually, different ideas arise in terms of applying the concept of number theory to other discipline of Mathematics such as Arithmetic derivative. One of the bases of the study is from Dahl, N., et al (2011) who studied the general properties of arithmetic derivative in inequalities and in function. This derivative is a mapping from the set of natural numbers to the set of whole numbers such that , sending every prime number into 1, and satisfying the product rule of differentiation for every pair of natural number. The researchers investigated its properties as well as its characteristics with square numbers, square free numbers and perfect numbers. Descriptive and expository methods of research were used to provide proofs to existing properties and provided new knowledge on the arithmetic derivative of other integer sequences. It was found out that the arithmetic derivative of a natural number is and the arithmetic derivative of even perfect number is for any positive integer k and prime p. The study suggests to further study on general formula of arithmetic derivative of integers and rational numbers, and its relation to number theoretic functions.

Keywords - Leibnitz Rule, Perfect Number, Product Rule, Power Rule, Inequalities

Introduction

The theory of numbers has always occupied a unique position in the world of mathematics. This is due to the unquestioned historical importance of the subject. Nearly every century since classical antiquity has witnessed new and fascinating discoveries relating to the property of numbers; and, at some point in their careers, most of the great masters of the mathematical sciences have contributed to this body of knowledge. Many discoveries in number theory are very interesting because of their relationships to other field in mathematics. In consequence, math readers enhance their mind to become enthusiastic and creative in proving theorems and exploring the different areas of number theory.

One of the most fascinating relationships between number theory and analysis is a function that allows the differentiation rules or Leibnitz rule on the set of natural numbers. In differential calculus, Sir. Isaac Newton was one of the first mathematician used the concept of derivative to determine the instantaneous rate of change of the given objects under second law of motion.

Mathematically, the rate of change of a function is equivalent to $\lim_{\Delta x \to 0} \frac{f(x+\Delta x)-f(x)}{\Delta x}$. Until, Victor Ufnarovski in 2003 at the journal of integer sequences discussed the concept of differentiation as a function that maps from the set of whole numbers to the set of natural numbers that exhibits some properties of usual differentiation in real valued function x.

In this study, the researcher has expounded and extended the properties of function which holds Leibnitz rule on natural number and uses concept to other type of number sequence.

Methodology

This study used expository and descriptive methods of research. According to Igwenagu (2014) expository research is based purely on existing information and normally leads to "review – type reports". It involves reading widely on a field, comparing and contrasting, analyzing and synthesizing all points of view and developing new insights. In addition to this, this study used descriptive method to provide an aphoristic definition of the concepts related to arithmetic derivative of natural number. According to Nassaji

(2016), the goal of descriptive research is to describe a phenomenon and its characteristics. Hence, it is appropriate method to show the results in the study.

Results and Discussions

The following are the findings of the study:

1. The Arithmetic Derivative of a natural number is defined by a mapping that sends every prime number into 1 and satisfying the Leibnitz rule for differentiation such that

$$n' = \begin{cases} 0 & if\ n = 1 \\ 1 & if\ n = prime \\ n_1 \cdot n_2{}' + n_1{}' \cdot n_2 & if\ n = n_1 n_2,\ n_1, n_2 \in \mathbb{N} \end{cases}$$

2. Basic derivative rules were proven using the definition of arithmetic derivative that maps from $0 \cup \mathbb{N} \to \mathbb{N}$.

   2.1. The Product Rule: Let $n = p^k$ for any prime p and nonnegative integer k, then $n' = kp^{k-1}$.

   2.2.. The General Product Rule

   2.2.1. If $n = p_1 p_2 p_3 \ldots p_k$, then $n' = n \sum_{i=1}^{k} \frac{1}{p_i}$ for any primes p_i.

   2.2.2. The derivative n' can be well-defined as follows: if $n = \prod_{i=1}^{k} p_i{}^{\alpha_i}$ is a factorization in prime powers, then $n' = n \sum_{i=1}^{k} \frac{\alpha_i}{p_i}$.

   2.3. Linearity: If $(a + b)' = a' + b'$, then for any natural number k, we have $(ka + kb)' = (ka)' + (kb)'$.

3. There are important results of arithmetic derivative established to some integer sequences:

   3.1. For any squarefree number n, in the form of $p_1 p_2 p_3 \cdots p_k$, $n' = n \sum_{i=1}^{k} \frac{1}{p_i}$.

   3.2. If n is square number in the form of $= p_1^2 p_2^2 p_3^2 \ldots p_k^2$ or $(p_1 p_2 p_3 \ldots p_k)^2$,$n' = 2n \sum_{i=1}^{k} \frac{1}{p_i}$.

   3.3. For every even perfect number n, $n' = 2^{k-2}(kp - p + 2)$.

Conclusion and Recommendations

Based on the findings, the following conclusions were drawn:

1. The Arithmetic of Derivative of a Natural number is a function with the domain of whole numbers that sends every prime number to 1 and it follows the Leibnitz rule of differentiation such as product rule.
2. The Leibnitz rule of differentiation such as power rule, general product rule, and linearity were also derived.
3. Special properties of arithmetic derivative were established in perfect number, square free numbers, and square numbers.

Based on the findings and conclusions of the study, the following recommendations were formulated:

1. Further study of Arithmetic derivative using different domain such as integer or rational numbers.
2. Sum rule formula for arithmetic derivative of natural number may be established.
3. Special properties of arithmetic derivative may be derived from other integer sequences.

Acknowledgement

The researchers would like to thank their families for unending love and support to make this study possible. They also thank the Almighty God for the knowledge and Wisdom He impart to the researchers during difficult times.

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Impact Assessment of Aqua Silviculture of Milagros and Placer, Masbate

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Abstract - With the alarming poverty incidence among fisherfolks communities, the Bureau of Fisheries and Aquatic Resources (DA-BFAR) created a livelihood project funded by United Nations International Fund for Agricultural Development (IFAD). To assess the impact of the project, various state universities and colleges in Bicol region conducted an impact assessment on the said project. The study used convenience sampling in the field surveys and focus group discussions to draw conclusions. The respondents are the recipients of the aqua silviculture livelihood project. The study reveals that the beneficiaries have big household making them hard to financially sustain the basic needs of the family. It was also noted that they do not have their own lot where they built their houses, and the source of drinking water is an unprotected well. Further, the livelihood project is not sustainable because of various problems such as no profit from the first production cycle, some beneficiaries backed out during the implementation and the association itself is not technically prepared to implement the project to sustainable ends. Conduct of more technical capability training along varied aspects of aqua silviculture shall be caried out. Also, trainings on financial literacy, business management and basic record keeping are crucial. There is also a need to craft a clear-cut guideline and operational protocol to guide the aqua silviculture venture. Perhaps, a root cause analysis of the previous production cycle should be carried-out to highlight lessons and undertake corrective measures. The association must be reorganized, reoriented, and retooled.

Keywords - Aqua silviculture, Asid Gulf, FishCORAL, Livelihood Project, Poverty

Introduction

Livelihood programs and projects are one of the major activities and investments of government and non-government organizations to achieve self-sufficiency and self-productivity among its clients. As what a famous saying of a Chinese philosopher Lao Tzu “Give a man a fish and he will eat for a day. Teach a man how to fish and you feed him for a lifetime” this is perhaps one of the guiding principles and philosophies of all livelihood providers such as government and non-government organizations because livelihood projects are projects that ensure to empower, nurture and help the beneficiaries discover their full potential, help them to become more rational and control their environment for self and resource sustainability. In addition, livelihood projects create employment toward its beneficiaries and additional or main source of income in order to combat the very alarming poverty incidence in the country.

The Philippine fisherfolks communities are some of the populations having the highest percentage of people with high poverty incidence (PSA, 2018). Factors such as (1) low educational attainment is the main contributor to this big problem in the country which leads to being laggards to the technologies offered to the farmers and fisherfolks; (2) unstable income because of changing weather (typhoon and big waves); (3) reduction of fish stocks and the persistent destruction and deterioration of coastal areas due to irresponsible and unsustainable farming/fishing practices; and (4) climate change - these are some of the few reasons for this poverty scenario.

To aid alleviate the poverty incidence among fisherfolks’ families, the Philippine Government through Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA-BFAR) created a project dubbed as Fisheries, Coastal Resources and Livelihood (FishCORAL). The project aims to reduce poverty incidence among its beneficiaries while protecting the natural resource and mitigating and adopting climate change phenomenon.

Under the FishCORAL project, aqua silviculture is one of its livelihood projects introduced and given to its fisherfolks beneficiaries. The main concept of this project is to restore the Philippine mangrove and provide livelihood to the fisherfolks community to mitigate climate change, food security and to alleviate poverty. Aqua silviculture is a type of fish culture system that produces fish (most of the time, crustaceans such as mudcrabs (Scylla serrata) are used) without destroying or cutting down mangroves that are natural habitat of various wildlife. The need to protect, preserve and restore mangrove is necessary because it is one of the most valued resources in aquatic system. According to Melana and Courney (2000) as cited by Dieta and Dieta (2014) the reduction of mangroves in the Philippines is proportionate to the reduction of fishery resources. Due to conversion of mangrove areas to fisheries production such as for fishponds and other forms of utilization, the mangrove area enormously declines from 400,000 -500,000 ha. in 1918 to 120,000 ha in 1994-1995 and 256,185 ha in 2000 (Dieta and Dieta, 2014). Thus, replanting and protecting mangrove is one key mitigation to problems in the coastal areas to increase income and mitigate climate change in the country.

Figure 1. Aqua Silviculture Livelihood Project in Milagros, Masbate

The aqua silviculture is an aquaculture practice that protect or care for the mangrove while having a fish production. In order to do this, the design of the production follows the standard 70:30 ratio of mangrove to water canal. Figure 1 shows a typical aqua silviculture in Masbate. The main beneficiaries of this project are the fisherfolks who joined the mangrove planting in their respective locality. Masbate is one of the recipients of the aqua silviculture in the country because of the fact that fisheries is one of the major livelihoods in the province and huge hectarage of mangrove swamps abound in the municipalities of Placer and Milagros.

In order to assess the implementation, and the impacts of the livelihood created within the five-year implementation of FishCORAL project (2016-2020) in Bicol Region the Bicol University in partnership with Dr. Emilio B. Espinosa Sr. Memorial State College of Agriculture and Technology (DEBESMSCAT) and other state universities in Bicol were tapped to conduct the Rapid Project Impact Assessment (RPIA) for Albay, Ragay and Asid Gulfs. Under this program is the study on the impact assessment of aqua silviculture of Milagros and Placer Masbate.

The objectives of this assessment are to: (1) Identify inputs, outputs and outcomes of aqua silviculture in Milagros and Placer, Asid Gulf; (2) Analyze the impact pathways of the aqua silviculture in Milagros and Placer towards the key performance outcomes of FishCORAL project; (3) Assess the economic and social impacts of the aqua silviculture in Milagros and Placer; and (4) Document lessons to improve the implementation of fishery policies, programs and plans for effective livelihood initiatives.

Methodology

Research Design

In order to achieve the objectives of this study the following are the methods of data collection. Field surveys were undertaken to fishing households wherein the respondent households are those aqua silviculture beneficiaries. Convenience sampling was employed. Focus group discussion (FGD) were also carried-out as members of each aqua silviculture beneficiaries were gathered and engaged in discussion about key vital aspects of the operation of the livelihood project.

To gather the information on the socio-economic characteristics, asset ownership and women empowerment, the structured questionnaire was utilized wherein the detailed information such as socioeconomic status, different assets of the family, source of income and their expenditure were obtained and used as part of bases in assessing the level of impact of the project.

Limitations of the Study

CoViD-19 Pandemic was considered as one of the limitations to this study because of some travel restrictions and safety protocols which gives the researchers a hard time gathering respondents. Limited number of days in the field also a hampered study because of the pandemic and sometimes peace and order reasons. Project proposal and financial statement were not also made available despite of the repeated requests from concerned holders. This is supposedly important in the process of project impact assessment.

Analytical Design

Data collected on socio-economic characteristics and assets of the beneficiaries were subjected to descriptive analysis such as frequencies and percentage. On the other hand, the result on the women empowerment was measured using the ten indicators of the 5DE. Lastly, to assess the performance of the livelihood project, the criteria set by the OECD-DAC were utilized. These are the relevance, effectiveness, efficiency, impact, and sustainability.

Results and Discussions

Analysis of the Household Socioeconomic Characteristics

The respondents from the 34 households represented a total household population of 188 individuals. Majority (60%) of this population are at a broad age class of 16-64 years old (see Table 1). Younger (15 years old and younger) represent 37% while those that are older than 64 are negligible (3%), The selection of the 16-64 year old is based on the disclosure of active fishing engagement of this age class by the respondents during FGDs. This data tells us that there are higher working age population in the coastal areas than the “dependent population”. From an economic asset standpoint, this is advantageous as there are plenty of potential workforce that could support any economic activities in the community.

Overall, the age dependency ratio incurred by both the youngest and oldest age classes account to 67.87. This is 12.7 higher compared to the Philippine age dependency ratio and 14.57 higher compared to the world average (Word bank, 2021). The youth dependency ratio (15 years old and below age class) comprised a 63.39% while the old-age dependency ratio is just 4.46%. The age dependency ratio tells us the connection between the three age groups. The higher the values the greater level of age-related dependency within the population. With the data from the respondents, its apparent that there is a significant dependency burden detected in the community. This is despite of the presence of potential livelihood workforce to support varied economic activities.

Table 1. Households' Socioeconomic Characteristics

Socio-Economic Characteristics	Frequency	Percentage
Age Group		
15 and below	71	37
16 – 64	112	60
65 and above	5	3
Age Dependency Ratio	67.85	
Youth Dependency Ratio	63.39	
Old-age Dependency Ratio	4.46	
Household Size		
1-5	16	47
6-10	18	53
Household Monthly Income		
Range	2,200-37,000.00	
Mean	7,168.72	
Median	6,433.00	

Household size of families that are beneficiaries of the aqua silviculture are relatively big which majority are composed of 6-10 members representing 53% while those households that are composed of 1-5 members just comprise the 47%. families with 1-5 household size and 53% with 6-10 household size. Monthly household income ranged from P2,200-37,000.00. Mean and median measures of these incomes are just within P6,400-P7200/month which is very low and consistent to the findings of Torres et al, (2019) in Asid Gulf.

Analysis of the Livelihood Asset Profile of Households in the Study Area

As per evaluation of input, output and outcome of aqua silviculture in Milagros and Placer, Masbate, the different assets of the beneficiaries were evaluated. Livelihood asset profile is very useful in understanding the situation of a community why they belong to the poor sector. The asset of each family will give the livelihood project planner to have a bigger picture that low income is not just the reason of their poverty, but rather a holistic framework of their assets. Based on literatures, the following are the five key assets or capital that are essential not just for the poor but for all families in order to make for living. The physical assets, social assets, human assets, financial and natural assets. Each of these were the data collected from the respondents to draw some inferences about the livelihood project.

Physical Asset. Physical assets or physical capital are those basic infrastructure that people need to make a living and these includes shelter, water and sanitation system, energy, communication system, and household conveniences. Table 2. Shows that 100% of the families who are beneficiaries of aqua silviculture do not have their own lot where they built their houses. On the other hand, 92% of those families have their own houses but they do not own the lot. It is very critical and dangerous because some of them spend hundreds of thousands for their houses but if the owner of the lot tells them to leave, they would not have the claim to stay. This situation will hinder their development since they do not have the sense of ownership in their "properties".

With regards to the drinking water, only 12% of the families can afford to buy mineral water as their drinking water, the remaining 65% relied on deep well as their source of drinking water and other household uses. This is worse compared to the report of Torres et al, (2019) in Asid Gulf which 24% families as source of their drinking water and only 45.14% relied on deep well. Toilet facilities was also identified in this study as physical asset The result shows that 76% of the families have their own toilet facilities that is flushed to the septic tank. But the data also reveals that the remaining 24% does not have a good sanitary toilet facility which is very necessary in health and sanitation in the family. According to Torres et al, (2019), the common cause of morbidity in Asid Gulf households were viral infection, hypertension and other disease symptoms such as fever and stomach ache. Furthermore, in the United Nation General Assembly last 2010, UN recognizes the access to safe and clean drinking water and sanitation as human right and called international efforts to help countries to provide safe, clean, accessible and affordable drinking water and sanitation. This is very necessary because according to World Health Organization (WHO), 827,000 people in different countries die as a result of inadequate water, sanitation, and hygiene, 60% of that figure was caused of diarrhea deaths and poor sanitation represents the remaining deaths (WHO, 2019).

In terms of household conveniences, the top five assets that each family has are, cellular phone (94%), television set (71%), motorcycle/tricycle (53%), motorize boat/banca (47%), radio/ radio cassette (47%). It shows that only few families have the other remaining convenience assets.

Table 2. Household Physical Assets.

Household Physical Assets	Frequency	Percentage
Tenure status		
Own house, rent-free lot with consent of the owner	19	56%
Own or owner-like possession of house and lot	6	18%
Own house, rent lot	5	15%
Rent-free house and lot with consent of the owner	2	6%
Own house, rent-free lot without consent of the owner	1	3%
Rent-free house, lot rent	1	3%
Source of Drinking water		
Mineral water	12	35%
Protected well/tube well/borehole/water pump	12	35%
Unprotected (open dug well)	7	21%
Neighborhood with water line	2	6%
Developed spring	1	3%
Toilet Facilities		
Flush to septic tank	26	76%
No facility/bush/field	3	9%
Flush to open drain	1	3%
Hanging toilet/hanging latrine	1	3%
Open pit	1	3%
Pit latrine with slab	1	3%
Basin	1	3%
Household Conveniences		
Cellular phone/mobile phone	32	94%
Television Set	24	71%
Motorcycle/Tricycle	18	53%
Motorized boat/banca	16	47%
Radio/radio cassette	16	47%
Washing machine	4	12%
CD/VCD/DVD player	3	9%
Refrigerator/freezer	2	6%
Stove with oven/gas range	2	6%
Component/Stereo set	1	3%
Personal computer	1	3%
Air conditioner	1	3%
Sewing Machine	1	3%
Bike/Bicycle	1	3%

Social Assets. Another livelihood assets/capital that affect or have an impact of the livelihood of a given community is the social asset. This is referring to social resources such as networks, membership of a groups, relationships of trust, access to wider institution of society (Mailath, 2006). In the municipality of Milagros and Placer, Masbate, it shows that 74% of the respondents (aqua silviculture beneficiaries) are members of a livelihood association (Table 3). This membership will have a major impact on the livelihood of a member because most of the livelihood and other opportunities from the government are channeled to organized and recognized associations. Being a member then to recognized associations will provide access to host of opportunities. The data also tells us that 26% of the respondents are member of a credit or microfinance group. Credit has a big role in the development of livelihood since without finances it's impossible to start or continue a livelihood engagement. However, the data does not show us what type and what credit or microfinance group are available in the community. This is vital as this might also a factor why people in the coastal area are poor because of its big interest as in the case of loan sharks. Furthermore, religious group have also a good impact in the community since this institution will help the community to have hope and values and continue to live despite of challenges they are facing.

Table 3. Household Social Assets

Household Social Assets	Frequency	Percentage
Livelihood Associations	14	74%
Credit or microfinance group	5	26%
Local Government	3	16%
Religious group	2	11%
Agric'l/livestock/fisheries producer's group	2	11%
Other Women's group	1	5%

Human Assets. Human assets are considered as the skills, knowledge, ability to work. It also includes the education, trainings, intelligence and health of a person (Kenton, 2020). Table 4 shows the disaggregated data on the educational attainment of the respondents and spouses. The data shows that 52% of the male are in the elementary graduates or have not finished elementary. This is just 16% in case of females. High school graduates and undergraduates is 35% for males while it is a remarkable 63% for females. For college graduate and undergraduate, females again have higher percentage (21%) than the 13% for males. Overall, there are more females that are well-educated than males. In the context of Masbate, majority of the males are the head of the family. The dismal educational preparation of the heads of the families might have been the cause of high poverty incidence among fisherfolks of Masbate.

Table 4. Household Human Assets

Household Human Assets	Male		Female	
Educational Attainment	Frequency	Percentage	Frequency	Percentage
College Graduate	1	3%	3	16%
College Undergraduate	3	10%	1	5%
High School Graduate	5	16%	5	26%
High School Undergraduate	6	19%	7	37%
Elem Graduate	8	26%	3	16%
Elem Undergraduate	8	26%	0	0

Financial Assets. Financial assets are the savings, access to financial services, and regular inflows of money. The data collected on the financial assets of the respondents are the regular inflows of money in the fisherfolks families. Data shows that majority or 68% of the income of the family are from husbands out of works in fisheries-related jobs. Some incomes are from services as laborer/unskilled workers and barangay kagawad. Torres et al (2019) reported an average household income of P10,271.26/month for the entire Asid Gulf. Considering the enormity of fisheries -related sources of income the beneficiary families are very vulnerable to adverse impacts of weather disturbances such as typhoons.

On the other end, 42% of the women are simply housewives and the remaining 58% have their other sources of supplementary income other than fishing. Thus, it helps the families to have other source of income. Nevertheless, the data on Table 5, highlights that the average family income of fisherfolks are indeed low.

Table 5. Household Financial Asset.

Female Occupation	Frequency	Percentage
Housewife	8	42%
Others	5	25%
No response/Unknown/Cannot Remember	2	11%
Officials of Government, Corporate Managers	2	11%
Day Care Worker	2	11%
Male Occupation	**Frequency**	**Percentage**
Fisherman	21	68%
Laborers/ Unskilled workers	2	6%
No response/Unknown/Cannot Remember	4	13%
Brgy. Kagawad	2	6%
Others	2	6%

Natural Asset. Natural assets are the resources that people can draw on for their livelihoods which comprise or land, forests, and water. So basically, as they are fisherfolks and living in the coastal area, their main natural asset is the body of water or the sea. According to the Fisheries Statistics of the Philippine year 2016-2018 report, the total area and the possible fishing ground for Masbate Fisherfolks along Asid Gulf 2476 km2.(see Dioneda et al, 2019) Moreover, the total hectarage of mangrove in the Asid Gulf is around 686 hectares and 61% of this mangrove is from one of the aquasilviculture sites which is the Municipality of Placer (Guiriba et al (2019).

Evaluation of the Livelihood Key Performance

To evaluate the performance of the aquasilviculture livelihood project, the methods in the manual of performance evaluation of IFAD (2015) was used. This evaluation manual is in line with the practices set out in OECD/DAC Glossary Key Terms in Evaluation and Results-Based Management. This is carried out as they would be useful in assessing the impacts of the project along social and economic status of beneficiaries and to identify input, output and outcomes.

For this purpose, this paper followed the evaluation base on impact and performance of the project namely: (1) relevance; (2) effectiveness; (3) efficiency; (4) impact; and (5) sustainability.

Relevance. According to manual subject IFAD performance evaluation manual, relevance is the extent to which the objectives of the development intervention are consistent with beneficiaries' requirements, country needs, institutional priorities and partner and donor polities. It also entails an assessment of project design and coherence in achieving its objectives. As assessment should also be made of whether objectives and design address inequality, for example, by assessing the relevance of targeting strategies adopted.

FishCORAL is a Philippine Government project funded by the IFAD. The project aims to reduce poverty incidence among rural areas specifically in the coastal communities while eyeing for food security and increase the household income to its target households. On the other hand, the IFAD is an internal financial institution and specialized united nation agency with goals and objectives to increase food security, improve nutrition and increase income among rural people. To achieve such, IFAD invest in rural people and empower them with different programs and projects. Furthermore, its projects aim to transform rural communities economically, socially and promote gender equality.

Following the above contention, FishCORAL project, specifically the livelihood engagements it rolled-out is very relevant to both objectives of inclusive development of the government and to the IFAD objectives. The aim to reduce poverty among rural people, particularly to the fisherfolk is the common goal of both. Livelihood projects like this aquasilviculture are very relevant specially in the case of Masbate province where incidence of poverty is high. Diversifying livelihood options is indeed a key step to open-up economic activities for the growing fishing communities. It is however important to stress that these economic opportunities are well planned and systematically implemented. Based on the FGD conducted, member beneficiary respondents hinted that the design on aqua silviculture project implementation was not appropriate. They simply find it hard to implement the project as some of its members are not serious about the project. It seems that there is insufficiency in the adapter association's readiness in running the project. They said that from a member of 45 only 10 members are participating in livelihood project and mustering cooperation of most of the members is indeed a struggle. They had these experiences before in several livelihood engagements rolled out to them by key government and non-government agencies. It is feared that after the FishCORAL project, the livelihood project will also die down. It was learnt that capability development and organizational preparation was inadequate as only few or the president of the association were allowed to attend the capability orientation and trainings.

Effectiveness. Effectiveness is the extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance. The objective of the FishCORAL project particularly aqua silviculture project is to provide livelihood and eventually provide additional income to the fisherfolks families, improve their living, and reduce poverty incidence. Nevertheless, the project on aqua silviculture did not help the fisherfolks in terms of their economic status since the project never make any money out of the labor of the member and finances/inputs given by the government. Out of 500 crablets released in the 500 square meter pond some group in Milagros, Masbate, only (5) crabs were harvested. in Placer, Masbate one group harvested nine (9), while the other group got nothing out of the stocks. Basically, the project is bound to fail as the associations could invest again for the next culture cycle. In this case funds for the procurement of more crablets, repair of enclosures and feeds for the crabs would indeed be a major impediment.

The respondent suggested that if the government will give them chance to have livelihood again, they will rather go for milkfish or tilapia culture. They argued that crab culture under the aquasilviculture scheme would be very hard for the associations without the conventional earthen dike of ponds. This point further confirmed the lack of readiness and insufficient knowledge on cultural management of mudcrabs under aquasilviculture model of the associations. This can be further traced from failure of appropriate agencies to capacitate fully the groups of beneficiaries, squabbles inside the associations and lack of business plan to guide the project to sustainability.

However, on the goal of the project to protect the existing mangroves in their livelihood, the project seemed to have contributed to achieve this as the project is lodged right at the heart of the mangrove forest that are protected from cutting and other disturbances.

Efficiency. This provides a measure of how economically important resources/inputs (funds, expertise, time, etc.) are converted into results (IFAD, 2015). The researchers were not provided with the copy on the financial report of the project, despite of repeated requests. However based on the actual interview with beneficiaries in focus group discussion, they say they don't have any profit out of the expenses and labor investments for the project because of the dismal harvest they got out of the production cycles they had. The presidents of the two recipient organizations in Placer, reiterated the dismal harvest they had. This was about the 5-9 crabs harvested out of 500 crablets stocked. This is worse than the experience about aquasilviculture in the province of Bataan that only harvested 28 % crabs from the 300 crablets stocked (Flores et al, 2015).

Impacts. The household income, poverty reduction, and women empowerment are parts of the assessment of the social and economic impacts of aquasilviculture livelihood projects. Furthermore, this part of the discussion also infers the lessons gained from the implementation of the project. The Impact is defined as the changes that have occurred or are expected to occur in the lives of the rural poor (whether positive or negative, direct or indirect, intended or unintended) as a result of development interventions (IFAD, 2015). For this study the following impacts were evaluated (1) household income; (2) poverty reduction; (3) women empowerment; and (4) enterprise development

Household income. Based on the data collected from the respondents or aqua silviculture beneficiaries, 8.8% or 3 out of 34 beneficiaries have income from the project in aqua silviculture with a mean income of P650.00 for 6 months project duration. This income is very far from their income from other sources. In as much as the harvest was very poor, it is indeed expected that the project would have negatively impacted the income of the households. This is so as the time investment of the fisherfolks that ended-up on losing ends is an outright loss economic opportunity (i.e., forgone economic benefit) as the fisherfolks could have attended to other more economically productive engagement.

Poverty Reduction. Based on the report of 2018 official poverty statistics of the Philippines in the province of Masbate, the result of the study shows that there are still large number of poverty incidence among the beneficiaries of the aquasilviculture project. In the table below it shows that 91% or 31 out of 34 families experience poverty based on income approach. This went down a bit to 88% or 30 out of 34 families who experience poverty based on expenditure approach. On the other hand in subsistence incidence the data shows that 74% or 25 out of 34 families experience poverty based on income approach while 67% or 23 out of 34 families experience subsistence based on expenditure approach. Using a threshold of ₱2,257 as the per capita poverty threshold per month (from Family Income and Expenditure Survey for a household with five members, 2018), it was revealed that 64% of the households in Asid Gulf are poor (Torres et al (2019). This is comparably higher than the average poverty incidence in province (33% in 2015 to 29.4% in 2018). This poverty threshold is higher compared to the 42% baseline of the FishCORAL project. Specific to the two municipalities, the same report in 2019 estimated poverty incidence specific in Milagros to be at 61% while in Placer, 65%.

To tap it all, the aquasilviculture could hardly contribute to reduce poverty incidence by 5% from the 42% baseline since the project did not yield productive harvest on their operations. It is noteworthy to mention though that the project has just started operations in 2020, hence full economic impact leading to poverty reduction maybe too untimely to do. But the lessons in the initial operations are vital and obviously be direct impediments for a socially and economically productive and sustainable livelihood of the community.

Table 6. Poverty Incidence

Poverty Measure	Poverty Incidence (%)	Subsistence Incidence (%)
Income Approach	91	74
Expenditure Approach	88	67

Source: PSA 2018

Women empowerment. To measure women empowerment, this study used the Women Empowerment in Agriculture Index (WEAI). In order to conclude if the woman is empowered or not, the respondents must attain adequacy rating of 80% or more of the weighted indicators. The indicators are the five domains of empowerment (5DE), the production, resources, income, leadership, and time.

Table 7 presents the summary of the computations for the indicators of WEAI of the aqua silviculture beneficiaries. It shows that in some indicators, women are empowered. It shows that there are more women who attain desirable level of empowerment in terms of ownership of assets, access to decision on credit, control over the use of income, leadership and time. However, based on the overall 5DE there are only 26.32% or 5 out of 19 women are empowered. Perhaps the reason why these women are not yet empowered because there are less project/activity being given to the women beneficiaries. Likewise, the dismal harvest manifested its impact here, as women empowerment level was very low in terms of production (5.3-36.8) and in purchase, sale, or transfer for assets (47.4). In terms as well of time or workload investment of women, very little is afforded to them (57.9).

Table 4. Women Empowerment Ration

Indicators	Empowerment Ratio	Disempowerment Ratio
Production		
Input in productive decisions	36.84	63.16
Autonomy in production	5.26	94.74
Resources		
Ownership of assets	63.16	36.84
Purchase, sale, or transfer for assets	47.37	52.63
Access to and decisions on credit	68.42	31.58
Income		
Control over the use of income	73.68	26.32
Leadership		
Group member	73.68	26.32
Speaking in public	73.68	26.32
Time		
Workload	57.89	42.11
Leisure	78.95	21.05
Disempowerment Headcount Ratio	73.68	
Empowerment Headcount Ratio	26.32	

Sustainability. To probe the long-term productive economic activity of community through the aqua silviculture project, aspects of sustainability were assessed. According to the IFAD evaluation manual (2015), sustainability is the likely maintenance of net assistances from a development intervention beyond the phase of external funding support. There is the emphasis here of the project to become self-sustaining using the initial seed money provided from the project under the FishCORAL scheme. This simply mean that the project is expected to be operating on succeeding production cycles using the revenues it would generate from previous/initial operation/s. Sustainability also includes an assessment of the likelihood that actual and anticipated results will be resilient to risks beyond the project's (FishCORAL) life. Based on their present status, the project on aqua silviculture in Milagros and Placer, Masbate, will unlikely to continue on a long term since the implementers are not equipped on technical and entrepreneurial capabilities to run the project on productive ends. The organizations need to fix the lack of cohesiveness to implement the project fueled further by the dismal turn-out of the initial production operation. In fact some of the member beneficiaries already backed-out from the project. However, if the DA-BFAR will still allocate fund for the production inputs of the next cropping cycle, these organizational dilemmas shall first be addressed. Certainly, it would not be going anywhere if the same scheme will prevail. There are lots of rebuilding and overhauling of the project plan and the capability enhancement of the recipient organizations before further support (again) from the government is made possible

Conclusion and Recommendations

Conclusion

The study assessed the economic and social impacts of the aqua silviculture beneficiaries in the municipalities of Placer and Milagros. The livelihood recipient families have bigger family memberships and generally low income. This makes resulted to high poverty incidence in the subject households.

The result also shows that the respondents does not have their own lot or real property where their houses were built on. Majority of the beneficiary household draw their drinking water from the unprotected deep well which is vulnerable to contamination and could be a health hazard. It was also revealed in the study that even the main source of income of the family is fishing their convenience assets are less useful in their livelihood. The connection and membership to associations and credit groups are notable remarks on the social assets.

Most of the respondents and their spouses do not have enough educational preparation with high school as the highest attainment and with only 13% of them reaching or finishing college degree. The variety of possible source of income, respondent households have several alternative livelihoods to supplement income from fishing, especially during lean months. Natural assets such as the huge fishing area and expansive mangroves and other coastal habitats abound.

The project performance was evaluated based on the five point criteria of IFAD. In terms of relevance, the conceptual objective of the FishCORAL-supported livelihood is very consistent to poverty alleviation and inclusive development. Aquasilviculture could further widen economic opportunities in the community. But it seems that the beneficiary associations are not ready and prepared for the livelihood project as evidenced from the dismal harvest they generated and the apprehensions now of some members to continue their engagement. The project is also neither effective based on the dismal performance during harvest. A good consolation though is that the aquasilviculture set-up may have protected the mangroves from further perturbation as mere presence of the project and the monitoring association would have prevented varied forms of human perturbations. The aquasilviculture project on its short implementation became inefficient as it failed to translate the financial investment into income. It is now a big issue for the association on where they would source out all the required production inputs if ever they would embark again for another cycle.

The impacts of the project were evaluated based on varied criteria as well. Very little to almost none in terms of household income was generated by association members in the first culture cycle. In fact with the poor harvest the project would have negatively impacted the income of the households. The time they invested for the culture that ended-up on losing end can be considered forgone economic benefit if it had been invested to something else. The aquasilviculture could hardly contribute to the reduction of poverty incidence by 5% from the 42% baseline since the project did not yielded productive harvest on their operations. It is noteworthy to mention though that the project has just started operations in 2020, hence full economic impact leading to poverty reduction maybe too untimely to do. In terms of women empowerment, the aquasilviculture just translated to 26.32% empowerment level which is still very low from the empowerment adequacy rating reference of 80%.

The project on aqua silviculture in Milagros and Placer, Masbate, is not likely to continue on a long term since the implementers are not equipped on technical and entrepreneurial capabilities to run the project on productive ends. The organizations need to fix the lack of cohesiveness to implement the project fueled further by the dismal turn-out of the initial production operation. In fact some of the member beneficiaries already blacked-out from the project. There are lots of rebuilding and overhauling of the project plan and the capability enhancement of the recipient organizations before the association ventures for the next culture.

Recommendations

Based on findings and conclusions, the following are hereby recommended: Conduct of more technical capability training along varied aspects of aqua silviculture shall be caried out. Also, trainings on financial literacy, business management and basic record keeping are very necessary. Crafting of clearcut guideline and operational protocol to guide the aqua silviculture ventures to productive operation. Maybe, a root cause analysis of the previous production cycle should be carried-out to highlight lessons and undertake corrective measures. The association must be reorganized, reoriented and retooled. Values formation shall be infused before giving the livelihood is a must for the sustainability of the project.

Acknowledgement

This research paper would not have been completed without the complementarily support of a few number of instruments whom the researcher wishes to acknowledge. First for the institution where the researcher receded, the Dr. Emilio B. Espinosa Sr. Memorial State College of Agriculture and Technology through responsible personnel, to the Bicol University in the person of Dr. Ronnel R. Dioneda, Sr. as Research Director of the institution in allowing us to be part of this important research in the field of livelihood. To the Local Government Unit of Milagros and Placer for warm accommodation and assistance in conducting the study, to the DA-BFAR for allowing us to conduct the impact assessment. Lastly, for the Lord, Jesus for making this thing happen.

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Development of Buttons Using Plastic Wastes

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Abstract - Buttons are one of the important elements used in clothing and art crafts. This study focused on the development of buttons using plastic wastes as fasteners and embellishment for garments and other artistic work. Some of the possible beneficiaries of the product are apparel industries and craftsmen. Likewise, it supports the advocacy of plastic waste reduction. The developed product was made from shampoo sachets and polyethylene terephthalate (PET) bottles. PET bottles and shampoo sachets were formulated in a ratio of 50:50 to form a plastic tile. Plastic wastes were mixed, compressed, and moulded in a two-roll mill with 260°C temperature. The formed tiles were drilled into round disk-shaped with four (4) holes in the middle. The buttons were polished and designed to enhance their appearance. The button tile was subjected to the test of tensile strength or the ASTM D638 method to determine the brittleness, strength, and ductility of the product. The result of tensile strength and tensile break of the PET and shampoo sachet mixtures was 7.31Mpa while its elongation at break has a percentage of 0.452% and modulus of elasticity with an average mean of 2.66Gpa. This result shows that the formulated plastic waste can withstand as button material at 387.703N of force. However, the original quality of virgin polyethylene terephthalate (PET) was not retained due to other forms of plastic wastes added.

Keywords - Plastic waste; buttons; plastic waste buttons

Introduction

It is impossible for people to end one day without using plastic and to avoid plastic waste, either. Plastic is inevitably passed through from peoples' hands throughout the day. The low cost of plastic sachets in the Philippines and the neglect of the people where it is to be discarded. In the Philippines, according to The World Bank Organization (2021), the plastics industry that contributes about US$2.3 billion in 2018 is not only vital to the national economy, but plastics also provide low-cost consumer goods to poor and middle-income families. However, high dependence on single-use plastics like multilayer sachets and pouches has led the Philippines to become a "sachet economy" that continues to worsen the alarming levels of marine plastic pollution in the region. By some estimates, the Philippines consumes a staggering 163 million pieces of sachets every day. In effect, it made the Philippines as one of the plastic pollution contributors, which harms the environment (The Scourge of Single-use Plastic in the Philippines, 2018).

In recent report of Tiseo 2021, the global plastics production totaled 368 million metric tons in 2019. It is estimated that production in 2020 decreased by roughly 0.3 percent due to the COVID-19's impacts on the industry. Most of these plastics are polluting the ocean and waterways with inefficient standard practices and measures for proper disposal. Plastic sachets and PET bottles are single-use plastic. Plastic sachets are designed to contain an intended amount of liquid or powder. These sachets are small sheets of plastic, versatile and flexible plastic pouches that are used as a container for shampoos, detergents, toothpaste, and food products. These products are all fast-moving consumer goods that can accumulate waste daily (Nulkar, 2016). These plastics are single used as well as PET bottles, recyclable but not reusable. According to Jambeck, Andrady, Geyer, Narayan, Perryman, Seigler, Wilcox, Lavander (2015), the exact amount and location on where plastic debris that ends in the ocean is still uncertain, despite the amount of progress in technology. In 192 coastal countries in 2010, there are about 275 million metric tons (MT) of plastic waste accumulated. Due to the plastics' versatility and fast production, plastics have momentarily increased and immensely used for packing goods or any material. Making it a great commodity one of which are polyethylene terephthalate (PET) and plastic sachet pouches.

The Philippines has generated so much plastic waste; however, these wastes are not always being used for something more beneficial to the community. Plastic sachets and PET bottles according to Kumi-

LarbiJnr, Danladi, Kamsouloum, Websterb, Wilson, Cheeseman, (2018) are one of the major problems, not only in the Philippines, as well as in other countries, because of the poor collection and recycling systems that cause adverse effects on the environment. Plastics of less than five millimeters long have arisen; also more massive plastic waste contributed a lot to microplastic pollution (Gross, 2015).

Concerning the problem discussed above, the researchers were encouraged to come up with a product that utilizes plastic wastes into buttons as fasteners or embellishments. It aims to benefit the fashion industry and other craftsmen as add-on trimming materials for their use. Likewise, the study is also concerned with the reduction if not eliminated the pollution caused by plastic waste such as PET bottles and plastic sachets.

The general objective of this study was to develop buttons using plastic waste as fasteners and embellishment. Specifically, the study aims to (1) Process the plastic sachet wastes through a plastic shredding machine; (2) Formulate the mixture of plastic to form the buttons (3) Test the tensile strength of the formulated products in standard tensile testing (4) Evaluate the acceptability and performance of the buttons.

Methodology

The product design is a four-holed disk-shaped button with 22 mm diameter and 3mm thickness as shown in Figure 1. The buttonholes measure 2mm in diameter and 2mm apart from each other.

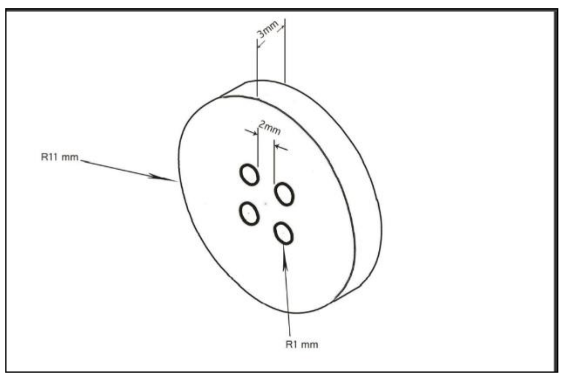

Figure 1. Plastic Waste Button

Project Development

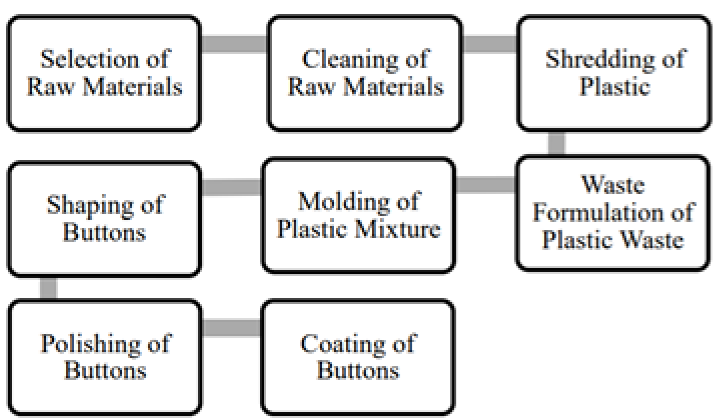

Figure. 2. Process of Button Development

Figure 2, as shown above, was the process of button development from plastic waste. First (1), the plastic sachets and polyethylene terephthalate (PET) bottles were collected and selected. The conditions needed in selecting the raw materials must be considered before shredding. For Polyethylene Terephthalate (PET) Bottles, clear bottles are required. No colored bottles should be included. The bottles used were whole and intact and tattered bottles were removed. And for Sachets, it used shampoo sachets only. Shampoo sachets were clean and free from dirt and other liquid substances.

Second (2) The plastic shampoo sachet and Polyethylene terephthalate (PET) bottles were cleaned. All sample materials, the PET bottles and shampoo sachets must wash with soap and water thoroughly. Then, dry the raw materials under the sun. The raw materials were cleaned and free from any dirt and liquid substances. The third step (3), was the shredding process of the materials. The raw materials were cut to the specific sizes needed for molding. The plastic shampoo sachet was cut into a confetti size while the Polyethylene terephthalate (PET) bottles were cut at least 3x3 cm. The neck and the base of the bottle were removed before cutting. Then, sachets were added to the shredder bike.

The fourth step (4), was the formulation of 50% PET bottles and 50% shampoo sachet plastic mixture. The needed weight for each tile is 150 grams. Then, extra 5grams were added for allowances. The 80grams of shredded plastic sachets and 80 grams of cut PET bottles were prepared. In the fifth step (5) the plastic mixture was mixed using a two-roll mill machine. The 80g PET plastic was placed in a two-roll mill machine with a temperature of 260oC until melted. Then, the shredded plastic sachets were added to the two-roll mill. After the plastics were mixed, the mixture is placed in the compression machine to form an 8 x 8” tile.

After which, the sixth step (6) was shaping the tiles to buttons through drilling using a hole-saw and a 2mm small drill bit to cut the tiles into a disk shape. The disks were refined with sandpaper to remove the excess plastics. Then, the stencil was placed on top to guide the drilling of four holes using a 2mm drill bit.

Next, the seventh (7) step was the finishing of buttons through polishing and removing excess plastics and cleaning by washing using a soft sponge. The buttons were polished using 60-grit sandpaper and finer 120-grit sandpaper to remove the scratches of the buttons. Buttons are washed using a sponge and liquid dishwashing soap. Then, let it dry for a few minutes. Lastly, (8) was a coating of buttons with plastic primer and acrylic spray paint. The buttons were sprayed with plastic prime, then, dried for 10 minutes for each side. After applying the plastic primer, buttons must be coated with acrylic spray paint. Then again, dried for 4-5 hours. Repeat the process on the other side. A second coat is added if necessary to make the surface more pleasing,

To ensure the quality of the buttons, the product is subjected to tensile testing or the ASTM D638-08 method. The following were the procedures in conducting the ASTM D638-08 method for semi-rigid materials: (1) Cut the material into 7-10 pieces of dumbbell shape with 115 cm long and 25 cm width. (2) Placed plastic dumbbell shape on tensile grips. (3) Set and tuck the dumbbell plastic in the extensometer. (4) Then, started the test with the separation of tensile grips and a constant rate of speed. The speed depended on the thickness of the dumbbell shape used. (5) If the material cracked, this was the signal that the test has been completed.

Results and Discussions

The button product is a disk-shaped plastic material with a four-holed button and measures 22 mm in diameter and 3mm in thickness. The product was designed for garment producers and other art and craft industries as decorative buttons and fasteners for the garment industries. As shown in Figure 3, presented the actual picture of the final product and polished buttons are painted with acrylic.

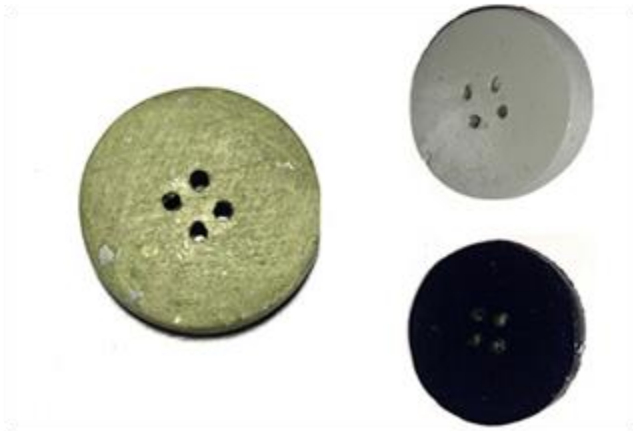

Figure 3. Four-Holed Buttons from Plastic Waste

The test performed in the buttons was the tensile test or the ASTM D638 method. The result was shown in Table 1 below.

Table 1. Test Results of PET and Shampoo Sachet Mixture

Sample Code	**PPT-2018-1430**	**Common Values Ranges**
	M	SM
Tensile Strength (MPa)	7.31	48-103
Tensile Stress at Break (MPa)	7.31	48-103
Elongation at Break (%)	0.452	2 – 125
Modulus of Elasticity (GPa)	2.66	9.67

Legend:
SM – Standard Mean Average
M – Mean Average

Ten specimens were subjected to a tensile test with a speed of 50mm/min. The tensile strength and tensile break of the PET and shampoo sachet mixture are 7.31MPa as compared with the standard values and range from 48-103MPA. The result implies that the tensile strength and tensile breakage degraded due to the percentage of plastic sachet mixture. The elongation at break has a percentage of 0.452% compared with its common values and ranges from 2-125%. The data show that there is a degradation of quality in PET with the recycled and mixed plastics but still has good tensile strength since the mixture is 50%:50%. The specimen did not yield due to the polyethylene terephthalate's (PET) brittle nature. As a result, the plastic tiles can be broken easily before it was shaped into the disk. However, it cannot break after it was turned into a button material. Modulus of elasticity has an average mean of 2.66GPa, and this indicates that the plastic tiles were bent easily with less force as compared to the common value and ranges of 9.67GPa.

The buttons are presented to 25 respondents that include students and professors who are the possible end-users of the product. Evaluation is done to review the quality, capability, and acceptability of the buttons. The criteria for evaluation range from 5 being the highest and 1 being the lowest. The results of the evaluation are summarized in the table below.

Table 2. Summary of Acceptability Evaluation

Criteria	Mean	Interpretation
Aesthetic	4.25	Very Acceptable
Durability	4.47	Very Acceptable
Safety	4.52	Highly Acceptable
Economy	4.72	Highly Acceptable
Salability	4.57	Highly Acceptable
Overall Mean	4.51	Highly Acceptable

In Aesthetic, the color appeal, the attractiveness of the design, and appropriateness of the design got an average mean of 4.25 with a descriptive rating of "Very Acceptable." It implies that the button was appealing despite its limited color. The criteria of the durability of the buttons include the quality of materials needed, quality of artistry, and quality of design. Durability had an average mean of 4.47 with a descriptive rating of "Very Acceptable." It means that the product was good to use as an embellishment. Safety consists of toxic hazardous materials and the absence of sharp edges. Safety has an average mean of 4.52 with a descriptive rating of “Highly Acceptable." This result shows that the button is not harmful to use. The economy has criteria that contain the economy in terms of materials needed, time/labor spent, and machine/s required. The result has an average mean of 4.72 with a descriptive rating of “Highly Acceptable." It indicates that the time spends on developing the product is efficient and fast.

The salability cover presence of market demand, accessibility to finished product and competitiveness of price. The average mean for salability is 4.57 and a descriptive rating of “Highly Acceptable." The product can compete in the market due to its environmentally friendly materials and cost. The overall mean of the evaluation is 4.51 with a descriptive rating of "Highly Acceptable." This result shows that the button made from plastic waste can be used as embellishment and fasteners.

Conclusion and Recommendations

In summary, the button product measures 22mm in diameter and 3mm thick disk-shaped plastic made from 50% polyethylene terephthalate (PET) and 50% shampoo sachets. PET of all plastics is the most recyclable; however, plastic sachets are less developed due to their thermoset plastic characteristics. The plastics were mixed and molded to form the tiles and shaped into a disk-like. Then, drilled with four holes and painted with acrylic to achieve its button-like appearance. The product went through a tensile strength test to determine capability and quality to stand with the characteristics of a garment button and as an embellishment for other purposes. Also, the plastic button was evaluated of 25 respondents composed of 20 fashion students and 5 professors and gave an overall mean of 4.51 with a descriptive rating of “Very Acceptable”. Thus, the buttons are recommended as fasteners and embellishments.

These conclusions are derived from the objectives of the study and the results of the test and evaluation conducted: (1) Shredding the plastic sachet waste into a pulverized state is almost improbable due to the shredding machine's limitation. (2) Formulating 50:50 ratios of polyethylene terephthalate (PET) bottles and plastic shampoo sachet can produce a sturdy plastic that can withstand 387.703N of force. (3) The original quality of a virgin polyethylene terephthalate (PET) was not retained due to added other forms of plastic waste. (4) The evaluations result shows a descriptive rating of “Very Acceptable” that the buttons are a durable, reliable and sustainable source for garments.

Acknowledgement

Standards and Testing Division (STD) of the Industrial Technology Development Institute (ITDI) under the Department of Science and Technology support in the conduct of the study is gratefully acknowledged.

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Clinical application of whole-genome sequencing in hypertrophic cardiomyopathy: a family case report

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Abstract - Background: Hypertrophic cardiomyopathy (HCM) is the leading cause of sudden cardiac death in young people, characterized by left ventricular walls of the heart be abnormally thickened and is one of the most common genetic cardiovascular diseases. Whole genome sequencing (WGS) is a new generation sequencing technique that allows researcher identify any genome variation. To provide clinical data and WGS data of a Vietnamese family with HCM. The proband and three of her family members including her parents and her sister were recruited. Clinical assessment including physical symptoms, 12-lead electrocardiogram (ECG), echocardiography, and cardiac magnetic resonance. Genomic DNA of the proband and her family members was extracted from venous blood samples, performed whole genome sequencing and Sanger sequencing to confirm. The proband and the proband' father were rare cases of HCM in Vietnam carrying the MYBPC3 heterozygous mutations in MYBPC3 gene (c.G2308A, p.Asp770Asn), one of the most well-known genes causing HCM. In addition to clinical data, genetic polymorphisms associated with other diseases have also been reported. By applying whole-genome sequencing techniques and bioinformatics tools, genetic variants on the genes that cause HCM have been identified. This result is the premise for further studies on HCM. Besides, developed genome profiles will support health care in the direction of personalized medicine.

Keywords - Case report, hypertrophic cardiomyopathy, MYBPC3, whole-genome sequencing

Introduction

Hypertrophic cardiomyopathy (HCM) is characterized by the left ventricular wall of the heart be abnormally thickened, which reduces the heart's ability to pump blood. Disease expression on echocardiography or magnetic resonance imaging is any segments of left ventricular wall being equal or thicker than 15mm without every different cause that could result in secondary hypertrophy. It is an autosomal dominant disease with variable penetrance in at least 50% of cases. The estimated HCM prevalence is 1 case per 200 - 500 persons, thus, there are approximately 20 million people affected worldwide [1]. Clinical symptoms are variable, ranging from asymptomatic to severe heart failure or even sudden cardiac death (SCD). Factors that increase the risk of SCD include maximum wall thickness, family history of SCD, left atrial diameter, and non-sustained ventricular tachycardia [2]. Individuals with this disease should adjusting their lifestyle adjusted such as limiting physical exertion, pharmacotherapy, or invasive procedures for example ICD implantation, surgical septal myectomy, and alcohol septal ablation [3].

Whole genome analysis is becoming a powerful tool in medicine. The next- generation sequencing technology allows to identify genetic mutations which has been increasingly utilized in the diagnosis of congenital faults of cardiovascular diseases [4]. Core genes for HCM include ACTC1, ACTN2, ANKRD1, CSRP3, GLA, JPH2, LAMP2, MYBPC3, MYH7, MYL2, MYL3, PLN, PRKAG2, TCAP, TNNC1, TNNI3, TNNT2, TPM1, TTR [5] [6]. About 83% of HCM cases have pathogenic or likely pathogenic variants in the genes MYH7 and MYBPC3, while others account for only 2% for each gene [6]. Genetic testing in those studies employed Sanger sequencing or next-generation sequencing for a limited number of genes. Besides, genetic cardiomyopathy has a significant complexity, as shown by the overlap in phenotype as well as the overlap of genes [7]. The next- generation sequencing with the advantage of allowing information to be extracted from any gene will provide us a clearer view of the relationship between genotype and phenotype. Here, we report an HCM-family case using next generation sequencing to explore the targeted pathogenic variants that could potentially be used to predict HCM.

Methodology

Ethical compliance. This is a research collaboration between Vietnam National Heart Institute, Bach Mai hospital and VNU - University of Medicine and Pharmacy, Hanoi, Vietnam which was conducted from August 2019 to April 2020. The proband and her three family members including her parents and her sister were recruited. The study protocol was approved by the Ethic Committee at University of Medicine and Pharmacy - Vietnam National University, Code IRB-VN01016.

Clinical assessment. All the subjects were comprehensively assessed by experienced cardiologists in Vietnam National Heart Institute, Bach Mai Hospital with physical examinations, 12-lead electrocardiogram (ECG), 24-hour ambulatory ECG and echocardiography. Subjects diagnosed of hypertrophic cardiomyopathy had been examined by cardiac magnetic resonance (CMR) to redefine the definitive diagnosis and morphology characterization. Echocardiography and CMR index were re-evaluated by an echocardiologist and a cardiovascular imaging specialist. Subjects' demographic, medical and family history information were also collected. The diagnosis criteria were based on European Society of Cardiology (ESC) guidelines 2014 of HCM – for proband, the wall thickness of any left ventricular myocardial segments was at least 15 mm without any other secondary causes explaining for hypertrophy and □ 13 mm for proband's relatives.

Whole-genome sequencing (WGS). Genomic DNA was extracted from venous whole blood samples by using the QIAamp DNA Blood Mini Kit (Qiagen Inc., Germany) following the manufacturer's recommended procedure. The quality of extracted DNA products was analyzed by electrophoresis on a 1% agarose gel and quantified by spectrophotometer at OD280 and OD260 (NanoDrop Technologies Inc., USA). WGS was performed by Genewiz Suzhou Inc., (China) on the HiSeq X platform at 150 bp paired end (PE).

Bioinformatics analysis. Reads were aligned to the human reference genome version hg38 using Burrows–Wheeler Aligner [8]. Single-nucleotides variants (SNVs) and short insertions and deletions (Indels) of nucleotide fragment less than 50bp were detected using the GATK toolkit version 3.6 following its best practice procedure [9, 10]. Called variants with a depth coverage of smaller than were included for the downstream analysis. We used SnpEff [11] and Annovar [12] programs to annotate the variants. The deleterious impacts of the variants were predicted by computational methods including SIFT [13], Polyphen2 [14], and MutationTaster [15]. The allele frequencies of variants were obtained from the 1000 Human Genome Project database [16], gnomAD database [17], and the Vietnamese genome database [18]. The variants with minor allele frequencies greater than 1% in any databases were excluded from downstream analyses. Finally, the pathogenicity of the variants was annotated by the Human Genome Mutation Database [19].

Sanger sequencing. A fragment of MYBPC3 gene, 496 base pairs in length, was amplified using PCR (forward primer: 5′ CTGACTTGGATCTCACCC 3′; reverse primer: 5′ ACCATCTTCTCAGCCTCC 3′) [20]. Next, the PCR products were purified by PCR E.Z.N.A® Cycle-Pure Kit (Omega-Biotek Inc., USA) and sent for Sanger sequencing by 1st Base Laboratories Sdn. Bhd. (Malaysia). Sequence analysis was performed by a BLAST search in the GenBank database (http://www.ncbi.nlm.nih.gov) and BioEdit version 7.1.9 software, thereby identifying the patient's genotypes.

Results and Discussions

All of the subjects were performed with physical examinations, electrocardiograms, echocardiography and genetic testing. Demographic, clinical symptoms, ECG, echocardiography, CMR and genetic characteristics of the proband and her family members were shown in Table 1.

Table 1 Clinical and genetic characteristics of the proband and her family members

	Subject II.2	**Subject I.1**	**Subject I.2**	**Subject II.1**
Demographic characteristics and physical examinations				
Relationship	Proband	Father	Mother	Sister
Age	19	53	50	26
Age at diagnosis	10	53	-	-
Gender	Female	Male	Female	Female
Symptoms	DOE, chest discomfort	DOE	None	None
Syncope/ Presyncope	None	None	None	None
Electrocardiography (ECG)				
12-lead ECG	NSST-T	RBBB, first degree AV Block	NSR	NSR
24-hour ambulatory ECG	Paroxysmal AF, NSVT	NSVT	-	-
Echocardiography				
Maximal wall thickness (mm)	28.36	14.26	7.3	6.5
Left ventricular outflow tract pressure gradient (mmHg)	7.9	0	0	0
Diastolic dysfunction	Grade I	Grade II	None	None
LV ejection fraction (%)	63	56	65	67
Cardiac Magnetic Resonance				
Maximal wall thickness (mm)	20.2	15	-	-
LV ejection fraction (%)	57.9	56.9	-	-
Phenotype*	Type II	Type I	-	-
LV geometry	eccentric	eccentric	-	-
Diagnosis and Management				
Diagnosis	HCM	HCM	Normal	Normal
Treatment	Beta-blockers, aceno-coumarol	Beta-blockers	None	None
Genotype				
rs36211723 (*MYBPC3)*	G/A	G/A	G/G	G/G
rs1815739 (*ACTN3*)	C/T	T/T	T/T	C/T

DOE, Dyspnea on exertion; HCM, Hypertrophic Cardiomyopathy; NSST-T, Non-specific ST-T segment; RBBB, Right Bundle Branch Block; AV, Atrioventricular; NSR, Normal Sinus Rhythm; AF, atrial fibrillation; NSVT, Non-sustained Ventricular Tachycardia; LV, Left ventricular.
* Macron classification (1981)

Proband clinical data. The proband (subject II.2) was a 19-year-old female who comes to hospital because of dyspnea on exertion and angina. She experienced the first symptom when she was 10 years old, and was diagnosed with hypertrophic cardiomyopathy by echocardiography at the age of 11. Her ambulatory electrocardiogram (ECG) showed paroxysmal atrial fibrillation. She was treated with beta-blocker agent together with acenocoumarol agent and monitored every 6 to 12 months. At the time of the research, her heart rate was 65 beats per minute, blood pressure was 120/80. The ECG showed non-specific ST-T changes with ST depression in lead V4-V6 (Fig.1). Her echocardiography showed mid-interventricular septal, anterior and inferior septal hypertrophy with the thickest diameter being 28.36 millimetres, systolic anterior motion (SAM) sign, mild mitral regurgitation, and severe left atrium dilation (Fig. 2). The abnormal morphology and function were confirmed by cardiac magnetic resonance (CMR), which also depicted inter-ventricular septal hypertrophy with mild left ventricular outflow tract (LVOT) obstruction. The maximal thickness was 20.2 mm on CMR. Additionally, CMR showed diffuse and patchy patterns of late gadolinium enhancement (LGE) predominantly in mid-basal anterior and posterior walls (Fig. 3).

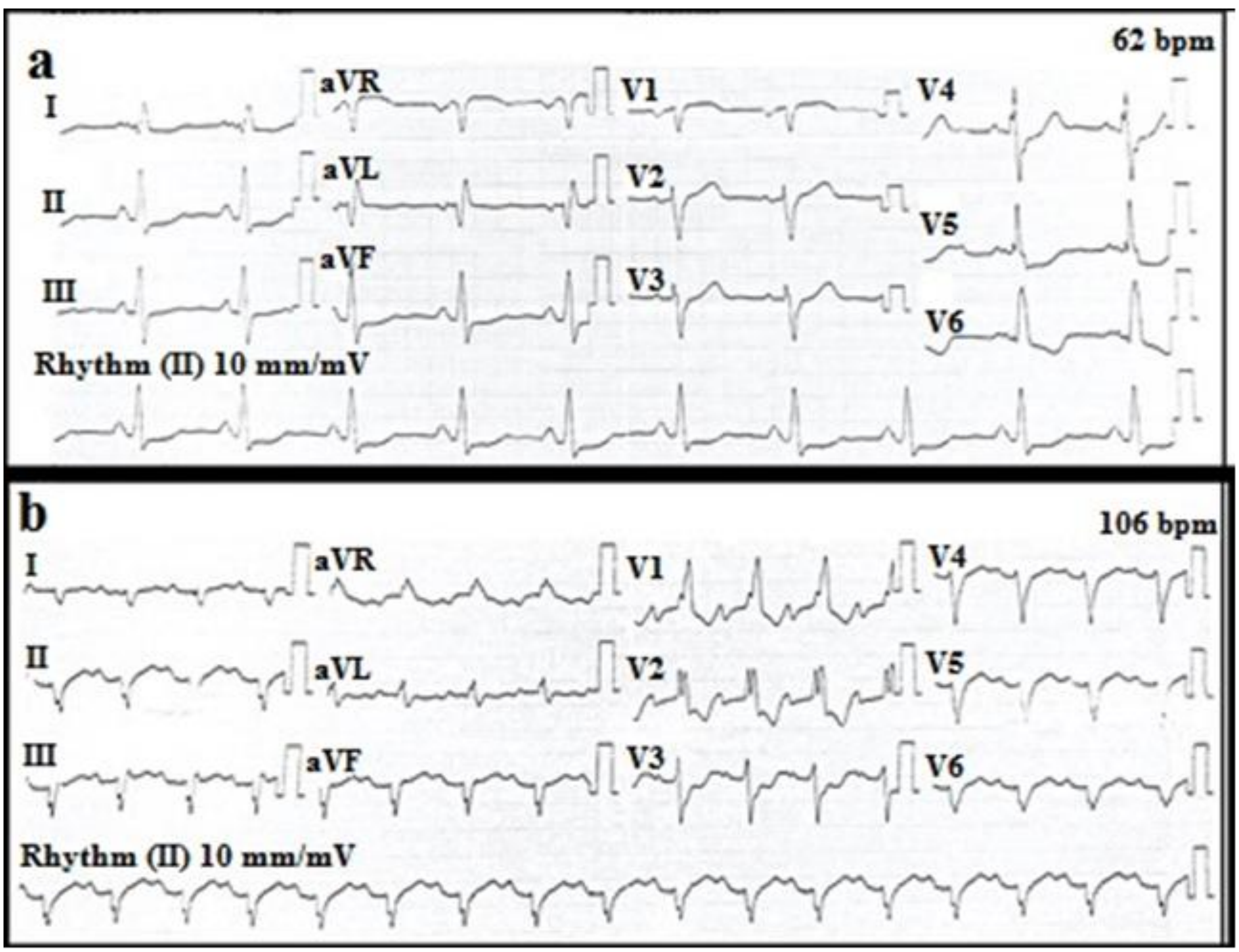

Fig. 1. ECG of subjects carrying pathogenic variants (the proband and her father).
a The ECG of the proband showed non-specific ST segment depression in lead V4-V6.
b The proband's father had the ECG of a Right Bundle Branch Block associated with a first -degree atrioventricular block and an extreme axis deviation.

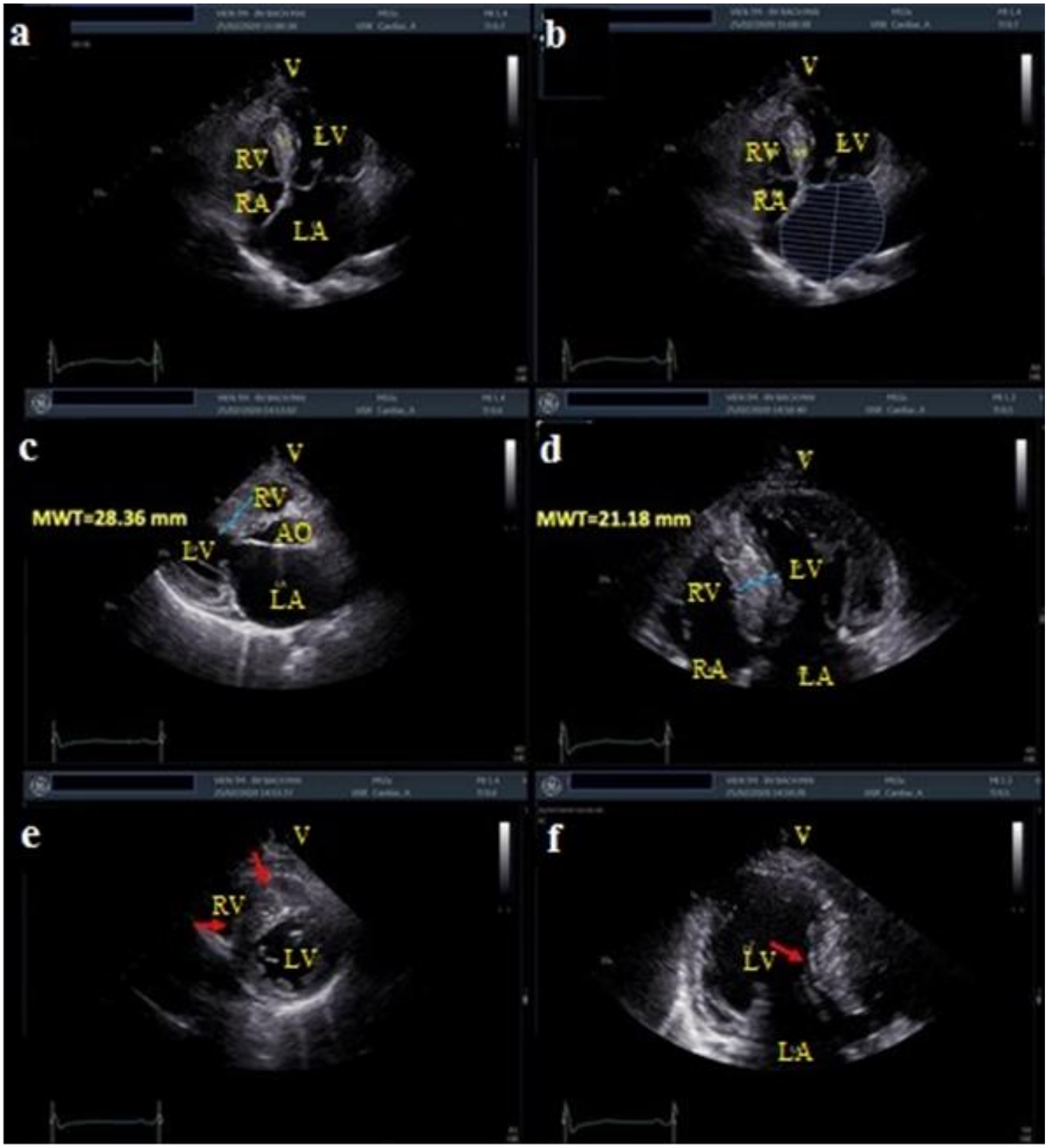

Fig. 2. Transthoracic echocardiogram of the proband. a, b An apical 4-chamber view showed mid-septum hypertrophy and left atrial (LA) enlargement with an increased LA volume index (131 ml/m2). c, d Maximal interventricular septal thickness was seen on parasternal long axis view (28.36 mm) and apical four chamber view (21.18 mm). e Parasternal short axis view of anterior septal and inferior septal hypertrophy (red arrows). f An apical three-chamber view showing anterior wall hypertrophy (red arrow).

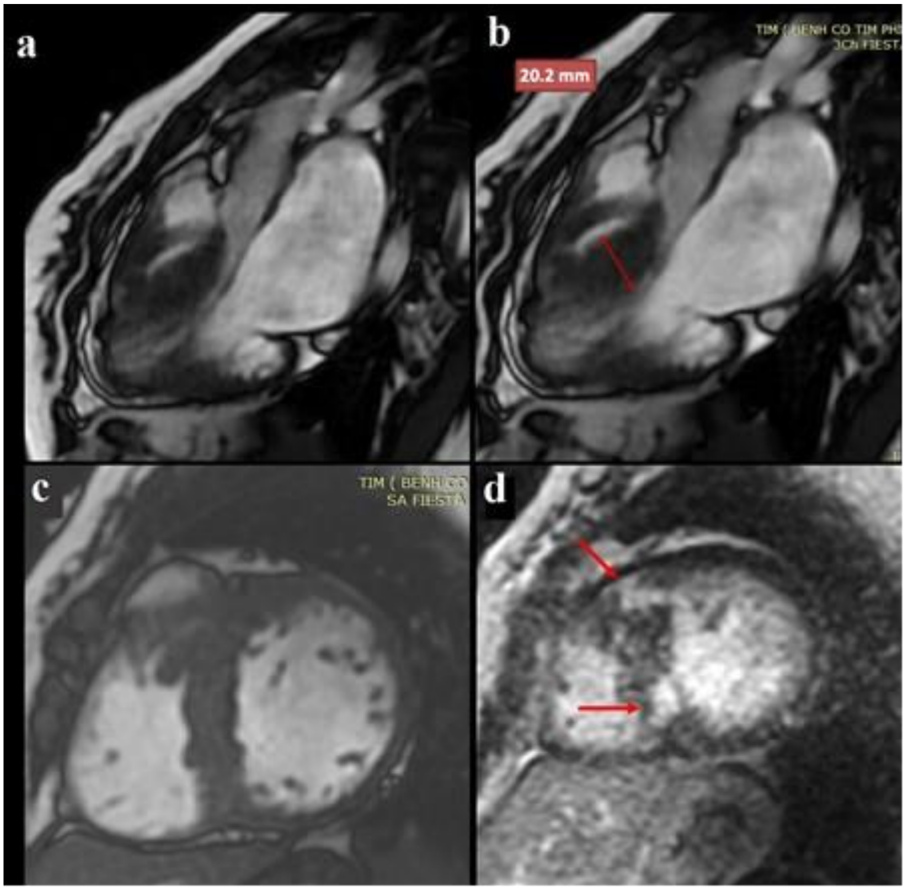

Fig. 3. CMR images of the proband. a, b The three-chamber cine view showed inter-ventricular septal hypertrophy and LOVT obstruction with maximal wall thickness being 19 mm. c The short-axis cine view at end-diastoclic epicted mid-basal anterior and mid-basal posterior hypertrophy. d Diffuse and patchy paterns of late gadolinium enhancement predominantly in mid-basal anterior and mid-basal posterior walls (red arrows).

Clinical data for family member. Three of the proband's family members were screened for HCM including her father (subject I.1), her mother (subject I.2), and her elder sister (subject II.1). All of them underwent ECG, echocardiography, and blood testing. Clinical examinations and testing of proband's mother and sister were normal; however, her father's ECG demonstrated a total right bundle branch block and his echocardiography was suspected to show mid-interventricular septal hypertrophy with the maximal wall thickness was 14.26 mm (Fig. 4). Then, he was re-evaluated using CMR which revealed mid-anterior and inferior lateral walls hypertrophy with the maximal wall thickness being 15 mm and diffuse and patchy pattern of LGE in those areas (Fig. 5). While the patient had merely mild dyspnea his heart rate was approximately 90 bpm at rest accompany with the blood pressure standing at 140/80. His 24-hour ambulatory ECG had nearly 2000 premature ventricular complex without any malignant arrythmias. Additionally, his coronary angiography was also normal.

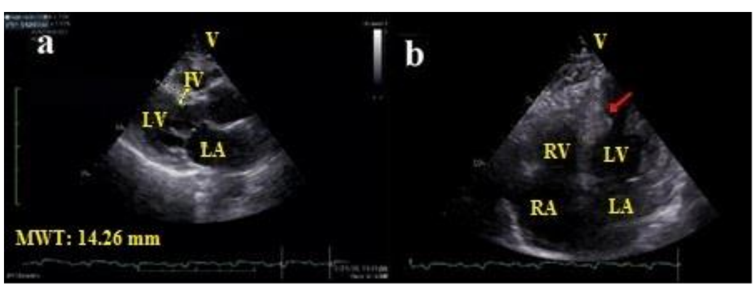

Fig. 4. Transthoracic echocardiogram of proband's father. a Parasternal long-axis view showed borderline hypertrophy and an increased echogenicity of basal interventricular septum with maximal wall thickness being 14.26 mm. b Apical 4-chamber view demonstrated mid-septal hypertrophy (red arrow).

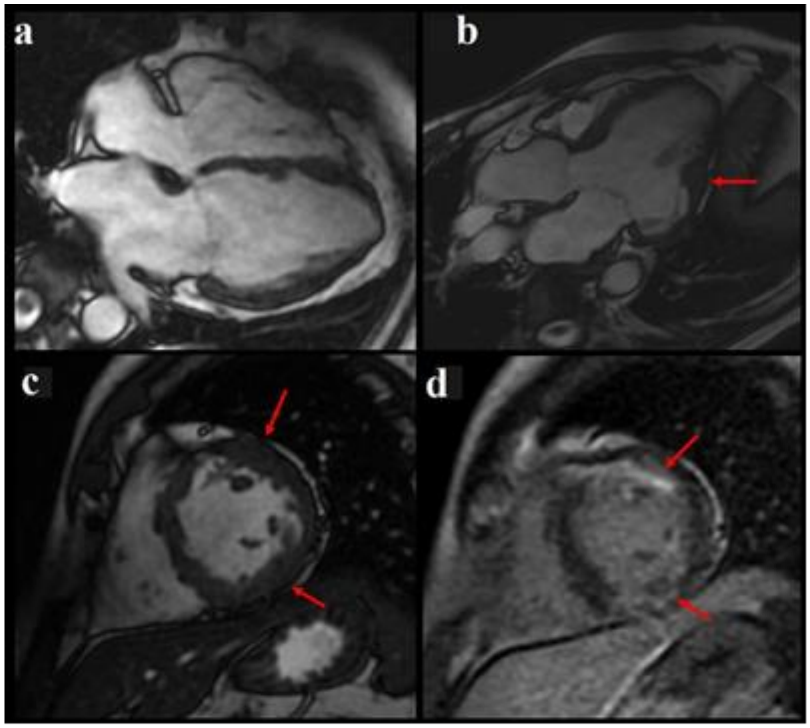

Fig. 5. CMR images of the proband's father. a, b, c Four-chamber, three chamber and short axis end-diastolic cine CMR image of patient with noncontiguous HCM showed mid anterior wall and inferior lateral wall hypertrophy (maximal wall thickness, 15mm). d Late gadolinium enhancement patterns show diffuse and patchy area of LGE in mid-anterior wall and inferior-lateral wall hypertrophy (red arrows).

Whole genome analysis. This study was conducted in a 4-member-family including the proband who was diagnosed with hypertrophic cardiomyopathy, her parents and her sister. Approximately 3.535.788 single-nucleotide variants (SNVs) and 718.282 insertions or deletions (InDels) were identified in the proband (III:1). 22 HCM susceptibility genes and 13 genes related to HCM phenocopies were analyzed (Table 2). The HCM susceptible gene group includes genes that encode thick, thin and intermediate filament proteins of the sarcomere, contiguous Z-disc. Except a mutation at position c.G2308A in the MYBPC3 gene, no mutation was identified in the remaining genes. The family's pedigree was shown in Fig. 6. The analysis revealed a heterozygous c.G2308A (p.Asp770Asn) in exon 22 of MYBPC3 gene appeared in proband and her father. Fig. 6a presented family tree of MYBPC3 c.G2308A variant in patient's family members including father and proband with heterozygous, the mother and her sister with wild-type homozygous. It meant that the mutation allele related to HCM proband received from her father as well-known dominant inheritance. The whole exome analysis was confirmed by Sanger sequencing (Fig. 6b). Here the results predicting the effect of this single amino acid substitution on protein function with the PROVEAN and CADD program are 34 and -3.92, respectively. All in silico-prediction methods suggested that the c.G2308A (p.Asp770Asn) is a non-functional variant.

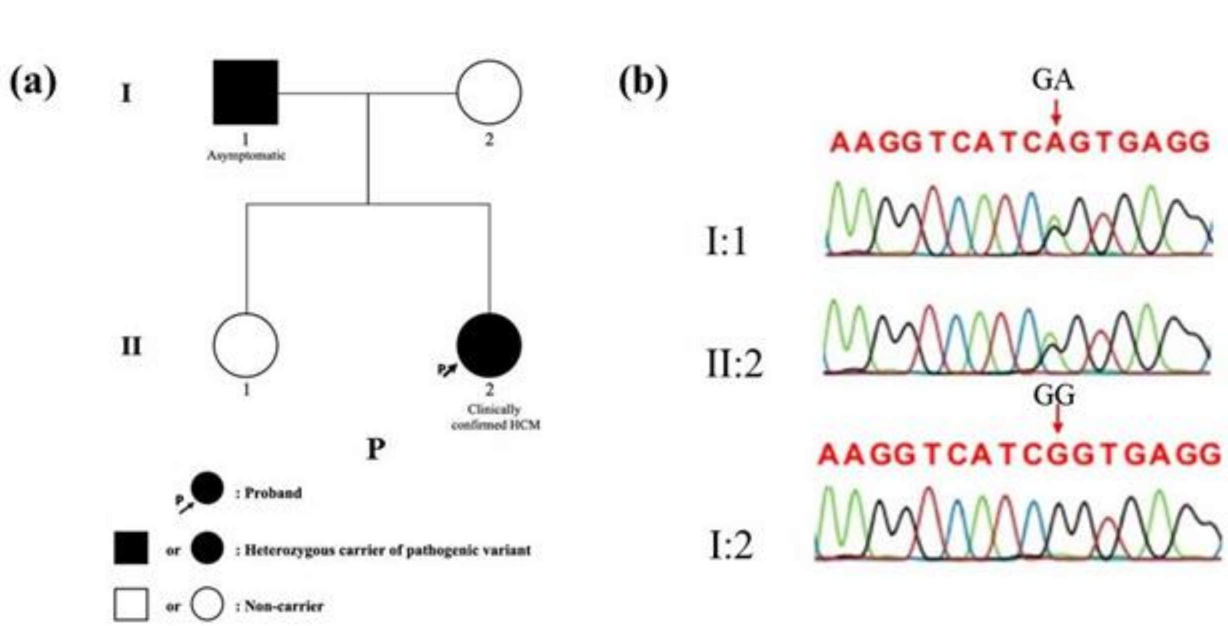

Fig. 6. Family tree and validation of the possibly pathogenic variants. a Family tree and MYBPC3 genotype–phenotype relationship. b Sanger sequencing confirmation of the MYBPC3 c.G2308A. The arrow indicates the site of variant identified in the proband (**II**:2) and the father (**I**:1).

Table 2. Hypertrophic cardiomyopathy susceptibility and phenocopies genes in this study

	Gene	Locus	Protein
Thick filament			
1.	*MYH7*	14q11.2–q12	Beta-myosin heavy chain
2.	*MYL2*	12q23–q24.3	Ventricular regulatory myosin light chain
3.	*MYL3*	3p21.2–p21.3	Ventricular essential myosin light chain
4.	*MYH6*	14q11.2–q12	Alpha-myosin heavy chain
5.	*TTN*	2q24.3	Titin
Thin filament			
6.	*ACTC*	15q14	Alpha-cardiac actin
7.	*TNNC1*	3p21.3–p14.3	Cardiac troponin C
8.	*TNNI3*	19p13.4	Cardiac troponin I
9.	*TNNT2*	1q32	Cardiac troponin T
10.	*TPM1*	15q22.1	Alpha-tropomyosin
Intermediate filament			
11.	*MYBPC3**	11p11.2	Cardiac myosin binding protein C
12.	*LMNA*	1q22	Lamins
Z-disc			
13.	*ACTN2*	1q42–q43	Alpha-actinin 2
14.	*CSRP3*	11p15.1	Muscle LIM protein

15.	*LBD3*	10q22.2–q23.3	LIM binding domain 3 (alias: ZASP)
16.	*MYOZ2*	4q26–q27	Myozenin 2
17.	*NEXN*	1p31.1	Filamentous actin-binding protein
18.	*TCAP*	17q12–q21.1	Telethonin
19.	*VCL*	10q22.1–q23	Vinculin/metavinculin
Calcium handling			
20.	*CASQ2*	1p13.1	Calsequestrin 2
21.	*JPH2*	20q12	Junctophilin-2
22.	*PLN*	6q22.1	Phospholamban
Hypertrophic cardiomyopathy phenocopies			
23.	*TAZ*	Xq28	Tafazzin (G4.5)
24.	*DTNA*	18q12	Alpha-dystrobrevin
25.	*PRKAG2*	7q35–q36.36	AMP-activated protein kinase
26.	*LAMP2*	Xq24	Lysosome-associated membrane protein 2
27.	*GAA*	17q25.2–q25.3	Alpha-1,4-glucosidase deficiency
28.	*GLA*	Xq22	Alpha-galactosidase A
29.	*AGL*	1p21	Amylo-1,6-glucosidase
30.	*FXN*	9q13	Frataxin
31.	*PTPN11*	12q24.1	Protein tyrosine phosphatase, nonreceptor type 11, SHP-2

HCM is well-known as complicated disease which affected by many factors including familial or non-familial origin such as sarcomeric protein mutations, glycogen storage, lysosomal storage, disorders of fatty acid metabolism or obesity, athletic training and diabetic risk. Using whole exome sequencing, other 40 genes related to other cardiovascular disease, cancer, recessive diseases, nutrition and metabolism, exercise and sports and metabolic disease were analyzed for all family members (Table 3).

Table 3. Some polymorphisms associated with other diseases

Diseases	***Genes were analyzed***	**SNP**	**Genotype**				**Phenotypic predictions**
			I:1	**I:2**	**II:1**	**II:2**	
Cardiovascular diseases							
Catecholamine induced ventricular tachycardia	*RYR2*	None	-	-	-	-	Normal
Arrhythmogenic right ventricular cardiomyopathy	*PKP2; DSP; DSC2; DSG2; TMEM43*	None	-	-	-	-	Normal
Long QT syndrome/ Brugada syndrome	*KCNQ1; KCNH2; SCN5A*	None	-	-	-	-	Normal
Familial hypercholesterolemia	*LDLR; APOB; PCSK9*	None	-	-	-	-	Normal

Cancer							
Breast cancer	*BRCA1; BRCA2; TP53;PTEN; STK11; CDH1*	None	-	-	-	-	Normal
Ovarian cancer	*BRCA1; BRCA2; MLH1; MSH2; STK11*	None	-	-	-	-	Normal
Endometrial cancer	*MLH1; MLH2; MSH6; PMS2; PTEN; STK11*	None	-	-	-	-	Normal
Colorectal cancer	*MLH1; MSH2; MSH6; PMS2; APC; MUTYH; STK11; BMPR1A; SMAD4*	None	-	-	-	-	Normal
Thyroid cancer	*PTEN*	None	-	-	-	-	Normal
Stomach cancer	*MLH1; MSH2; STK11; BMPR1A; SMAD4*	None	-	-	-	-	Normal
Pancreatic cancer	*STK11; BRCA2*	None	-	-	-	-	Normal
Recessive diseases							
Beta thalassemias	*HBB*	None	-	-	-	-	Normal
Cystic fibrosis	*CFTR*	None	-	-	-	-	Normal
Congenital adrenal hyperplasia	*CYP21A2*	None	-	-	-	-	Normal
Wilson disease	*ATP7B*	None	-	-	-	-	Normal
Citrin deficiency	*SLC25A13*	None	-	-	-	-	Normal
Nutrition and metabolism							
Vitamin B2 and folic acid levels	*MTHFR*	rs1801133	C/T	C/T	C/C	T/T	T/T: deficiency risk
Plasma vitamin C levels	*SLC23A1*	None	-	-	-	-	Normal
Vitamin D serum concentrations	*GC*	None	-	-	-	-	Normal
Cafeine metabolism	*CYP1A2*	rs762551	C/A	A/A	C/A	A/A	C/A: slow metabolism
Exercise and sports							
Sport performance	*ACTN3*	rs1815739	T/T	C/T	T/T	C/T	C/T: consistent with power and sprinter sport; T/T: Consistent with endurance sport
Recovery Efficiency	*CRP*	rs1130864	G/G	G/A	G/A	G/A	Normal
Metabolic disease							
Osteoarthritis	*GDF5*	rs143383	A/A	A/A	A/A	A/A	High risk
Type 2 diabetes	*TCF7L2*	None	-	-	-	-	Normal
Drug response							
Peginterferon alfa-2a / 2b	*IFNL3*	rs12979860	C/T	C/C	C/T	C/T	C/T: Unfavorable response
SNP: single nucleotide polymorphism, *BMPR1A:* bone morphogenetic protein receptor type 1A coding gene, *SMAD4 :* SMAD family member 4 coding gene, *ACTN3:* actinin alpha 3 coding gene, WNT: signaling pathway regulator coding gene, *APOB:* apolipoprotein B coding gene, *ATP7B:* copper-transporting ATPase 2 coding gene, *BRCA1:* DNA repair associated BRCA1 protein coding gene, *BRCA2:* DNA repair associated BRCA2 protein coding gene, *CDH1 :* cadherin 1 coding gene, *CFTR:* cystic fibrosis transmembrane conductance regulator coding gene, *CRP:* C-reactive protein coding gene, *CYP1A2:* P450 enzyme involved in O-deethylation of phenacetin coding gene, *CYP21A2:* 21-hydroxylase coding gene, *DSC2:* desmocollin-2 coding gene coding gene, *DSG2:* desmoglein 2 coding gene, *DSP:* desmoplakin coding gene, *GC:* GC Vitamin D Binding Protein coding gene, *GDF5:* growth							

differentiation factor 5 coding gene, *HBB:* hemoglobin subunit beta coding gene, *IFNL3:* interferon lambda 3 coding gene, *KCNH2:* potassium voltage-gated channel subfamily H member 2 coding gene, *KCNQ1:* potassium voltage-gated channel subfamily Q member 1 coding gene, *LDLR:* low density lipoprotein receptor coding gene, *MLH1 (or PMS2):* mutL homolog 1 coding gene, *MLH2:* DNA mismatch repair protein MLH2 coding gene, *MSH2:* mutS homolog 2 coding gene, *MSH6:* mutS homolog 6 coding gene, *MTHFR:* methylenetetrahydrofolate reductase coding gene, *MUTYH:* mutY DNA glycosylase coding gene, *PCSK9:* proprotein convertase subtilisin/kexin type 9 coding gene, *PKP2:* plakophilin 2 coding gene, *PMS2:* PMS1 homolog 2, mismatch repair system component coding gene, *PTEN:* phosphatase and tensin homolog coding gene, *RYR2:* ryanodine receptor 2 coding gene, *SCN5A:* sodium voltage-gated channel alpha subunit 5 coding gene, *SLC23A1:* vitamin C transporters coding gene, *SLC25A13:* citrin coding gene, *STK11:* serine/threonine kinase 11 coding gene, *TCF7L2:* transcription factor 7 like 2 coding gene, *TMEM43:* transmembrane protein 43 coding gene, *TP53:* tumor protein p53 coding gene.

Table 3 shown that all family members do not have genetic risk factors that relate to cardiovascular, cancer and recessive diseases. However, some mutant alleles affecting nutrition and metabolism, metabolic disease, exercise and sports training and drug response were found. Genetic variations affect nutrition and metabolism were found including rs1801133 (MTHFR gene) and rs762551 (CYP1A2 gene). Genetic variations affect exercise and sports ability were rs1815739 (ACTN3 gene) and rs1130864 (CRP gene). Notably, proband and her mother both have the heterozygous genotype in rs1815739, which are associated with skeletal muscle mobility differently from her father and her sister. This whole family is at high risk of osteoarthritis with the mutated homozygous genotype at rs143383 (GDF5 gene). Comparing genotypic data of four members, proband is the carrier of the most detrimental gene mutations. The proband has a mutated homozygous genotype at rs1801133 (MTHFR gene) that could lead to a risk of vitamin B2 and folic acid deficiency. With the exception of proband's mother, the remaining members have the heterozygous genotype at rs12979860 (IFNL3 gene), which causes poor response to the interferon alfa drugs.

Discussion

In this study, a 4-member-family (including the proband, her parents and her elder sister) was screened for HCM. There are only 2 out of them (the proband and her father) were clinically confirmed HCM. Although the proband experienced the first symptom at the age of 10 and both of her echocardiography and CMR features were typical for HCM, the proband’s father had merely mild dyspnea on exertion along with borderline characteristics of HCM on echo as well as CMR. Many studies indicated that HCM is one of the most heterogeneous cardiovascular disease, which is diverse in clinical presentation, natural history and phenotypic expression [21]. A meta-analysis on 7675 subjects from 39 studies showed that mutations in MYH7 gene associated with earlier onset and more severe symptoms compared to mutations in other genes [22]. Yasunobu Terauchi et al. investigated in 61 subjects with MYBPC3 mutations showing that female subjects are at later onset of the disease but being more symptomatic and having more heart failure events [23]. In our research, the female proband was at earlier onset and having more severe symptoms, ranging from dyspnea, chest discomfort and palpitation compared to only mild dyspnea on exertion of the father. The mechanism of phenotypic expression is still unclear, it is more likely a multifactorial disease than a monogenic disease, ranging from genetic combination, infection, exposure to toxin [24].

HCM is inherited in an autosomal dominant pattern and MYBPC3 predominate in eight sarcomere genes causing HCM [25]. In Vietnamese HCM patients, mutations in MYBPC3 recorded for 38.6%, has the highest frequency in HCM mutations [26]. In our study, the proband family was performed WGS, proband and proband' father all have the MYBPC3 heterozygous genotype (c.G2308A, p.Asp770Asn). This pathogenic variant is conserved RNA splice site mutation that leads to the loss of the splice donor position in the protein and skips exon 23, resulting in a truncated protein [27]. The truncated MYBPC3 protein could be proved by shortening of mRNA shown by Helms AS et al. (2014). That could lead to lower total MYBPC3 protein levels, reduces the heart's ability to pump blood [28]. Interestingly, HCM expression level at the proband and the proband' father were not the same although they had the same genotype for the 35 genes that cause HCM. The hypertrophic signs of proband's father is not clear on echocardiography and the sequencing results is an indication of the potential cardiovascular risk in this patient. The allele frequency of the variant c.G2308A (p.Asp770Asn) is zero in all three databases, i.e., the Vietnamese genome database, the 1000 Human Genome Project Database, or the gnomAD database. Thus, c.G2308A is a really rare variant not only in Vietnamese population but also in other populations. From this report, we provide additional clinical evidence to recommend MYBPC3 gene testing with HCM patients' family.

Unlike the father, the proband carries a mutant allele at c.C1729T or rs1815739 (p.Arg577Ter) in the ACTN3 gene. Previous studies have shown that this gene encodes an α-actinin-3 protein and this mutant allele leads to reduce fast-twitch muscle fiber diameter, muscle mass and strength [29]. Bernardez-Pereira et al suggested rs1815739 polymorphism modulates survival and could be used as a predictive marker in heart failure in the future [30]. The presence of this mutant allele may be one of the causes of proband's hypertrophic cardiac having stronger manifestations than the father.

The main advantage of WGS is the ability to extract information of any gene. Genetic data not only supports HCM diagnosis better, but it is also the basis for early diagnosis of many other diseases that have increasing incidences such as cancer or osteoarthritis. In addition to the pathogenic genes, genes related to metabolism, drug response, and athletic ability were also provided in this study. This is the basis of personalized medicine that is the trend for the future of healthcare. This genetic information gives us a better comprehensive view of the individual characteristics of the patient, thereby providing the optimal healthcare.

Conclusion and Recommendations

Electrocardiography, echocardiography and cardiac magnetic resonance for a 4-member-family showed that the younger daughter (proband) has obvious symptoms of HCM after 10 years of age while her father has atypical HCM. WGS results with 35 genes related to HCM showed that these two people both have a mutant at position c.G2308A (p.Asp770Asn) in the MYBPC3 gene. In addition, proband also carries a mutation c.C1729T in the ACTN3 gene that might affect the development of HCM in this patient.

Acknowledgement

We thank the proband family for allowing us to publish this result. This study was supported by a grant from the Vietnam National University Hanoi (Grant Number QG.18.60).

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Morphological Characteristics of Abaca (Musa Textilis Nee') Cultivars Grown in Two Municipalities of Aklan, Philippines

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Abstract - The present study identified the different abaca (Musa textilis Nee) cultivars grown in the 34 identified abaca producing barangays of Madalag and Libacao, Aklan, Philippines, and evaluated the morphological characteristics of the matured abaca plant such as plant height, number of suckers, number of leaves, the circumference of pseudostem and length of stalks. Stratified random sampling was conducted, from the two municipalities there were 34 abaca-producing barangays identified, and three abaca plantations were randomly selected to obtain the morphological characteristics of the different abaca cultivars using the prescribed measurement procedures. Distribution of the cultivars determined through geospatial mapping using Geographic Information System (GIS). Statistical analyses employed were single factor analysis of variance (ANOVA) and T-test to determine significant differences among groups/cultivars at α = 0.05 level of significance. The findings showed that there were four identified abaca cultivars commonly grown in Madalag and Libacao. These were Bisaya, Tabukanon, Agbayanon and Negro cultivars. Moreover, the morphological performance of the different cultivars responded differently. The study will provide relevant data on the distribution and morphological characteristics of abaca cultivars in the province. It could enhance programs and interventions in achieving the local and global demand for high-quality abaca fiber.

Keywords - Distribution, Fiber, Geographic Information System, Musae, Variety

Introduction

The province of Aklan produced 82% of abaca in Western Visayas, Philippines in 2016, and the province also produces good quality fiber. In the country, the province of Aklan ranked 9th among the top 10 abaca fiber-producing provinces in 2016, producing 2,400 metric tons (Philippine Information Agency-12, 2017).The Akeanon-Bukidnon indigenous peoples of Aklan have long relied on the harvest and trade of abaca fibers from the abaca plant as a major source of income (Santiago, 2021). However, some of these farmers don't recognize the cultivars they commonly used as planting material and relying solely on the physical attributes in varietal selection. Hence, there were no existing literature, techno guide, botanical descriptors and morphological characteristics of the abaca varieties used in the province of Aklan. Morphological characteristics is extremely important in the literacy world. Plant variety and cultivar identification is one of the most important aspects in agricultural systems. There were limited information on the morphological characteristics of the abaca varieties being used in the province of Aklan.

In the Philippines; several abaca varieties, their relatives and many hybrids exist. Carlos (1978) reported no less than 200 abaca varieties throughout the archipelago. Several researches (Robinson and Johnson, 1953; Gorres and, 1955; Pasco, 1957; Bernado 1957; Brewbaker and Umali, 1956 and Palatino, 1972) have shown that Musa cultivars vary in their gross morphological characteristics. There are more than 700 accessions of abaca being maintained in ex situ genebanks in the country (Altoveros and Borromeo 2007) excluding abaca in the wild (Villavicensio et al, 2007). Moreover, abaca is highly location specific; i.e. a variety may be suitable in one location but not in another. Since the early years of cultivation, there are select outstanding varieties distinct in Luzon, Visayas and Mindanao. These varieties have shown adaptability and stability in their respective location, thus grown and stripped for the prized fiber. Despite the long history of abaca cultivation in the Philippines, no attempt has been made to register the varieties that have long been recommended (PhilFIDA,2016). Based from the PhilFIDA Aklan, the abaca varieties in the province are not yet registered with National Seed Industry Council (NSIC).

Studies on this aspect may be significant in the varietal screening, classification, and fiber yield. Further, the plant character in terms of its plant height, number of suckers, number of leaves, the circumference of pseudostem, length of stalks, and distribution of the different abaca cultivars produced in the Province of Aklan is not yet fully understood and explored. This study aimed to identify abaca cultivars, determine the geographical distribution, describe the morphological characteristics and significant differences among abaca cultivars in terms of plant height, number of suckers, number of leaves, the circumference of pseudostem, and length of stalks in the top 2 abaca-producing municipalities in the province of Aklan. The study will provide relevant data and information to the concerned Government Agencies and researchers on the geographical distribution and morphological characteristics of abaca cultivars in the province. It could enhance programs and interventions of these GAs for the benefit of farmers, producers, and stakeholders in achieving and meeting the local and global demand for high-quality abaca fiber.

Methodology

Preliminary Survey. The preliminary information regarding abaca production was obtained from various agencies such as the Department of Agriculture, Philippine Fiber Industry Development Authority, Office of the Provincial Agriculture (OPA), and Local Government Units (LGUs). Information on the area planted per municipality, the number of farmers that are actively involved in abaca farming, cultivars planted, and the among others were secured from these agencies cited.

Respondents of the Study. The respondents in the study are abaca farmers reflected in the official list of the PhilFIDA and the concerned barangays. To be included in the list, they must have an existing abaca plantation of at least a quarter of a hectare. Ten (10) abaca farmers were randomly selected and identified by the researcher and assisted by the representatives from the Barangay Council of each barangay surveyed.

Study Sites Identification and Validation. Table 1 shows the full list of the abaca-producing barangays in the municipalities of Madalag and Libacao, Aklan, Philippines.

Table 1. Full list of the abaca-producing barangays in the municipalities of Madalag and Libacao, Aklan, Philippines.

Municipality of Madalag	Municipality of Libacao
Alas as	Manika
San Jose	Janlud
Dit-Ana	Guadalupe
Talangban	Calamcan
Panipiason	Bonza
Medina	Oyang
Paningayan	Rosal
Napnot	Sibalew
Pang-itan	Ogsip
Mercedes	Ortega
Mamba	Casit-an
Ma. Cristina	Pinonoy
Galicia	Loctuga
	Agamilig
	Alfonso XII
	Bato bato
	Julita
	Pampango
	Can-awan
	Dalagsaan
	Rivera

Source: PhilFIDA Aklan, 2017

Data Gathering

Survey questionnaire. Pre-tested validated and approved questionnaires were administered to the abaca farmers. Respondents were required to answer all of the questions based on their existing knowledge and experience. The researcher assisted the respondents, and all respondents affixed their signature or thumb mark after they have answered the questionnaires.

Field survey and data collection. The data on morphological characteristics were obtained from the fifteen randomly selected matured abaca plants per abaca plantation showing its flag leaf or a total of 45 sample plants per cultivar in three sampling sites of the 34 barangays.

Morphological Characteristic. Morphological characteristics of abaca cultivars were evaluated through validation and comparison of botanical descriptors of abaca. Data on the different abaca cultivars regarding their height, number of suckers, number of leaves, the pseudostem circumference, and length of the stalk were collected on-site using the prescribed measurement procedures. Forty-Five (45) matured abaca cultivar that exists in the barangay showing its flag leaf was subjected for analysis to obtain the morphological characteristics of abaca per cultivar to differentiate the growth performance, in terms of:

1. Height of the plant (cm). Plant height was measured in cm from the base up to the highest leaf of the plant with the use of a meter roll.
2. Number of suckers. The number of suckers of the abaca plant emerging from the mother corm and soil surface at any size was determined through ocular observation and manual counting.
3. Number of functional leaves/leaf sheath. The functional leaves existing on the abaca plant were determined by counting the fully developed leaves.
4. Circumference of the pseudostem (cm). The circumference of the pseudostem was measured in cm one foot from the base of the plant using a tape measure.
5. Length of the stalk (cm). The length of the stalk was measured in cm with the use of a meter roll from the base of the abaca plant up to the first petiole — each stalk ranges from 12 to 20 feet in height.

Abaca cultivars and local name identification. The identification of abaca cultivars planted by the farmers was determined through its general appearance and characteristics such as plant height, pseudostem, and size of its fruits. Likewise, further evaluation through validation and comparison of the identified cultivar using reliable references such as abaca descriptors provided by the PhilFIDA. A key informant interview with the abaca farmers regarding the different cultivar planted and used was also conducted by the researcher for easy identification and further reference.

Data Management, Processing and Analysis. The identified abaca cultivars were recorded and tabulated for analysis. Geo-tagged photos were copied into GIS format to produce a map showing the exact location. Other references such as books, journals, and other similar information sources, were used in the abaca cultivar identification. Processing the geographic location of abaca cultivars was determined using the following procedures and applications:

Geomapping and lay-outing. An assessment of a geotagged photo was conducted through image quality control. Geotagged photos of cultivars were used in determining the geographic location. The geotagged photos taken were embedded with a date stamp, location coordinate, and altitude which can easily be uploaded to Google Earth in determining its exact geographic location. The geotagged photos were uploaded to Google Earth Software through the use of a Picasa photo viewer. The ARC GIS was used after the parameters were gathered and uploaded to Google Earth. Further, it was processed to the ARC GIS software, which came up with a layout of the geographic locations of each cultivar with corresponding legends and location map.

Data analysis. The data gathered were encoded and analyzed using qualitative and quantitative statistics. From the completed survey questionnaire, the data were encoded/tabulated and analyzed using

Microsoft Excel. Descriptive statistical tools such as percentage, mean, and rank were employed in analyzing the data. The morphological characteristics of abaca varieties for each municipality were analyzed using single factor Analysis of Variance (ANOVA) to determine significant differences among groups/cultivars. Significant results were further analyzed using the Bonferroni Correction Test to determine significant differences between groups at a 95 % confidence level (alpha = 0.05).

Results and Discussions

The Commonly-Grown Abaca Cultivars in the Two Municipalities. Figure 1 shows, the four abaca cultivars were being planted by the farmers, three of which are commonly planted by both farmers of Madalag and Libacao. These are the , Tabukanon, Bisaya, and Agbayanon. Only farmers of Libacao planted the Negro cultivar. These cultivars are commonly planted in these areas because it is relatively easy to propagate and readily available in the area. These cultivars were also known to be indigenous in the Province of Aklan. It was shown in Figure 2, that among all the cultivars, Bisaya is the most frequently used planting material by the farmers in Madalag and Libacao having 92.30% and 95.24% respectively of the identified abaca producing barangays. The farmers preferred to use the Bisaya cultivar for abaca production primarily because it has good yield attributes due to its suckering ability as it affirmed in the morphological performance of the study, thus, higher economic returns to the farmers. Likewise, it is more convenient to harvest the Bisaya cultivar because of its height and lightweight features that are easy to haul from the plantation site up to the access road.

Figure 1. Four abaca cultivars identified and grown by the abaca farmers in the municipalities of Madalag and Libacao, Philippines

Moreover, the least cultivar grown by the abaca farmers is the Agbayanon cultivar in Madalag with 46.13% and Negro cultivar in Libacao with only 23.81% Notably, this Negro cultivar is only grown in Libacao and showed ideal morphological performance among all the cultivars identified. However, it only produces 1 to 2 suckers, which is one of the primary considerations of the farmers for production. In addition, it requires more space because of the wider planting distance due to its height and a larger canopy. Figures 3 and 4 presented the geographical distribution of the different abaca cultivars planted in the Municipality of Madalag and Libacao, Aklan.

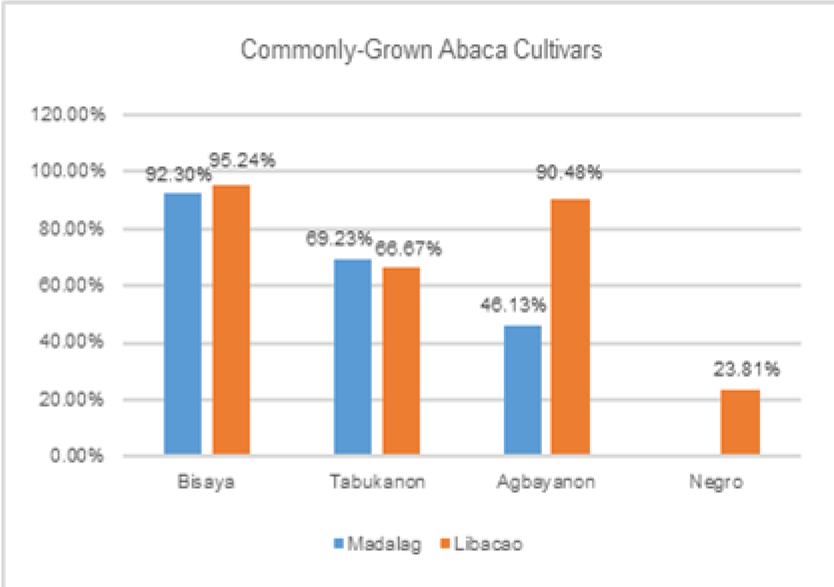

Figure 2. Commonly-grown abaca cultivars in the municipalities of Madalag and Libacao, Philippines

Musae is vegetatively propagated from suckers developing from the main plant. Sucker development consists of three distinct stages: peer (small sucker appearing just above the ground and bearing scale leaves only), sword sucker (large sucker with lanceolate type leaves), and maiden suckers (large sucker with foliage leaves) (Swennen and Ortiz, 1997). According to Vezina (2020), a sucker is a lateral shoot that develops from the rhizome and usually emerges close to the parent plant. Farmers traditionally depend on this natural regeneration process to replace their mother plants. Suckers can also be extracted from the mat for transplanting, sharing with farmers, or selling, a practice that contributes to the spread of pests and diseases. Cultivars with good suckering ability produce higher fiber yields that can be extracted from their stalk. Hence, dried fibers could also weigh much heavier. In this case, the farmers will gain more profit because the trade of abaca fiber in the market is on a per weight basis.

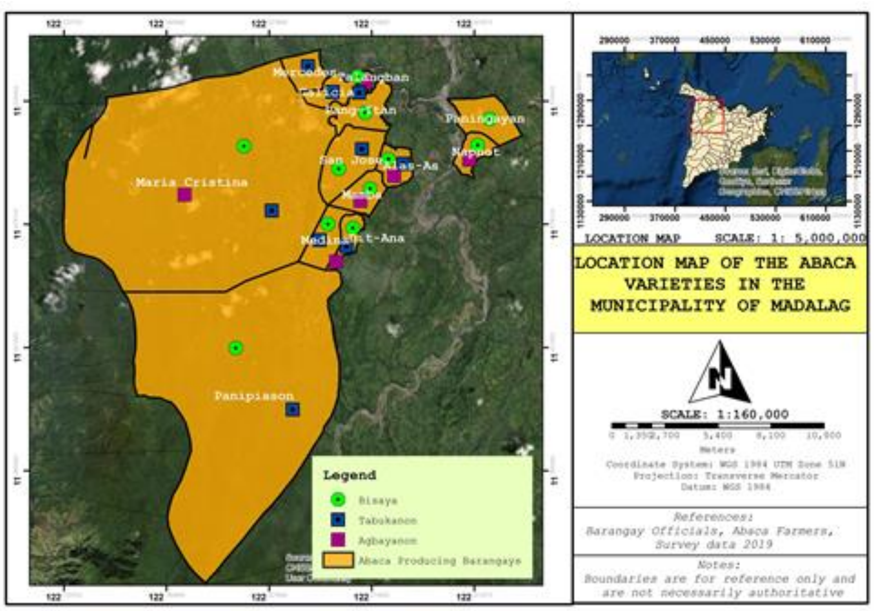

Figure 3. Location map of the abaca cultivars grown by the farmers in the Municipality of Madalag, Aklan, Philippines.

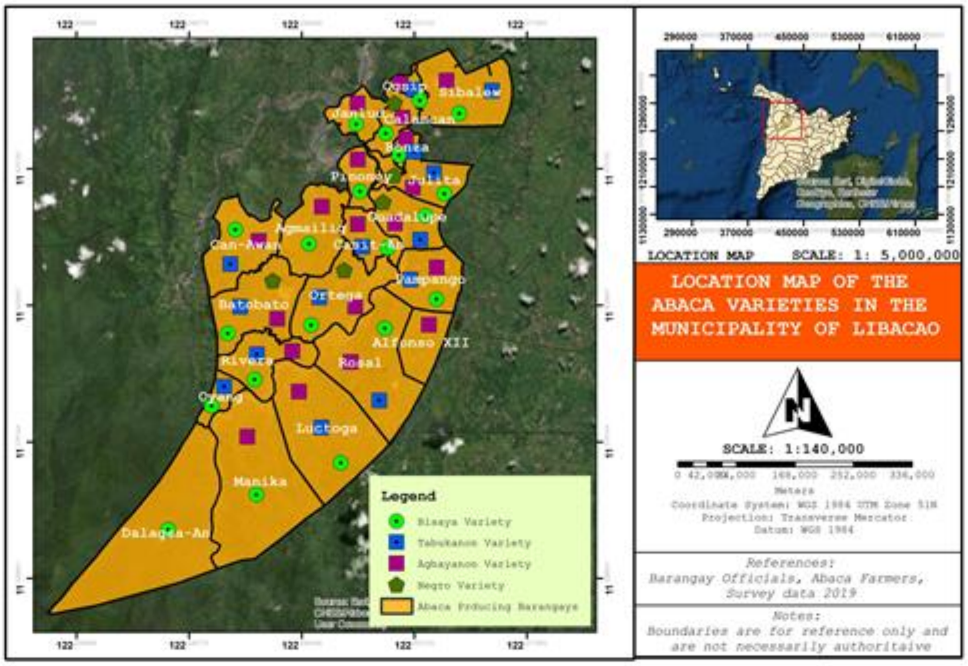

Figure 4. Location map of the abaca cultivars grown by the farmers in the Municipality of Libacao, Aklan, Philippines.

Morphological Characteristics of the Different Abaca Cultivar Grown in the Municipalities of Madalag and Libacao, Aklan, Philippines. As reflected in Table 1, the growth performance of the various cultivars responded differently in Madalag and Libacao. The majority of the morphological characteristics of the Bisaya and Tabukanon cultivars show no significant differences. The study implied that the growth performance of the different abaca cultivars in the two municipalities is location-specific. The performance of the abaca cultivar depends on where it is located and planted based on the locations, pedological characteristics, elevations, topography, and vegetative cover. Based on the results, it may be noted that each cultivar identified in the municipalities of Madalag and Libacao shows different morphological characteristics than the other cultivars being used by the farmers in other abaca-producing provinces. Moreover, the morphological performance of the different cultivars responded differently.

Table 1. Morphological characteristics of different abaca cultivar planted in the municipalities of Madalag and Libacao, Aklan, Philippines.

Morphological Characteristics	CULTIVAR			
	Bisaya	Tabukanon	Agbayanon	Negro
Municipality of Madalag				
Plant Height(cm)	408.75^{a}	364.67^{b}	417.67^{a}	
Number of Suckers	5.58^{a}	5.33^{a}	4.33^{a}	
Number of Leaves	7.58^{a}	7.00^{a}	7.00^{a}	
Circumference of Pseudo stem (cm)	34.28^{b}	31.00^{b}	44.28^{a}	
Length of Stalk (cm)	299.20^{a}	264.70^{a}	345.67^{a}	
Municipality of Libacao				
Plant Height(cm)	397.93^{c}	325.36^{b}	492.36^{a}	556.60^{a}
Number of Suckers	4.89^{ab}	6.20^{a}	4.26^{b}	1.40^{c}
Number of Leaves	7.80^{a}	7.71^{a}	8.05^{a}	9.20^{a}
Circumference of Pseudo stem (cm)	35.02^{b}	24.96^{c}	40.97^{a}	45.00^{a}
Length of Stalk (cm)	267.35^{c}	256.15^{c}	399.47^{b}	469.20^{a}

Note: Different superscript letter indicate statistical significance (Hans-Peter Piepho).

According to the study conducted by the PhilFIDA in 2000, on the adaptability of selected abaca varieties under different agroclimatic conditions in the Philippines, the interaction effect of the location of the abaca varieties on fiber yield was significant. Similarly, abaca varieties responded differently to the location specifically in Bicol, Leyte, and Maguindanao.

Plant Height. The data indicated that the plant height of Bisaya (408.75 cm) and Agbayanon (417.67 cm) in the municipality of Madalag was not significantly different from each other. However, Tabukanon (364.67 cm) is significantly shorter than the two abaca cultivars. Further, the data revealed that the Negro (556.60 cm) and Agbayanon (492.86 cm) cultivar in Libacao has no significant difference in terms of height. On the contrary, these two cultivars have significant differences from other cultivars such as Bisaya and Tabukanon. Moreover, the data revealed that the Negro cultivar is best in terms of plant height among all the cultivars grown. While the shortest was observed in the Tabukanon cultivar.

Based on its botanical descriptor, the abaca plant grows to 13-22 feet (4.0-6.7m) an average of about 12 feet (3.7m) (Wong et. al. 2002). The Inosa variety used in Eastern Visayas is much similar to Bisaya and Tabukanon in terms of plant height (3.0 - 4.0 m tall), additionally, it has upright leaves with tips tending to curl upward same with Bisaya and Tabukanon. The Agbayanon in Madalag has grown about a mean height of 4.17 m whereas Negro in Libacao grows about 5.5 meters tall. In some variety particularly in Mindanao, the Tangonon variety is much similar to the plant height of the Negro and Agbayanon cultivar ranging from 4.5 - 5.5 m tall (Gonzal and Valida, 2016). The data seem to indicate that Agbayanon and Negro cultivar are thriving best having the highest mean in terms of height in the municipalities of Madalag and Libacao.

Abaca requires a warm and humid climate for optimum growth and productivity. Based on the abaca sustainability manual of the PhilFIDA in 2016, the abaca requires about 40 - 50% shade and the municipalities of Madalag and Libacao have huge vegetative cover such as open and closed forest (Landcover, 2015). In addition, the majority of the abaca plantations were planted under leguminous trees such as rain trees and maganhop trees. These factors may have influenced the performance of abaca and other factors such as optimum light, nutrient, and water requirements of abaca. Leguminous trees are highly recommended because they do not only provide shade but also enrich the soil with nitrogen through a symbiotic relationship with soil bacteria (Bande et al., 2012). Other agricultural practices by the farmers may have also contributed a significant effect on the performance of the different abaca cultivars planted in these two municipalities.

Number of Suckers. As indicated in the figure, there was no significant difference in the number of suckers of the different cultivars grown in Madalag. However, the mean suckers per clump for Bisaya, Tabukanon and Agbayanon has a mean of 5.58, 5.33 and 4.33 respectively. Furthermore, the data showed that the Bisaya cultivar grown in Libacao was not significantly different compared to Agbayanon and Tabukanon. On the other hand, Agbayanon, Tabukanon, and Bisaya cultivars have a significant difference from the Negro cultivar. Moreover, the data also show that Tabukanon produces more suckers in Libacao having a mean of 6.20 suckers/clump. Whereas, the Negro was outnumbered, indicating poor performance in terms of suckering ability producing a mean of only 1.40 sucker/clump.

The number of suckers is one of the primary reasons why farmers in Madalag and Libacao are commonly using the Bisaya and Tabukanon cultivar as their planting materials for the production of abaca. The good suckering ability of these cultivars contributed to higher yields compared to other cultivars grown in the locality. Some farmers do not usually plant the Negro cultivar because it produces fewer suckers and requires more planting space because of its phenotypic characteristics in terms of height and canopy structure.

Notably,the Bisaya and Tabukanon cultivars are much similar to the Inosa variety which is a commercially grown variety in Eastern Visayas. Relatively, the Inosa is also resistant to drought and has a good suckering ability producing about 5 - 7 suckers/clumps (Gonzal and Valida, 2016) which is similar to Bisaya and Tabukanon cultivar that is commonly grown in Madalag and Libacao areas. Meanwhile, the Negro cultivar is much similar to the Tangongon variety which is commonly grown in Mindanao producing about 1 - 2 suckers/clumps (Gonzal and Valida, 2016) and quite similar with the abaca clones “Canton” and “Bulao Luno” which obtains the lowest number of suckers producing an average of 1.37 suckers per hill

(Alcober, 1986). In this case, the height of the abaca plant may have a significant effect on the number of suckers produced by the cultivar.

Furthermore, the Bisaya and Tabukanon are the considerable cultivars to the farmers of Madalag and Libacao as it gives good yielding attributes and has excellent suckering ability indicating the highest mean in the number of suckers. Likewise, the greater number of harvestable stalks produced by profusely suckering cultivars indicates a strong relationship between production of harvestable stalks and stooling ability of a variety. This observation suggests that stooling ability could be an important index in selecting a variety with high yielding potential. Accelerated production of suckers or followers per unit is important in replenishing harvested stalks and thus, a desirable character of abaca (Alcober, 1986).

Number of Leaves. The data revealed that there were no significant differences among all the cultivars grown in Madalag. However, data show that the Bisaya cultivar obtained a mean of 7.58 leaves/plant whereas Agbayanon and Tabukanon tied with exactly 7.00 leaves/plant. Similarly, the data also revealed that the number of leaves of the different abaca cultivars in Libacao has no significant difference from each other. However, number leaves/plant for Negro, Agbayon, Bisaya and Tubkanon has a mean of 9.20, 8.05, 7.80 and 7.71 respectively in Libacao.

The number of leaves indicates the total number of leaf sheaths within the stalk of the abaca plant where the abaca fibers are extracted from. Based on its botanical description, the abaca plant produces around 12 - 25 leaves (Britannica, 2014.) which is more than the number of leaves obtained in Madalag and Libacao. Primarily, these cultivars are native or indigenous to the province which basically can only be found in Aklan and associated with different growth factors such as climate, soil type, and cultural management practices. Hence, the data show that all the cultivar grown in Madalag and Libacao has no significant differences in terms of the number of leaves. According to Armecin in 2009, on the nutrient composition of abaca (Musa textilis Nee) at seedling, vegetative, and flag leaf stages of growth for the determination of macro and micronutrients present in the abaca through destructive sampling, he found out that the elements present in the leaves for the seedling, vegetative and flag leaf stage are the N, P, Ca, Mg and Mn. It may be assumed that these nutrients are maybe lacking or insufficient in Madalag and Libacao to support its growth performance in terms of the number of leaves.

Circumference of the Pseudostem. The data revealed that the Agbayanon has a significant difference in the circumference of the pseudostem when compared to Tabukanon and Bisaya. Whereas, there was no significant difference between the Bisaya and Tabukanon cultivar. Further, the data also revealed that there was no significant difference in the circumference of the pseudostem between Negro and Agbayanon cultivar in Libacao. However, these two cultivars have a significant difference between the Tabukanon and Bisaya cultivar.

Moreover, data show that the biggest mean circumference in Madalag was observed in the Agbayanon cultivar having a mean of 44.28 cm while the least was observed on Tabukanon cultivar having a mean of only 31.00 cm. The data also shows that the biggest mean circumference in Libacao was obtained from the Negro cultivar showing a mean of 45.00 cm. Whereas, the least data recorded was observed on the Tabukanon having a mean of only 24.96 cm. Further, data shows that the biggest mean circumference in Libacao was obtained from the Negro cultivar whereas, the least data recorded was observed on the Tabukanon in both municipalities.

According Vezina (2020), The pseudostem continues to grow in height as the leaves emerge one after the other and reaches its maximum height when the inflorescence emerges at the top of the plant. Therefore, the data indicate that plant height is one factor that have influenced the circumference of the pseudostem of the abaca cultivars. Consequently, the taller the abaca plant, the larger in size of the circumference of the pseudostem as the data shown for Agbayanon and Negro.

Length of the Stalk. Data showed that the Agbayanon, Bisaya, and Tabukanon cultivar grown in Madalag shows no significant difference in terms of length of stalk. However, the data indicate that the mean length obtained from Agbayanon has a mean of 345.67 cm whereas Bisaya has 299.20 cm and Tabukanon has 264.70 cm in length. Further, the data also revealed for the cultivars in Libacao shows that between Bisaya and Tabukanon there was no significant difference observed in terms of the length of the stalk between the two cultivars. However, these two cultivars have a significant difference between the Agbayanon and Negro. Moreover, the highest mean length of the stalk was recorded in Negro cultivar having a mean of 469.20 cm in length whereas the shortest was still obtained with the Tabukanon showing a mean of 256.15 cm in length.

According to the study on productivity and profitability of abaca varieties/hybrids under mature tall coconuts in Davao city, Southern Mindanao, the Philippines by Secretaria et al. 2012. The Magino Hybrid, Maguindanao, and Bongtang variety show a significant effect in terms of the length of the stalk (4 meters in length), which is similar to the length of the stalk of Negro and Agbayanon with an average length of 4 meters. By analyzing the numerical figures, data for the length of the stalk has a similarity to the data for the height of the abaca cultivar. The taller the abaca cultivar the longer the abaca stalk. Further, the size of the stalks could determine by the number of sheaths. The bigger the stalk with more leaf sheath produces heavier stalks hence, more fibers can be extracted. Similarly, longer stalks generally have longer leaf sheaths from which tuxies can be extracted. Thus longer fibers can be recovered resulting in higher fiber yield (Alcober, 1986). Further, according to Armecin in 2009, the nutrient composition of the fiber of the stalks, the dominant elements present is iron and potassium, which may also be present on the soil of the Municipalities of Madalag and Libacao as required by Negro and Agbayanon.

Conclusion and Recommendations

The study revealed that four abaca cultivars are being planted by the farmers, three of which are commonly planted by both farmers in Madalag and Libacao. These are the Bisaya, Tabukanon, and Agbayanon. Some farmers of Libacao planted the Negro cultivar. Based on the data gathered, the Bisaya cultivar is the frequently and widely used cultivar by the farmers in both municipalities primarily because this cultivar has good yielding attributes such as suckering ability. The study also revealed that the morphological performance of the different cultivars responded differently in both municipalities. It was also found that the majority of the morphological characteristics of Bisaya and Tabukanon show a not significant difference between the two cultivars. The different abaca cultivars showed wide variation in all morphological characteristics evaluated. Results of the present study indicate that plant height, number of leaves, number of suckers, and length of the stalks must be considered in selecting cultivars for high yield

Study on the correlation effect of the different cultivars planted in the two municipality under varying agroclimatic condition as well as morphological performance of the different cultivars associated with the pedological characteristics of the plantation areas in Madalag and Libacao, Aklan is recommend. Study in terms of its fiber performance and tensile strength of the four cultivars is recommended to determine the quality and yield performance to supply and achieving global demand of abaca fiber.

Acknowledgement

The authors are greatly acknowledged the PhilFIDA, DA, local officials, and barangay councils in the 34 barangays of the Municipalities of Libacao and Madalag, who extended their assistance and supervision during the conduct of the study.

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Macro Clonal Propagation of Cardava Banana using Different Potting Media

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Abstract - More than 95% of bananas are vegetatively propagated using sword suckers and water suckers. Although, tissue culture propagation of Cardava to generate a clean and numerous banana plantain is highly encouraged the mentioned choice is highly pricey. On the other hand, banana macro-clonal propagation is a technique that involves the use of a complete sucker. Compared to tissue-cultured bananas, this method of banana propagation is far less expensive, easier, and farmer-friendly. Thus, this study assessed the growth performance of Cardava (Dippig) using various farm waste compositions as potting media for macro clonal propagation. The experiment was laid out in a Completely Randomized Design (CRD) with five treatments and ten replications. The following are the treatments; T1 (control) Saw Dust Potting Media, T2-Soil and Chopped Banana Leaves and Trunk Potting Media, T3-Soil and Cow Manure Potting Media, T4-Soil and Mung Bean Pod Hull Potting Media, and T5-Soil and Rice Hull Potting Media. Gathered data were subjected to ANOVA and DMRT. The result shows that T4 - Soil and Mung Bean Pod Hull as potting media had the fastest and least minimum number of days (21.8 days) for Cardava shoot emergence. Additionally, it had the highest number of primary buds to emerge with 3.5 primary buds noted. Furthermore, it has the largest shoot stem diameter with a diameter of 9.9 cm and has the longest shoot stem length of 46.9 cm. Differences between corresponding control and treatments were statistically significant at $P < .05$. Based on the findings it is concluded that soil and mung bean pod hull as potting media is the best farm waste substrate mixture for macro clonal propagation of Cardava.

Keywords - Cardava, macro propagation, disease-free, substrate, plantain

Introduction

More than ninety-five percent (95%) of bananas and plantains are vegetatively propagated through sword sucker and other types of planting materials like water suckers, bits, etc. But the most common limiting factor for area expansion and enhanced productivity is the non-availability of clean, true to type and disease-free planting material. This situation is aggravated by the inherent poor suckering nature of some banana varieties. The problem may be addressed through tissue culture technology for the mass production of planting material. But tissue culture technology for bananas is still in infancy to fulfil the province total requirements. Hence, a simple, farmers-friendly method for mass multiplication through macro clonal propagation can be enhanced to bridge the gap in the supply of healthy planting material. This method generates plantlets from sword suckers as initial explants and farmers can adopt specially to enhance the planting material production and conservation of traditional cultivars right in their back yards.

Cardava bananas often spelled cardaba or kardaba, are a triploid hybrid (ABB) banana cultivar indigenous to the Philippines. Although it is generally used for cooking, it can also be consumed raw. It is frequently confused with the more widespread and closely related saba banana, owing to its similar use in traditional Filipino cooking. Although they are distinct cultivars, their common names are interchangeable in everyday usage (FS. Dela Cruz et al., 2008).

Cardava, similar to saba bananas, has enormous and robust pseudostems that reach a height of 4.5 meters (15 feet) and 68 centimeters (2.23 feet). It takes around 339 days to flower and 479 days to mature the fruits. Each bunch holds approximately 150 fruits and is held in nine hands. The fruits are noticeably larger than saba bananas and have a more rounded, pentagonal cross-section. They are typically picked unripe because they are used as cooking bananas, but they can be eaten whole if left to ripen (FS. Dela Cruz et al., 2008).

According to the Philippine Exporters Confederation, Inc. (PHILEXPORT) in Davao Region, limited commercial production of cardava prevents the Philippines from capitalizing on the variety's export potential. There is a need to develop seedling producers to encourage farmers to expand into commercial production on a large scale. According to banana stakeholders, nobody has paid attention to this sector for the last 40 years, particularly the cardava, saba, and lacatan. Perhaps this is why their production through the years has been more of a backyard affair. (2019, Padillo).

Many are unaware of the fact that the province of Abra has a competitive advantage in the cultivation of permanent crops. Based on the report of the PSA (2018), the province of Abra has three main crops with banana as the highest produce (26.6%), followed by squash (13.6%) and tobacco (10.9%). Additionally, the province of Abra yielded the highest production of bananas in the entire Cordillera Administrative Region with a total output of 38.4 percent. A decrease in banana production was experienced in recent years due to Fusarium wilt or Panama disease. The introduction of an enhanced banana propagation technology, farmer-friendly, and cost-effective will help in restoring the banana industry in the province.

Although, tissue culture propagation of Cardava to generate a clean and numerous banana plantain is highly encouraged. But the mentioned choice is highly pricey, notably to poor income farmers who plan to construct their own Cardava plantation. A dozen tissue-grown cardava plantain cost roughly Php. 1,100.00. Thus, its exorbitant price becomes unaffordable to farmers (Lunti.ph.,2020).

On the other hand, banana macro-clonal propagation is a technique that involves the use of a complete sucker. A substantial portion of the parent banana sword sucker can be used to generate planting materials (Faturoti et al., 2002). The technology can be applied in two ways: in situ (in the field) or ex-situ (in the nursery) (Singh et al., 2011). Apical dominance is typically suppressed by complete/partial decapitation or by the detached corm procedure to boost lateral bud growth and suckering rate. Compared to tissue-cultured bananas, this method of banana propagation is far less expensive, easier, and farmer-friendly.

Furthermore, this method generates plantlets from sword suckers as initial explants. Farmers can adapt significantly to enhance the planting material production and conservation of traditional cultivars right in their back yards. Hence, this study will evaluate the growth performance of macropropagated cardava bananas using various substrate formulations as potting media coming from farm waste materials available in the province of Abra, Philippines. Additionally, enhancing this propagation technology will bridge the gap in the supply of healthy planting material.

Methodology

Location of the Study. The experiment was conducted at the ASIST tissue culture laboratory and greenhouse located at the Research and Development Building, Poblacion, Lagangilang, Abra

Research Design. The experiment was laid out in a Completely Randomized Design (CRD) with five treatments and ten replications using different mixtures of farm waste materials as potting media. The saw dust acted as the control due to the reason that it is the most common potting media being utilized in banana macropropagation. After one month of growth, all parameters were gathered.

Treatment Details (1:1) ratio (Adapted from Conover et.al.1990)

T1 (Control)	Saw Dust Potting Media
T2	Soil and Chopped Banana leaves and Trunk Potting Media
T3	Soil and Cow Manure Potting Media
T4	Soil and Mung Bean Pod hull Potting Media
T5	Soil and Rice Hull Potting Media

Materials. Scalpel, sharp knives, bolo, shovel, disinfectants (alcohol, zonrox, fungicide), wheelbarrow, and knapsack sprayer/rose can.

Grow Bed Preparation. The grow bed in the ASIST Tissue Culture laboratory greenhouse was utilized. Different combinations or treatments of growing media were placed on individual grow beds for macro clonal propagation.

Preparation of the explant

1. Decortication – the field gathered cardava suckers are detopped immediately above the corm-aerial shoot junction, the pseudostem and roots are removed, and the external layer of the corm is scraped away with a sharp knife.

Figure 1. Decortication of Cardava Suckers

2. Decapitation – (i) Washing the decorticated corm in clean water mixed with 10 percent zonrox as a disinfectant. (ii) The apical meristem is excised to a depth of 2 cm, leaving a hollow spot in the rhizome measuring 2 cm in diameter. (iii) The remainder of the corm is cut six to eight times transversely and incised to a depth of 0.25 to 0.50 cm depending on the sucker size. (iv) Before sowing, the corms are washed with a 10 percent fungicide solution for 1-2 minutes and then air-dried in shade for 3–4 hours.

Figure 2. Decapitation of Cardava Suckers

3. Planting of decapitated corm and irrigation – (i) Decorticated and decapitated corms are planted in the substrate bed. (ii) The prepared substrate is watered sufficiently and excess water is allowed to drain. (iii) The corms are planted completely buried to a depth of 3 – 5cm followed by light irrigation with a rose can. (iv) Corms should not be exposed after irrigation. It should be covered with the prepared substrate

layer of 3 – 5 cm above the corm. (v) Irrigation frequency depends on the prevailing weather condition, type of substrate used. (vi) Care should be taken that there is no water stagnation.

Figure 3. Planting of decapitated banana corms

4. Bud formation – (i) Depending on the cultivar 2 – 5 primary bud emerge within 17 – 20 days depending upon the planting season. (ii) Bud are allowed to grow till they attain the 3 – 4 leaf stage. (iii) Now the buds are ready for secondary decapitation.

Figure 4. Bud formation of Cardava Suckers

5. Secondary decapitation –Still attached to the corm, the aerial portion of the plantlet is chopped off and 4 – 6 horizontal cuts are given for the young rhizome. All the decapitated buds are covered with the formulated substrates.

Figure 5. Secondary Decapitation of Cardava Suckers

6. Secondary bud formation – According to the literature reviewed, four to five secondary buds emerge from each primary bud within twenty days. However, this step is still being evaluated.

Figure 6. Secondary Bud Formation of Cardava Suckers

7. Separation of plantlet – Each primary bud if left without decapitation for secondary bud formation will produce a plantlet with well-developed roots. These well-developed plantlets can be planted directly to the main field without hardening or they can be placed on potting bags.

Figure 7. Separation of Cardava Plantlets and Bagging

Statistical Analysis of Data

Statistical analysis using a freeware version of the SPSS software was utilized. The mean average number of days for a bud to immerge, the Average number of buds to immerge, shoot diameter, and shoot length were computed. It was further subjected to ANOVA and DMRT. Differences between corresponding control and treatments were considered statistically significant at P < .05.

Results and Discussions

The summarized data, statistical parameters, and results are presented under appropriate headings.

Average Number of Days for Cardava (Dippig) Primary Buds to Emerge on Various Farm Waste Propagation Potting Media

The duration from the planting of corm to the emergence of primary buds varied depending upon the different farm waste propagation potting media utilized in the macro clonal propagation of Cardava (Dippig).

Table 1. Average Number of Days for Cardava (Dippig) Primary Buds to Emerge on Various Farm Waste Propagation Potting Media

Treatments	Number of Days for Cardava Shoot to Emerge (days)
T1: (control) Saw Dust Potting Media	25.6[b]
T2: Soil and Chopped Banana Leaves and Trunk Potting Media	25.8[b]
T3: Soil and Cow Manure Potting Media	26.4[b]
T4: Soil and Mung Bean Pod Hull Potting Media	21.8[c]
T5: Soil and Rice Hull Potting Media	27.9[a]

In terms of the number of days for primary buds to emerge (Table 1), T5 (Soil and Rice Hull potting media had the slowest and longest number of days for the emergence of primary buds at 27.9 days. Meanwhile, T1 (Control, Saw Dust Potting Media), T2 (Soil and Chopped Banana Leaves and Trunk Potting Media), and T3 (Soil and Cow Manure Potting Media) were not significantly different from each other as to the number of days for Cardava shoot to emerge. On the other hand, T4 (Soil and Mung Bean Pod Hull Potting Media) had the fastest and least minimum number of days (21.8 days) for Cardava shoot emergence and was significantly different from the other treatments.

According to Algan et al., (2011), mung beans are some of the important legumes used as green manure. They sustain the productivity of the soil with their high adaptation capability and ability to fix the cavalier nitrogen (Bar et al., 2000). This coincides with the study of the Department of Agriculture in Bangkok Thailand (AGRIS, 2003) where mung bean residue increases soil nitrogen content thus producing higher yields.

Figure 8. Growth of Macro propagated Cardava on Various Substrates as Potting Media

Average Number of Primary Buds to Emerge on Various Farm Waste Propagation Potting Media

Table 2. Average Number of Primary Buds to Emerge on Various Farm Waste Propagation Potting Media

Treatments	Number of Primary Buds to Emerge
T1: (control) Saw Dust	1.6^{b}
T2: Soil and Chopped Banana Leaves and Trunk	1.4^{b}
T3: Soil and Cow Manure	1.4^{b}
T4: Soil and Mung Bean Pod Hull	3.5^{a}
T5: Soil and Rice Hull	1.9^{b}

The average number of primary buds to emerge on the various macro clonal farm waste propagation potting media for Cardava was also investigated in the present study. The result is presented in table 2.

It can be seen that T4 (Soil and Mung Bean Pod Hull Potting Media) had the highest number of primary buds to emerge (3.5 primary buds) which was significantly different from the other treatments. It was followed by T5 (Soil and Rice Hull Potting Media), T1(Control, Saw Dust Potting Media), T2 (Soil and Chopped Banana Leaves and Trunk Potting Media), and T3 (Soil and Cow Manure Potting Media) which were not significantly different from each other.

The higher amount of nitrogen found in Mung Bean Pod Hull enhances the development or emergence of buds in the macro propagated Cardava. According to Suraphon (2012), the higher the nitrogen absorption significantly affects the growth and development of new buds forming new shoots with larger physiological structures.

Average Primary Shoot Stem Diameter on Various Farm Waste Propagation Potting Media

Table 3. Average Shoot Diameter on Various Farm Waste Propagation Potting Media

Treatments	Average Cardava Bud Diameter (cm)
T1: (control) Saw Dust Potting Media	7.4^{b}
T2: Soil and Chopped Banana Leaves and Trunk Potting Media	6.6^{b}
T3: Soil and Cow Manure Potting Media	5.3^{c}
T4: Soil and Mung Bean Pod Hull Potting Media	9.9^{a}
T5: Soil and Rice Hull Potting Media	5.5^{c}

Note: In the average shoot stem diameter column, the same letters of superscript indicate significant difference by DMRT Post Hoc Test ($P>0.05$)

Presented in table 3 was the shoot stem diameter in millimeters in various farm waste macro clonal propagation media for Cardava. The largest shoot stem diameter was noted in T4 (Soil and Mung Bean Pod Hull Potting Media) with a diameter of 9.9 cm which is significantly different from the other treatments. This was followed by T1 (Control, Saw Dust Potting Media), and T2 (Soil and Chopped Banana Leaves and Trunk Potting Media) with 7.4 cm and 6.6 cm shoot stem diameter respectively. While T5 (Soil and Rice Hull Potting Media), and T3 (Soil and Cow Manure Potting Media) have the smallest diameter which is not significant with the other treatments.

Results obtained by Mohamed (2011) in his study show that the incorporation of substrates containing nitrogen significantly increased stem diameter in all treated plants. The increase in the diameter of the stem can be explained that nitrogen can stimulate better development of plants.

Average Primary Shoot Stem Length on Various Farm Waste Propagation Potting Media

Table 4 Average Primary Shoot Stem Length on Various Farm Waste Propagation Potting Media

Treatments	Average Cardava Bud Length (cm)
T1: (control) Saw Dust Potting Media	34.2^{b}
T2: Soil and Chopped Banana Leaves and Trunk Potting Media	32.0^{b}
T3: Soil and Cow Manure Potting Media	24.8^{c}
T4: Soil and Mung Bean Pod Hull Potting Media	46.9^{a}
T5: Soil and Rice Hull	31.2^{b}

Note: In the average shoot stem length column, the same letters of superscript indicate significant difference by DMRT Post Hoc Test (P>0.05)

Table 5 presents the significant differences in the average primary shoot stem length on the various farm waste macro clonal propagation media for Cardava. The result shows that T4 (Soil and Mung Bean Pod Hull Potting Media) have the longest shoot stem length of 46.9 cm which is highly significant as compared with the other treatments. It was followed by T1 (Control, Saw Dust Potting Media), T2 (Soil and Chopped Banana Leaves and Trunk Potting Media), and T5 (Soil and Rice hull Potting Media) with 34.2 cm, 32 cm, and 31.2 cm respectively. The shortest shoot stem length was exhibited by T3 (Soil and Cow Manure Potting Media) with a shoot stem length of 24.8 cm.

According to Jasey (2018), nitrogen which is considered as the building block of life stimulates the development of healthier and longer stems and leaves in plants. The increase in plant height with different nitrogen sources can be attributed to the fact that nitrogen promotes plant growth, increases the number and length of the internodes which results in a progressive increase in plant height (Mohamed, 2011). A deficiency of this can cause lackluster performance by plants including stunted growth.

Conclusion and Recommendations

Findings. Based on the findings of the study, macro clonal propagation of Cardava grows best using the soil and mung bean pod hull mixture as potting media due to its efficacy in promoting faster bud formation, higher number of buds, larger shoot stem diameter, and longer shoot stem length.

Conclusions. It is concluded that incorporation of farm waste materials such as mung bean pod hull with a soil substrate as potting media shortens the number of days for bud formation, higher bud number, larger shoot stem diameter, and longer shoot diameter. The macro propagation technique optimized in the present study is user-friendly, which requires minimum skill and expertise, and is suitable for adoption by farmers at the farm level.

Recommendation. Compared to micro propagated plantlets, macro propagation derived plantlets are more adaptable to the field conditions because they are photosynthetically active as they are regenerated under in vivo conditions, while tissue cultured plants are partially photosynthetic and hence are very delicate and do not establish easily under field conditions.
Macro propagation offers the cheap alternative with tremendous potential for the production of quality planting material in Cardava banana and has higher plantlet productivity when macro propagated using soil and mung bean pod hull as planting substrate.

Acknowledgement

The researches would like to acknowledge the administrators and officials of Abra State Institute of Sciences and Technology, Dr. Gregorio T. Turqueza Jr, College President and Dr. Noel B. Begnalen, Vice President for Academic Affairs for their unending support and encouragement for the successful conduct of this study.

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EDUCATION

Utilization and Integration of Technology Based – Applications for Physical Education Instruction in the New Normal

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Abstract - Educational institutions were forced to move from face-to-face classes to virtual contact as a means of teaching and learning communication due to the pandemic. The word "new normal" arose wherein technological platforms serve as potent tools to reach students and bridge the gap in learning. Technology is changing things in schools, including Physical Education classes. Developing an interest in learning is one of the very important factors that contribute to the success of understanding Physical Education. With that, the paper focused on the utilization and integration of technology-based applications in PE instruction in the New Normal. The study was intended to determine the extent of the utilization of technology-based applications in physical education instruction, as well as the factors and problems encountered in its implementation. Descriptive research was utilized in the study. The majority of respondents are females, between the ages of 36 and 40, hold a Master's degree, and have experience accessing technological platforms via smartphones and wireless internet connections. PE instructors mostly utilize and integrate smartphones, social platforms, electronic games, office tools, chat rooms, and electronic grading and course management tools into their classes. They have the real desire to adapt to online PE teaching and learning with the support of school heads, peers, and family. However, slow internet connections and high data consumption are unavoidable. The relationship among the three indicates that the greater the extent of utilization, the more evident the factors are, and, at the same time, the more problems are encountered. Indeed, the allocation of funds to facilitate strong internet connections that may further enhance teaching and learning sessions in their respective institutions is necessary for the new normal setup.

Keywords - New Normal, Technology-Based Applications, Physical Education, Tertiary Level

Introduction

The world will remember the first quarter of 2020 onward as a time when people of different countries stayed at home in quarantine to safeguard against the Coronavirus pandemic. The global event quickly grew from a health issue to one that affected the economy, communities, and education. With that, the educational system emerges into a new normal set-up. This situation led to the teaching and learning modalities being generated by online platforms, specifically social networks. The new normal forces for advancing technology are focused on program design and delivery, course development, and learning interventions that address the unique needs of the learner with respect to pace, place, process, and learning products (Parrocha, 2020; Pestre, 2013; Williamson, 2013; Daniel, 2020). The educational institutions moved from physical classrooms to virtual spaces or synchronous wherein teachers and learners in online and distance modalities engage in real time and asynchronous communication allows for a little delay in feedback and engagement between teachers and learners as a means of learning communication. Nowadays, the classroom is apparently intangible, no longer in buildings but websites, virtual and not real, hence affects both student learning and school organization. Definitely, in the new normal set-up, technological platforms serve as potent tools in order to reach students and bridge the gap in learning. The implementation of technology in school has the capacity to improve teacher-student relations and support in making teaching and learning more meaningful and fun. The learners can also work through technological applications among their peers. Before, the teacher's practical demonstrations and students' simulations served as the core of teaching and learning the Physical Education subject. In today's educational landscape in PE, digital and networked technologies are seen to be useful in making students engage in physical activities. The extensive use of online platforms has resulted in scholastic mobile applications. Increased utilization and integration of cloud-based technologies such as the internet, email and e-learning platforms is observed in Physical Education subjects, so quality teaching and learning is highly achievable.
Methodology

The study employed quantitative analysis of data and emphasizes the use of calculation techniques like questionnaires and surveys. The research took the use of descriptive-surveys to arrive at different conclusions. The objective of the research is to assess the possibility of various conditions that are obtainable (Burns and Grove,2016). More so, it was utilized to define and characterize the nature of observations. The census is to explain fundamental facts based on the actual population at a given point in time. Lastly, the application of descriptive analysis seeks to map out the physical features of a particular subject. The participants covers 181 Physical Education instructors employed in State and Local Universities and Colleges.

Results and Discussions

The majority of the respondents are females, belong to the age bracket of 36 to 40 years old, Master's Degree Holder, have a background in ways to access technological platforms through smartphones and wireless internet connection.

Table 1 covers the extent of utilization of technology-based applications for PE in terms of teaching-learning, physical activity technologies, communication and web based. Smartphones are used for easy upload and download of learning materials together with Zoom and Facebook applications for disseminating information and virtual discussion. The result indicated that most of the instructors utilizes smartphones as means of transmitting information regarding with the physical education lessons. More so, smartphones are deemed to be a friendly gadget thus made everything reachable through touch. Hence, it has a huge place and impact in daily routine that can also be applied in the field of Physical Education teaching – learning process. Meanwhile, educational games serve as springboard for motivating the class and office tools helps in presenting the important topics in Physical Education. The result indicated that the respondents are making ways to make online classes fun while learning. Ventures in educational games can be possible through virtual Physical education streaming and online videos. With that, students tend to move even at home in order for them to understand the concepts of Physical Education. The findings supported the study of Mollie (2017) wherein student involvement enable them to feel responsible for their own learning. Chat rooms are created for simple conversations and announcement through social network to familiarize and engage with the students. Indeed, most of the instructors communicate and inform and update the class through chat box. Since the educational system suffers from COVID-19 19, social platforms became necessary in communication. It is not just utilized for simple conversation hence organized to facilitate exchange of information.

Lastly, electronic grading, course management tools and online research tool are utilized to facilitate learning in Physical Education subjects. Most of the instructors encode their grades electronically. Nowadays, schools acquire learning management systems (LMS) to offer best practice learning experience among their students thus e- grading are included in the package. The utilization of technological tool in Physical Education teaching ease the workload of teachers hence provides the students with meaningful platform for gathering researches. So, technology intensifies learning however it cannot be a substitute for Physical education instructors in transmitting information and skills relevant to its instruction. The PE instructors serves a key role in bridging technology into Physical Education.

Table 1. Utilization of Technology - Based Applications for Physical Education instruction

Physical Education Instruction	Technology Based Applications	
Teaching and Learning		
	Smartphones for easy upload and download of learning materials	Highly Utilized
	Zoom and Facebook applications for disseminating information and virtual discussion	
		Utilized

Physical Activity Technologies	educational games as springboard and motivation of the class Office tools to present the important topics of Physical Education	
Communication	chat rooms for simple conversations and announcement social network to familiarize and engage with the students	Highly Utilized
Web based Technologies	electronic grading for accuracy course management tools to facilitate teaching physical education subjects	Utilized

Table 2 presents the factors contributing to technology-based instruction of Physical Education. Teachers' have the real desire to engage in technology as means of instruction and motivation of school heads, peers, family and students. Inevitably, most of the instructors are passionate in technology use. It is noted that creative training experiences utilize various kinds of tools to improve the amount and proficiency of students' behavior towards Physical Education. Vahey and Crawford (2012) pointed out that physical education teachers seem less willing to embrace innovation. In similar vein, colleagues can contribute to technology application in PE instruction. Physical Education instructors need motivation in order to facilitate technology in teaching. Attitudes and practice have an impact on technology usage. Attitudes aid in the decision-making of an instructor, thus can help learners discern why they incorporate particular technology tools for PE instruction. Probably, teachers have to utilize computers, hence behavior and expertise are considered factors.

Table 2. Factors Contributing to Technology - Based Applications in Physical Education

	Contributory Factors	
Technology – Based Applications in Physical Education	Motivation of school heads, peers, family and students Colleagues who believe in incorporating technology The students' desire to use technology The motivational aspects the technology brings to my students Teachers real desire to engage in technology as means of instruction	Evident

Table 3 presents the problems encountered in the utilization of technology platforms in physical education. The respondents agreed that they experienced problems with internet access and that the connection functioned slowly, as well as seeing that video presentations consumed a lot of data. ICT has changed the human condition from an information age to a wisdom age. ICT is rising quickly amongst students. The need for the quick deployment of ICTs has therefore become a topic of considerable interest to all of humanity. Without a doubt, these tools have become an essential element in contemporary life. Therefore, having fast and consistent internet connectivity in the country is strongly recommended to further close the distance in education and learning. collaborating with the right people and technicians knowledgeable in the use of Wi-Fi, identifying the perfect location of the kit to access the internet. The purchase of Wi-Fi technology equipment or devices and installation can enable the school and teachers to utilize the faster service of the service provider (Fabula, 2018). Video presentations that make use of a lot of data. With that, most of the materials for teaching and learning physical education are through videos. Most local and state institutions cater to financially challenged students, so load problems are unavoidable. At the moment, videos are necessary for the demonstration of skills, and at the same time, they are seen as the easiest way to record movement for assessment and evaluation. The findings were supported by Phillips et al. (2014), who found that utilization of videos has been adopted by PE practitioners as a tool to monitor students' physical activity, to motivate students to practice, to amend efficiency and technique, as well as introduce new techniques to the ability. Physical education relies on practical demonstrations and sports simulations. The researcher deemed that problems occur since teachers and students need to learn the correct and proper ways of movement relevant to physical education lessons. Nevertheless, the use of technological resources as well as having impartial indicators of activity ratings may support teachers and students in achieving the goals of physical education.

Table 3. Problems Met in the Utilization of Technology-Based Applications in Physical Education

Physical Education	Problems	
Technology-Based Applications	The internet access and connection function slowly. There are some Physical Education lessons where technology application is too difficult to prepare/utilize. The allowable time for each lesson is not enough to utilize technology applications in discussions. There are difficulties encountered in assessment and evaluation. Video presentations utilized consume a lot of data	Agree

Table 4 shows the relationship among factors contributory to technology-based instruction, extent of utilization of technology-based applications and problems met in the utilization of technology-based teaching and learning in PE. Based from the result, the computed r-values indicates a strong positive correlation on the extent of utilization of technology-based applications and weak positive correlation on the problems met in the utilization of technology-based teaching and learning. This shows that there was significant relationship exists and the result implies that the more evident are the factors, the greater the extent of utilization and the more problems encountered. Putting technologies in place for physical education adoption necessitates new hardware, applications, philosophies, styles, and policy adjustments. Faculty and teachers are forced to fulfill the evolving demands of learners, thus harnessing pedagogically sound innovations. Technological progress in education has gained a considerable amount of interest, but study has largely involved the Internet and information technology when it pertains to this problem.

Table 4. Relationship Among Factors, Extent of Utilization and Problems Met in Technology - Based Applications in Physical Education

Factors Contributing to technology Based Applications	r-value	p-value	Interpretation
Teaching - learning technologies	0.662**	0.000	Highly Significant
Physical Activity Technologies	0.606**	0.000	Highly Significant
Communication technologies	0.677**	0.000	Highly Significant
Web-based technologies	0.718**	0.000	Highly Significant
Problems Met in utilization of technology-based teaching and learning in Physical Education	0.303**	0.000	Highly Significant

Conclusion and Recommendations

The majority of the respondents are females, belong to the age bracket of 36 to 40 years old, Master's Degree Holder, have a background in ways to access technological platforms through smartphones and wireless internet connection. Regarding the extent of utilization of technology – based tools and applications for instruction, Physical Education instructors use smartphones, social platforms, electronic games, office tools, chat rooms, electronic grading, and course management tools. Referring to factors contributing to the integration of technology-based application, teachers have the real desire to adapt in online teaching and learning Physical Education courses thus supported with school heads, peer and family. In terms of problems met, slow internet connection and high consumption of data are felt. It is found that there is a significant relationship among the three which indicates that the greater the extent of utilization, the more evident are the factors and, at the same time, the more problems encountered. So, a technology – based instruction plan was proposed for Physical Education teachers. With this, the institutions may seek help from the national and local government units for the allocation of funds to facilitate strong internet connections that may further enhance teaching and learning sessions in their respective colleges and universities. Hence, Physical Education teachers may use the technology-based application plan for instruction to cope with the demands of the new normal set-up in education. On a large scale, the community can be guided by the findings of the study since physical activity technologies will be of great help in promoting a healthy lifestyle among its citizens.

Acknowledgement

The author is eternally grateful for the wisdom and strength bestowed by God the Father, through the intercession of His Son Jesus Christ and Mama Mary; for the love and support of her family, the participants the CLB family and APCORE community.

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Assessment on the Effectivity of Online Asynchronous Mode of Instruction to Students' Performance in Mathematics

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Abstract - Asynchronous mode of instruction is popular e-learning mode that is commonly used in distance learning education. This study aimed to assess on the effectiveness of the online asynchronous mode of instruction to the Mathematics performance of the Second Year BSED major in Mathematics students of Iloilo Science and Technology Miagao Campus during the First Semester, A.Y. 2020-2021. A questionnaire was used to collect data for this study. The twenty-four (24) Second Year BSED Mathematics students were asked to complete a set of questionnaires consisting of demographic information such as internet speed and means of studying in their asynchronous mode of instruction. To assess the effectiveness of online asynchronous mode of instruction to their mathematics performance, the researchers sent a letter of permission to their subject teacher requesting for the Final grade of the respondents in Math 105: Logic and Set Theory. All the information's gathered were treated in the strictest confidence. The subject Math 105: Logic and Set Theory is being offered to the Second Year BSED Mathematics during the First Semester of the Academic Year. The findings showed that there is no significant difference in the Effectivity of Online Asynchronous mode of instruction to student performance in Mathematics when categorized according to internet speed and means of studying. The study concluded that internet speed and means of studying has no direct impact to students' performance in Mathematics.

Keywords - Assessment, Online Asynchronous mode of instruction, Internet Speed, Means of Studying, Academic Performance in Mathematics

Introduction

The most recent public health emergencies of global concern – the COVID-19 pandemic has brought extraordinary challenges to the world especially in the implementation of plans and procedures about how to contain the virus while infections are continually rising. In order to avoid the infection, containment, mitigation, contact tracing, self-isolation, social distancing, wearing of face masks, improved health care systems; hand-washing and surface cleaning is recommended by the World Health Organization (WHO, 2020) The fight against the threats to COVID-19 pandemic suffered profound effects and impacts on almost all sectors in the human race and have resulted in the widespread disruption such as travel restrictions (Chinazzi et al., 2020), closure of schools (Viner et al., 2020), global economic recession (Fernandes, 2020), political conflicts (Barrios & Hochberg, 2020), racism (Habibi et al., 2020), and misinformation and controversies (Enitan et al., 2020), to name a few. One of the most affected is the educational sectors. The pandemic has created a large disruption in the educational system which forced schools to shift from traditional forms of teaching to a "new educational norm" (Tria, 2020) which is an assimilation of online and blended learning. Online education is becoming the new normal in academia, but it is a development that may be posing a conundrum to some (Khalili, 2020), especially to Iloilo Science and technology University (ISAT-U) Miagao Campus students given the nature of the learning set-up and the lack of technological means and other related issues therein- to mention.

Thus, the quantitative study aims to assess the effectivity of online asynchronous mode of instruction to the performance in Mathematics of selected BSED Mathematics students of ISAT-U Miagao Campus. Researchers and related studies posits that students needs in learning are the utmost priority in every change that occurs in the education process. Based from the related studies, providing modules for students is also an effective kind of gaining learning. However, the lack of resources for students as well as instructors causes difficulty in learning especially Math 105: Logic and Set Theory. While some articles and studies also discussed that there are diverse effects of slow internet connectivity to students' academic performance in school. Moreover, studies suggest that distance learning has been a challenge to mathematics educators due to the lack of face to face interaction with learners that can easily be miscommunicated or misdelivery during online instructions. Additionally, while technology has been used for many years to support teaching and learning process. According to Onlinger and Maruyama (1996), there is no single best method of education because students have different learning styles, needs, and preferences.

Overall, studies suggest that students need to learn at their own pace. Researchers believe that online mode of instruction can have both its benefits and challenges.

Methodology

This study used the descriptive method of research. Descriptive research uses a quantitative method by collecting quantifiable information to be used for statistical analysis of the population sample. According to McCombes, S. (2020) descriptive research aims to accurately and systematically Internet Speed Means of Studying Mathematics Academic Performance describe a population, situation or phenomenon. It can answer what, where, when and how questions, but not why questions. A descriptive research design can use a wide variety of research methods to investigate one or more variables. This method was used in this study because it aimed to gather information in the effectivity of online asynchronous mode of instruction to the Second Year BSED Mathematics Students and their performance in Mathematics when grouped according to internet speed and means of studying. The respondents of this study were the twenty-four (25) Second Year BSED Mathematics students of Iloilo Science and Technology Miagao Campus who were officially enrolled during the First Semester, A.Y, 2020 -2021 who were purposively chosen to be the respondents of this study. Along the semester, one (1) student officially dropped the course so there were twenty-four (24) students considered to be the respondents of this study. The part of the questionnaire was designed to obtain information on the demographic characteristics of the respondents such as internet speed and means of studying. In order to measure the Effectivity of online asynchronous mode of instruction, the researchers asked the Final grades of the student in the subject MATH 105: Logic and Set Theory. Respective numerical weights were assigned for statistical analysis. The respondents made a set of questionnaire consisting of demographic information such as internet speed and means of studying during the asynchronous mode of instruction which were designed to gather data in this study. After all the recommendations have been taken into account and has been decided that the instrument is accurate and valid, an informed consent was given to the respondents. However, due to the COVID-19 threat, the researchers opted to distribute the instrument through an online platform (Facebook Messenger) and Google Email. To assess the effectivity of online asynchronous mode of instruction to their mathematics performance, the researchers sent a letter of permission to their subject teacher requesting for the Final grade of the respondents in Math 105: Logic and Set Theory. All the information's gathered were treated in the strictest confidence. The data gathered were tallied, tabulated, and subjected to statistical computation. The following are the statistical tools employed in analyzing the data: For descriptive data, percentage, mean, and standard deviation were used while t-test and ANOVA were used in the inferential data analysis. Mean was employed in describing the level of effectivity of the online asynchronous mode of instruction in the Mathematics performance of the Second Year BSED Mathematics students of ISATU Miagao Campus when taken as a whole and when grouped according to internet speed and means of studying. For inferential data, t-test was used particularly in finding out if there is a significant difference in the effectivity of the online asynchronous mode of instruction in the Mathematics performance of the Second Year BSEd Mathematics when grouped according to internet speed while ANOVA was used in finding out if there is a significant difference in the effectivity of the online asynchronous mode of instruction in the Mathematics performance of the Second Year BSEd Mathematics when grouped according means of studying. The level of significance is set at 0.05 alpha level. The data was processed through Social Package for Social Sciences version 20.

Results and Discussion

This chapter presents the descriptive and inferential analyses of the data to determine the effectivity of online asynchronous mode of instruction to the Second Year BSED Mathematics Students in their performance in Mathematics. Specifically, this study sought answers to the following questions: 1. What is the level of effectivity of the online asynchronous mode of instruction in the Mathematics performance of the Second Year BSED Mathematics students of ISAT-U Miagao Campus when taken as a whole and when grouped according to internet speed and means of studying? 2. Are there significant differences in the effectivity of the online asynchronous mode of instruction in the Mathematics performance of the Second Year BSEd Mathematics when grouped according to internet speed and means of studying?

Part 1. Descriptive Data Analysis

Table 1. Frequency and Percentage of the Respondent's for Identified Variables

Variable	N	%
Internet Speed		
Slow	8	33.33
Moderate	16	66.67
Fast	0	0
Means of Studying		
Cellphone	21	87.50
Laptop	2	8.33
Computer	1	4.17
Tablet	0	0
Total	24	100

Table 2. Level of Effectivity of the Online Asynchronous Mode of Instruction in Mathematics Performance of the Second Year BSED Mathematics when taken as a Whole and when Classified According to Internet Speed and Means of Studying

Variable	M	SD	Description
Internet Speed			
Slow	88.25	1.91	Effective
Moderate	86.50	3.46	Fair Effective
Means of Studying			
Cellphone	86.90	3.16	Fair Effective
Laptop	90.00	.00	Effective
Computer	85.00		Fair Effective
As A Whole	87.08	3.106	Effective

Part II. Inferential Data Analysis

Table 3. Differences of the Level of Effectivity of the Online Asynchronous Mode of Instruction in Mathematics Performance of the 2nd year BSED Mathematics in terms of Internet Speed

Variables	M	df	T	p	Remarks
Internet Speed					
Slow	88.25	22.00	1.594	.125	Not Significant
Moderate	86.50				

Table 4. Differences of the Level of Effectivity of the Online Asynchronous Mode of Instruction in Mathematics Performance of the 2nd year BSED Mathematics in terms of Means of Studying

Variables	M	$F_{(24, 2)}$	p	Remark
Means of Studying				
Cellphone	86.90	1.157	.334	Not Significant
Laptop	90.00			
Computer	85.00			

Conclusion and Recommendations

Based on the results, the following conclusions were drawn:

Most of the respondents have moderate internet speed and have used cellphone as their means of studying which were both “Fair Effective” level of effectivity. Regardless of the internet speed and means of studying, the effectivity of online asynchronous mode of instruction to student performance in Mathematics is “Effective” which means that they have good performance in Mathematics. The internet speed and means of studying has no direct impact to students’ performance in Mathematics. There was no significant difference in the Effectivity of Online Asynchronous mode of instruction to student performance in Mathematics when categorized according to their internet speed, and means of studying.

In light of this findings, taken as a whole, Online Asynchronous Mode of Instruction to Students’ Performance in Mathematics as perceived by the students’ is effective. Thus, it may be recommended that the curriculum designers may design strategies that would heighten learner’s attention span and engagement in the asynchronous environment of learning. In this way, learners may take time and effort to participate to every part of the discussion. The teacher/professors may be also improved and conduct new study related to this kind of research so that it is easy for them to determine those factors perceived by the students. With that, they can address it properly and be able to deliver their instructions smoothly. The administrative personnel’s, may also take part on delivering technical support for the professors encountering technical difficulties with their discussion under remote-learning set-up. The students may open their minds to the possibility in overcoming those factors since we are experiencing a crisis and we hadn’t cope with the situation yet. Finally, the Researchers may go into further investigation and studies regarding with the effectivity of asynchronous learning and further substantiate the result of this study.

Acknowledgement

The researchers would like to express their sincere appreciation and gratitude to the following for their valuable support, assistance and cooperation that lead to the success of this research endeavor

Dr. Sandra T. Examen, campus administrator, for allowing the researchers to conduct this study;

Prof. Edsel Coronado, research instructor, for imparting his knowledge about research and for checking the manuscript in order to come up with a good output;

Prof. Lorelie G. Sabando, research paper adviser, for the encouragement and selfless help in sharing her knowledge on this study;

Prof. Sharon G. Perucho, research specialist, for giving suggestions and for helping the researchers improve their paper;

Prof. Bema Rita Diesto, editor/reader, for her patience, valuable support, encouragement and for sharing her time and effort in rigidly reading and checking the paper which inspire the researchers until the completion of the study;

The respondents, who cooperated and honestly answered the question

The researcher's beloved parents and guardians, brothers and sisters, for the prayers, love and concern that served as inspiration for the researchers;

The researchers' friends and classmates and whose names were not mentioned but had greatly helped in one way or another;

Above all, to the Almighty Father, who is the great provider of will, strength, wisdom and countless blessings.

Thank you so much!

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Student's Perception and Readiness for E-learning in the Study of Medical Technology

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Abstract - With the emergence of the pandemic and the "new normal," e-learning has become a promising solution for universities worldwide. E-learning is the current integral medium of education that makes use of electronic resources. This study is intended to examine the readiness to e-learning and awareness of learning technologies of undergraduate students of Medical Technology. This study specifically used the descriptive-correlational survey method to correlate the students' perception to their preparedness about e-learning. Questionnaires were deployed online through social media to the selected participants from the Faculty of Pharmacy's 2nd, 3rd, and 4th-year Medical Technology students. The data gathered were subjected to statistical analysis using the SPSS software. Analysis of all results was performed using the measures of central tendency, analysis of variance (ANOVA), and Pearson's R correlation. Ethical considerations were provided to ensure that there were no moral and legal rights that were violated. Limitations, as well as possible research directions, were also discussed. The study determined four common problems experienced by the medical technology students with regards to the use of online resources for e-learning, namely, lack of access to a dependable computer, lack of antivirus software installed on computers, lack of knowledge to utilize online libraries, and other resource databases, and inability to resolve common errors.

Keywords - Learning environment

Introduction

Information Technology (IT) and interchanges advancements are unavoidable in all social perspectives, including the instructive or educational, because they need data or information beyond geographic borders (Lopez, 2006). According to Wenceslao (2015), education as a process includes the sharing and dissemination of information from one entity to another that aims to equip students with the information required to thrive in our world today, the reason why we treat education as a necessity. The necessity for education in the whole world, including the Philippines, was being tested when the coronavirus disease 2019 (COVID-19) forced educational institutions to stop face-to-face learning activities and abruptly shift to an online curriculum. Thus, a need for e-learning was being pushed. Such IT and communications technology will provide opportunities, especially for higher education institutions like the Catholic University of Manila, to enhance the learning environment and administration implementation towards module delivery and support.

According to Wentling (2008), E-learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This provides a wide range of systems that fall into the e-learning purview, including using e-mails and accessing the coursework online. Generally, the use of e-learning as a medium for education in the Philippines is one of the technical problems to consider regarding the abrupt shift in the curriculum due to the lack of finances to buy ICT gadgets and lack of internet connectivity. The key for successful e-learning involves a systematic approach and process, design, development, evaluation, and implementation of an e-learning platform where learning and teaching are actively fostered and delivered (Pirani, 2004). In a higher educational institution like the Catholic University of Manila, the blackboard was another form of a learning platform even before the pandemic happened. The only different thing is that the programs and courses offered are delivered entirely via an e-learning medium. Considering the said shift of curriculum, there are many things to consider regarding the adaptation and adjustments of both the faculty and the students. There are a lot of problems that may arise due to e-learning. These might include several aspects such as mental, physical, environmental, and financial. According to Sener (2016), several disadvantages of e-learning have slow internet connectivity, limited student feedback, lost track of course activities and deadlines, feeling of isolation from teachers and classmates, unavailability of the instructor when a student needs clarification, gadgets to be used, laboratory work is challenging to simulate in a virtual classroom, etc. Thus, such barriers are the things to consider, especially in higher institutions since their field of work includes theoretical knowledge and practical and hands-on skills.

This study aimed to examine the readiness for e-learning and the consequences associated with the use of digital technology. Additionally, this research also aimed to examine the perceived consequences of students studying at the Catholic University of Manila to identify some characteristics that may affect the adoption of e-learning.

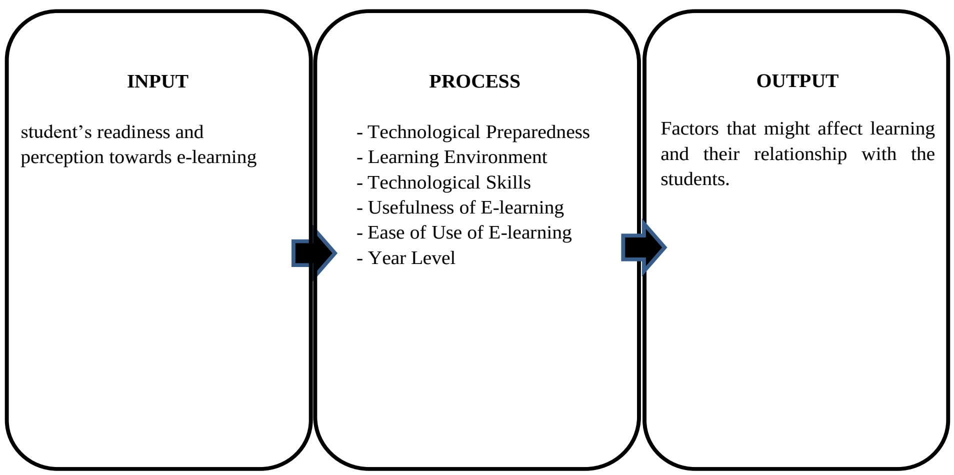

Figure 1. Input-Output Model based on the Unified Theory of Acceptance and Use of Technology

Methodology

The researchers utilized the non-experimental quantitative study using a cross-sectional technique. The researchers used quantitative research to establish a relationship between the independent and dependent variables of the study. It is also non-experimental in nature because it does not involve the manipulation of independent variables studied under this research (Polit et al., 1987). The researchers specifically used the cross-sectional survey method to correlate the students' perception of their preparedness regarding e-learning. This helped the researchers generate a clear picture of the effectiveness of e-learning as perceived and experienced by the 2nd, 3rd, and 4th-year Medical Technology students studying in a Catholic University in Manila. Since the study employed the descriptive method, detailed and factual data collection was performed to describe the phenomena. This method allowed the researchers to describe the areas of interest accurately and precisely systematically. Additionally, it provided a better understanding of the situation by describing the behavior of the respondents in this study. An online Likert scale questionnaire was also adopted as the research instrument.

In collecting the study's data, the researchers utilized a stratified proportional random sampling method to select participants from the 2nd, 3rd, and 4th-year Medical Technology students of the institution. The usage of strata was exhibited in this study to divide the totality of the Medical Technology students studying in the Catholic University of Manila into second, third-, and fourth-year Medical Technology students. Also, proportionally was practiced in sampling to determine the optimal number of respondents per year level. This is important because some year levels are more populated compared to the other year levels. Subsequently, questionnaire consent forms were sent out to the potential respondents of the study to inform them about their rights, the purpose of the study, the procedures to be undergone, and the possible risks and benefits of participation. After obtaining the consent forms from the respondents, the questionnaires were digitally distributed to the selected participants. The participants were tasked to answer the questionnaires truthfully. Thereafter, the researchers collected the answered questionnaire forms tallied, analyzed, and interpreted by a statistician.

The deployment of questionnaires was done online through social media platforms. The research students from the 2nd year-4th year allied health students, specifically the Medical Technology students from the Faculty of Pharmacy. Based on the Raosoft sampling size calculator, the population size of 1665 since the researchers set each block to a maximum of 45 students. There are 37 blocks from the given year level. Each block was assigned with a representative that helped in the deployment of the questionnaires. Before answering the questionnaire, respondents were given a questionnaire consent form indicating that it is voluntary and their confidentiality is highly protected. There commended sample size based on the population size is 313 respondents, with a confidence level of 95% and a margin of error of 5%. The questionnaires were then deployed to the 37 blocks, with the presidents being the representative. Each block has at least nine (9) respondents.

In this study, however, the researchers could not reach the 9-respondent threshold for each block due to the lack of respondent voluntariness exhibited by most blocks. To get the names of the block presidents, the researchers coordinated with the Faculty of Pharmacy Student Council Administration Committee. Instructions were sent to the block presidents to deploy it to their specific blocks via the use of google forms. If the student chose not to answer the survey, they were not given access to see the questionnaires. In the google forms, the letter of consent was the first one they saw upon opening the forms and their specific information, including name (optional), year and section, and age. The last option in the consent form asks the willingness of the respondents to answer the survey. If they answered "no," they can't continue to the next page where the questionnaire is. Also, if they chose "no," it has a submit button of response so that the researchers also have a tally of how many students declined to answer the survey. There was a total of 37 blocks that participated in the study. These include 11 blocks from the 2nd year, which had a total of 80 students, 21 blocks from the 3rd year, which was equal to 131, and 5 blocks from the 4th year students, which had 25 respondents. The researchers allotted one month for the data collection of each block which was done asynchronously. The researchers set a specific date for the data collection to be accomplished. 1st-year students were excluded from being a respondent because it was stated in the criteria that the respondents should have at least experienced the face-to-face learning of the university to have it compared to e-learning. Since the school year started online, the researchers decided to exclude them. Withdrawal of respondents includes students who did not answer at least 50% of the questions.

Results and Discussions

In this study, e-learning as a medium of education in the Medical Technology students under the CMO No. 4, Series of 2020 was assessed through the level of preparedness and perception. The level of preparedness in this study was described using the mean and standard deviation. As reflected in the table, the second-year students with a mean of 3.911 are moderately prepared. The third-year students with a mean of 3.926 are also moderately prepared. When taken as a whole, the Medical Technology students are moderately prepared with a mean of 3.930.

Table 1. Student's Preparedness for e-learning in the Study of Medical Technology

Year Level	N	Mean (X)	Std.	Interpretation
Second Year	80	3.911	0.306	Moderately Prepared
Third Year	131	3.926	0.297	Moderately Prepared
Fourth Year	25	4.015	Std.	Moderately Prepared
Total	236	3.930	0.306	

Table 2. Common Problems Experienced for e-learning in the Study of Medical Technology

Most Common Encountered Problems	N	Mean	Std. Deviation
1. I do not have access to a dependable computer (in school, cafes)	23 6	4.83	0.387
2. I do not have antivirus software installed on my computer.	23 6	2.69	1.390
3. I cannot resolve common errors while surfing the internet (e.g., a page cannot be found or connection timeout).	236	2.47	1.190
4. I do not know how to utilize online libraries as well as other resource databases.	23 6	2.61	1.171

The table above shows the common problems experienced by medical technology students when it comes to how prepared they are for e-learning. Suppose we are going to categorize the common problems encountered. In that case, the first and most common among the students is their lack of access to a dependable computer (in school, cafes) with a mean of 4.83, followed by the lack of antivirus software installed on a computer with a mean of 2.69, next is their lack of knowledge to utilize the online library as well as other resource databases with the mean of 2.61, and lastly is the inability to resolve common errors while surfing the internet (e.g., a page cannot be found or connection timeout) with the mean of 2.47.

Table 3. Perceptions of Medical Technology Students Towards E-learning.

		Usefulness of E-learning	Ease of Use of E-learning	Year Level
Usefulness of E-learning	Pearson Correlation	1	0.664**	-0.004
	Sig. (2-tailed)		0.000	0.946
	N	236	236	236

Ease of Use of E-learning	Pearson Correlation	0.664**	1	0.049
	Sig. (2-tailed)	0.000		0.455
	N	236 236	236	236 236
Year Level	Pearson Correlation	-0.004	0.049	1
	Sig. (2-tailed)	0.946	0.455	
	N	236 236	236	236

The table above shows the correlation of the students' perception across the different year levels in medical technology. Based on the data above, the usefulness of e-learning exhibits a moderate positive correlation with ease of use of e-learning (r = 0.664) while a very weak negative correlation with year level (r = -0.004). The ease of use of e-learning, on the other hand, exhibits a moderate positive correlation with the year level (r = 0.049).

A Likert scale was used in assessing the student's preparedness and was based on three aspects: the learning environment, technical preparedness, and technical skill preparedness. Results per year level showed that both the second-year student and third-year students are moderately prepared. And the students of Medical Technology, in general, are moderately prepared for e-learning. In the study of Beer & Slack (2015), a literature review was created about the challenges of e-learning faced by academics in higher educational institutions citing that one of the factors that contribute to e-learning efficacy is e-learning hesitancy. E-learning hesitancy, where the students adjust to the unusual learning set-up and way of learning, creates thinking that learning is not well facilitated. The rapid pace of embracing e-learning technology has ramifications on academic staff and students. It creates unwanted pressure, and the results are hard to monitor whether e-learning technology is being used effectively (Clegg et al., 2003). Thus, this is also one of the factors that can be considered why e-learning in this higher educational institution results in a moderately prepared level.

In this study, the common problems experienced by students are also determined and were ordered based on the mean. It was found out that the most common problem is the lack of access to a dependable computer (in school, cafes), lack of antivirus software installed on the computer, lack of knowledge to utilize the online library as well as other resource databases, and the inability to resolve common errors while surfing the internet (e.g., a page cannot be found or connection timeout), respectively. In conducting this research, the data were analyzed using the SPSS 20.0 to find out the correlation. For the student's perception, the students were assessed based on the correlation of the usefulness of e-learning, the ease of use of e-learning, and its correlation with the year levels. Results showed a correlation between the usefulness of e-learning and the ease of use of e-learning in a moderate positive correlation with the result of (r=0.664). The correlation of the usefulness of e-learning with regards to the year level is in a very weak negative correlation with (r = -0.004). The ease of use of e-learning, on the other hand, exhibits a very weak positive correlation with the year level (r = 0.049).

Furthermore, to measure the strength of correlation, the p-value is compared with the significance level since the p-value (0.000) is less than or equal to the level of significance (0.05). (Shown in Sig. (2-tailed)) ≤ α (level of significance). It means that there is a significant correlation between the usefulness of e-learning and ease of use of e-learning. This means that the usefulness of e-learning directly increases the ease of using learning online as a medium of education in medical technology. For the p-value of the usefulness of e-learning and ease of use of e-learning and its relationship to the year levels, results depicted that the p-value is 0.946 and 0.455, respectively. This shows a greater value compared to the 0.05 level of significance. Therefore, there is no significant correlation between the usefulness of e-learning and ease of use of e-learning towards the year levels. Due to this result, the researchers tried to analyze why there is no significant correlation between the variables. The reasons showed as follows:

1. The usefulness of e-learning and the difficulty level does not necessarily mean that when one is on a higher year level, they will also have a higher level of expertise since these technical skills vary among individuals.
2. This doesn't also mean that when one is on a higher year level, e-learning would be more useful and more accessible since each year level exhibits a different difficulty in terms of lessons and learning.

Conclusion and Recommendations

The study determined four common problems experienced by medical technology students regarding the use of online resources for e-learning. These problems were determined and ordered based on their respective means. The most common problem encountered by the students is their lack of access to a dependable computer in settings such as schools and cafes. This is followed by the lack of antivirus software installed on computers, then the lack of knowledge to utilize online libraries and other resource databases. The least common problem encountered among the four would be the inability to resolve common errors such as connection timeout and "page cannot be found" while surfing the internet. This indicates shortcomings in e-learning in the study of Medical Technology that affects the students' perception and preparedness for this medium of education.

This study aimed to gather information about the student's perception and readiness for e-learning in the study of Medical Technology. With the results in mind, these are the following recommendations are hereby presented:

1. For future researchers, may this study serve as a benchmark and reference to spearhead more quantitative studies regarding e-learning as a medium in studying other medical-related courses and the courses outside the said profession. It is also recommended that they incorporate other factors in the questionnaire that would help improve and aid in further evaluating the students' acceptance and readiness.
2. For students outside the Catholic University of Manila, may this serve as a reference to help them further understand the most common factors that affect the students in using e-learning as a medium of instruction in studying their chosen profession.
3. For the Professors and Faculty Members, may this study serve as a guide on how to further adjust and adapt accordingly to the most fitted learning process for the students using e-learning in the study of Medical Technology?

Acknowledgment

We would like to thank the Faculty of Pharmacy Research Ethics Committee (FOPREC) for their comments and suggestions to improve our study. We would also want to thank our parents, peers, and friends for their unrelenting support and encouragement for this study. They continuously motivate and support us truly help us even when seemingly insurmountable obstacles lie ahead. Finally, we would like to thank the Lord for making all this possible and helping us succeed with this study.

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Learning Styles and Self-efficacy of Aeta Students and Its Relationship on Their Academic Performance

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Abstract - CHED Memorandum Order No.2 series of 2019 includes strategies on the effectiveness of New IP studies/education subject. The objective of this study is to determine the learning styles and self-efficacy of the Aeta respondents, and how do these factors relate to their academic performance. The study employs the descriptive-correlational research design. A number of 20 Aeta students from DHVSU Porac Extension Campus participated in this study. Result shows that majority of Aeta students' preference falls under Aural learning style, and that there is a detected relationship between their learning style and academic performance. Self-efficacy of Aeta students are of High levels and thus, 50% of the respondents believe that they are capable of achieving their desire. In addition, half of the Aeta students perform proficiently well in class, but the study unveiled that there is no significant association between their level of self-efficacy and academic performance. On the other hand, the most common problems encountered by Aeta students appear to be low self-esteem, academic pressure, and racial discrimination.

Keywords - Learning Styles; Self-efficacy; Aeta Students; Academic Performance

Introduction

Nowadays, seeing Aetas students in universities here in Pampanga may already be a common sight. Overall, the Indigenous Peoples (IP) students are now also given access to a person's right to education. However, due to plenty of factors affecting their studies, IP students may conceivably find it difficult to be used to a normal school setting.

Among ethnolinguistic groups, one of the largest in population in the Philippines are the Aetas, which are the Indigenous Peoples mostly lining in the distinct mountainous locations in Luzon, specifically dispersed in the municipalities of Angeles City, Porac, Guagua and Floridablanca, province of Pampanga. The Aetas can be also found in the province of Zambales and Tarlac (The Outcast Journey, 2018).

According to De Vera (2007), 14% of the country's population are IPs, whom are considered as one of the most disadvantaged and poorest populace of the Philippines as the result of illiteracy, unemployment and lack of basic services due to poverty. However, as stated by Cornelio and De Castro (2016), the Philippines is one of the first Asian countries to have passed laws acknowledging the specific needs of the IPs. The Indigenous Peoples' Rights Act of 1997 is the first law enacted in the Philippines that ensures access to basic health and education of the Indigenous Peoples of the nation.

IPs have the right to self-determination, which determine their political status and freely pursue their economic, social, and cultural development. Various social mechanisms such as migration, colonization, conflicts, and environmental problems inevitably expose the IPs on the verge of cultural and historical loss. Its importance is focused to reclaim their collective and individual right, central to this is education (Tolentino, 2017).

According to Reyes (2014), the Philippine government had aimed to work for the betterment of the lives of its citizens regardless of ethnicity. As a matter of fact, the fundamental law of the land had expressed support regarding the advancement and improvement of the privileges and rights of IPs.

In line with this important issue, the Commission on Higher Education released the Memorandum Order No. 2 series of 2019 which is subjected to the Integration of Indigenous Peoples' Studies/Education into the Relevant Higher Education Curricula. It includes schemes on how to offer IP Studies/Education, training of IP Educators, Effectiveness of New IP Studies/Education subject, and monitoring of Higher Education Institutions offering IP Studies/Education. All of which are for the IP students to be served the equal rights to higher education that had long been attained by other Filipino students.

UNESCO (2010) noticed that IPs face various hindrances to education and are being deserted as far as instructive advancement and change.

Based on the study of Rogayan Jr. (2019), the usual dilemmas that are commonly experienced by the Aetas studying in the university with higher education in a normal setting showed as: verbal bullying, low self-esteem, academic pressure, language barrier, and fear towards teacher. Also, tertiary education functions as political activity, which disconnects indigenous communities from their roots, communities routinely neglect their traditional practices and indigenous knowledge. Therefore, local knowledge and ways of learning are hardly recognize and talked about in universities.

Champagnes (2009) expressed that the principal assurance and guarantee to IP students' development both individually and collectively is attained through education. Education serves as an essential assistant in the realization and pursuit of IP students' cultural, economic, and social development, as well as that of their personal determination.

The influence of the Coronavirus disease 2019 pandemic has brought the Philippines to implement a total lockdown. Moreover, all people regardless of race are affected in different aspects including the area of education (Tria, 2020).

Ingle (2020) addressed that the current situation of the IP students in the new normal setting includes difficulties such as experiencing poor internet connectivity and limited access to technology. The IP students' accessibility of the resources is one problem but another rising concern is the manner by which they can learn through the resources given to them.

According to records, the fairly satisfactory performance of IP students in their academics is mainly caused by the lack of concrete master plans and/or strategic approaches to their own learning process (National Commission on Indigenous People, 2012).

Bayod and Morante (2020) mentioned that IP students shared their concern with the quality of instruction as the new normal setting is as similar as simply self-learning due to least amount of guidance the students get from their instructors, and their inability to stay focus due to their financial needs and new normal difficulties.

Based on the study conducted by Fleming (2006), the VARK learning styles are classified into four modes: visual, aural, read/write and kinesthetic. Visual learners prefer data to show up as diagrams, graphs, and stream outlines. They are also delicate to various or changing spatial courses of action and can work effectively with images. Aural is the most widely recognized mode for data trade which is connected to one's sense of hearing. Aural mode learners acquire information through discussion and listening. Read/Write is coded as the ability to gather and process information through printed text. Kinesthetic learners have the ability to interpret hypothesis through its application. They learn theoretical and dynamic material furnished it shows up with appropriate analogies, genuine models, or representations.

Gokalp (2013) stated that one's efficient and preferred manner of processing and receiving information is referred to as one's learning style. It acknowledges that one's way of acquiring and absorbing knowledge may differ with that of another.

Fleming and Baume (2006) highlighted that learning styles are learners' preferences on acquiring information. Knowing one's preference can be useful to those who will use it to their advantage. However, the quality of data acquired is independent to learning styles. Therefore, it is a lot better if teachers would know the styles and techniques of their students in acquiring knowledge in order to maintain a better teaching-learning relationship.

Banas (2018) stressed that an efficient and healthy teaching-learning relationship may be achieved if teachers know about their students' abilities and characteristics when it comes to acquiring, learning, and processing the information being taught. This success results to better, easier, and more effective learning for the learners. Meanwhile, Flammer (2001) views self-efficacy as one's ability to work for desirable and essential results. People who positively possess confidence are more likely to achieve optimism within them, and produce desired outcomes. On the other hand, if one has a cynical attitude, they will not feel any sense of inspiration and motivation to pursue the things that they set their hands to. According to Lane and Lane (2001), it is stated in most research findings that higher levels of self-efficacy may highly induce success in one’s performance. The significance of the interrelation between the two variables, however, may differ among various studies.

Amid the past two decades, self-efficacy had developed as an exceedingly successful indicator of students' inspiration and learning. As one performance-based degree of seen capability, self-efficacy contrasts conceptually and psychometrically from related motivational builds, such as result desires, self-concept, or locus of control. Analysts have succeeded in confirming its discriminant legitimacy as well as concurrent legitimacy in anticipating common motivational results, such as students' movement choices, exertion, perseverance, and enthusiasm (Zimmerman, 2000).

Methodology

The researchers employed the descriptive-correlational research design to determine the learning styles and self-efficacy of Aeta students and their academic performance. Furthermore, a set of standardized questionnaires were used as a research instrument to correlate and find the significant relationship of the learning styles and self-efficacy of Aeta students to their academic performance.

According to Sousa, Driessnack, and Mendes (2007), the descriptive-correlational design is used to describe the variables, and to associate the natural connection formed between them. Moreover, the mixed approach will be used in the study.

There were 20 respondents who participated in this study. The respondents were Aeta students of DHVSU Porac Extension Campus. The respondents were assessed on their learning styles, levels of self-efficacy, and academic performance.

Purposive sampling technique was utilized to select the respondents through the criteria of being an Aeta student of DHVSU Porac Extension Campus. According to Tiongco (2007), purposive sampling technique is the selection of respondents based on their possessed attributes to preserve the quality of the data collected. Furthermore, the technique is most significant to a particular cultural area with proficient members within.

VARK Learning Styles Questionnaires. These assessed and determined the learning styles of the respondents using the four levels: namely, Visual, Aural, Read/Write, and Kinesthetic. These levels were developed by VARK-Learn Limited (2019).

Academic Self-efficacy Questionnaires. These assessed the self-efficacy of the respondents using the Academic Self-Efficacy Scale -2006 developed by Gafoor & Ashraf (2007).

The questionnaires were forwarded to the respondents, through the IP Coordinator of said extension campus, via Facebook Messenger. They came in two Google Forms that were in English and Filipino, allowing the respondents to choose which version they prefer to answer.

The researchers sought for the permission of the coordinator of the Indigenous Peoples students in DHVSU Porac Campus to conduct the study. The researchers likewise sought for the permission of the respondents who participated in the study.

The researchers also sought the approval of the research adviser for the questionnaires used in the study. The questionnaires were in Google Forms format and were sent by the researchers to the respondents through the IP Coordinator. The researchers also contacted and sent the standardized questionnaires to the president of the Aeta students, who was referred by the IP Coordinator. The confidentiality of the answers of the respondents was guaranteed.

The gathered data and information were tallied, processed, and treated using the following statistical tools below: (1) To describe the Aeta students' learning styles, self-efficacy, and academic performance, weighted mean, frequency and percent distribution as well as standard deviation will be used. (2) To determine the significant impact of Aeta students' learning styles and self-efficacy on their academic performance, regression analysis will be used. (3) To determine the challenges encountered by Aeta students in their learning process, content analysis will be used. The table below will be used for verbal interpretation of data.

Level	Numerical Response	Adjectival Response	Weighted Mean
Very High	5	Strongly Agree	4.21-5.00
High	4	Agree	3.41-4.20
Average	3	Moderately Agree	2.61-3.40
Low	2	Slightly Agree	1.81-2.60
Very Low	1	Strongly Disagree	1.00-1.80

In conducting the study, the researchers upheld proper ethical norms. The honesty, rights, and well-being of the participants in the study were protected by such a standard. The researchers attained approval from their adviser.

To avoid conflicts, the online questionnaires were designed in an accurate and clear manner and were answered by the respondents. Furthermore, the respondents were given adequate time to respond to the online questionnaires in order to collect data with tangible material, and to prevent errors and inaccuracies in their answers. The respondents were assured that the information obtained from them will be treated with strict confidentiality. These were accomplished with the intention to promote trust between the researchers and the respondents.

Additionally, the aforementioned steps adhere to the Philippine Republic Act No. 10173, otherwise known as the Data Privacy Act of 2012, which aims to protect and secure the right to privacy and personal information in terms of communication and information systems both in government and private sectors.

Results and Discussions

1. Descriptive Analysis of Respondents` Learning Styles, Self-Efficacy, and Academic Performance
   1.1 Respondents` Learning Styles

Table 1
Descriptive Analysis of Aeta Respondents` Learning Styles

The most frequent style used among Aeta students is the Aural learning style, which was chosen by 9 out of 20 respondents and thus, outcomes to a 45% rating (Table 1). This means Aeta students learn best when they are listening to lectures and/or voicing out their thoughts. Secondly, 7 out of 20 respondents were determined to have Read/Write learning style. This means that 35% of the respondents prefer to read and/or write down their lessons to understand and grasp its meaning. Kinesthetic learning style ranks third with a 20% frequency.

Learning Styles	Frequency	Percent
Visual	0	00.00
Aural	9	45.00
Read and Write	7	35.00
Kinesthetic	4	20.00
TOTAL	**20**	**100%**

This shows that 4 out of 20 Aeta students are tactile learners, which means that they learn best through application.

1.2 Respondents` Self-efficacy

Table 2
Descriptive Analysis of Aeta Respondents` Self-efficacy

Self-efficacy	Frequency	Percent	Mean	SD	Verbal Description
Very Low	0	00.00	**3.49**	**0.66**	**High Level of Self-efficacy**
Low	0	00.00			
Average	10	50.00			
High	8	40.00			
Very High	2	10.00			
TOTAL	**20**	**100%**			

10 out of 20 or 50% of the Aeta respondents have average levels of self-efficacy (Table 2). This proves that half of the students moderately believe that they will achieve any goal they strive toward. 8 out of 20 or 40% of the Aeta respondents showed high levels of self-efficacy. This means that nearly half of the students believe that they are capable of achieving any result they desire. Lastly, 2 out of 20 or 10% of the Aeta respondents have very high levels of self-efficacy. This shows that 10% of the students firmly believe that they are capable of achieving a desired result. Overall, the self-efficacy of the Aeta respondents has a mean rating of 3.49 with a verbal description of "High Level".

1.3 Respondents` Academic Performance

Table 3
Descriptive Analysis of Aeta Respondents` Academic Performance

General Weighted Average	Frequency	Percent
Beginners (74 and below)	2	10.00
Developing (75-79)	2	10.00
Approaching Proficiency (80-84)	6	30.00
Proficient (85-89)	10	50.00
Advanced (90 and above)	0	00.00
TOTAL	**20**	**100%**

Data reveals that 10 out of 20 Aeta respondents have GWAs ranging from 85 to 89 (Table 3). This means that half or 50% of the respondents perform proficiently well in class. Secondly, 6 out of the 20 Aeta respondents have GWAs ranging from 80 to 84. This shows that 30% of the respondents are "Approaching Proficiency" in their performance in class. Thirdly, 2 out of the 20 Aeta respondents have GWAs ranging from 75 to 79. This means that 10% of the respondents are in the "Developing" stage with regard to their academic performance. Fourth and finally, there are also 2 out of the 20 Aeta respondents who have GWAs that are 74 and below. This shows that 10% of the respondents are in the "Beginners" stage with regard to their academic performance.

2. Test of Significant Relationship of Aeta Students` Learning Styles and Self-efficacy on their Academic Performance
   2.1 Test of Significant Relationship between Aeta Students` Self-efficacy and Academic Performance

Table 4
Chi-Square Test of Association between Aeta Students` Level of Self-efficacy and Academic Performance

Academic Performance

		Beginners	Developing	Approaching Proficiency	Proficient	Total
Self-Efficacy	Average	0	2	2	6	**10**
	High	2	0	4	2	**8**
	Very High	0	0	0	2	**2**
Total		**2**	**2**	**6**	**10**	**20**

Most of the Aeta respondents who have average levels of self-efficacy have proficient levels of academic performance (Table 4). Most Aeta respondents who have high levels of self-efficacy are approaching proficiency with regard to their academic performance. Aeta students who have very high levels of self-efficacy have proficient levels of academic performance.

Chi-Square Tests

	Value	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.600[a]	.596
Likelihood Ratio	5.545	.476
Linear-by-Linear Association	.009	.926
N of Valid Cases	20	

Furthermore, the computed Chi-Square value of 4.600 and T-value of 0.596 implies that there is no significant association between the level of self-efficacy and academic performance of the Aeta respondents. This only means that the self-efficacy of Aeta students cannot be associated nor does it have a significant relationship on their academic performance. This relatively contradicts the claim of Lane and Lane (2001), which argues that having a higher level of self-efficacy highly induces success in a student's academic performance.

2.2 Test of Significant Relationship between Aeta Students` Learning Styles and Academic Performance

Table 5
Chi-Square Test of Association between Aeta Students` Learning Styles and Academic Performance

Academic Performance

		Beginners	Developing	Approaching Proficiency	Proficient	Total
Learning Style	Aural	2	0	2	4	**8**
	Read and Write	0	0	4	2	**6**
	Kinesthetic	0	0	0	4	**4**
	Aural/Read and Write	0	2	0	0	**2**
Total		**2**	**2**	**6**	**10**	**10**

4 out of 8 or half of the Aeta aural learners have proficient levels of academic performance, while two are still in approaching proficiency, and the other two are identified as beginners (Table 5). On the other hand, 4 out of 8 or half of the Aeta read and write learners falls under approaching proficiency. However, two have proficient levels of academic performance. 4 out of 4 or all Aeta kinesthetic learners revealed to have proficient levels of academic performance. 2 out of 2 or all Aeta aural/read and write learners are identified to be on the developing stage.

Chi-Square Tests

	Value	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.444[a]	.017
Likelihood Ratio	11.229	.260
Linear-by-Linear Association	.000	1.000
N of Valid Cases	20	

Moreover, it may be observed that a significant association between the learning styles and the academic performance of Aeta students exists. This means Aeta students' learning styles relates to their academic performance. This supports the argument of Fleming and Baume (2006) which states that knowing a student's preferred learning strategy may be useful to those who will take it to their advantage. Therefore, it would be better if teachers know the styles and techniques of their students in acquiring knowledge to maintain a better teaching-learning relationship.

3. Common Problems Encountered by Aeta Students in the Educative Process

Table 6
Descriptive Analysis of Aeta Respondents` Academic Performance

Common Problems	Frequency	Percent
Low self-esteem	14	70.00
Academic pressure	10	50.00
Verbal bullying	0	00.00
Language barrier	0	00.00
Fear towards teachers	0	00.00
Lack of family support	0	00.00
Racial discrimination	6	30.00
TOTAL	**20**	**100%**

14 out of 20 or 70% of the respondents chose "Low self-esteem" as the most common problem encountered by Aeta students in DHVSU Porac Extension Campus (Table 6). One respondent said, "Iniisip ko minsan diko kaya (Sometimes I think that I cannot do it)".

Another respondent shared, "Dahil minsan nahihiya akong maki salamuha dahil hindi ako kasing talino nila (Because sometimes I am ashamed to socialize because I am not as smart as they are)". Another respondent identified their experience as, "Masakit (It is painful)".

On the other hand, 10 out of 20 or 50% of Aeta students chose "Academic pressure" as the second most common problem experienced by the said respondents. One disclosed, "Dahil sa new norMal education.parang Hindi ako sanay.yung parang kahit mag aaral ako nakikinig ako walang pumapasok sa ulo ko. Tas dala Pato Ng working student ako.minsan talaga.tinitiis ko nalang (Because of the new normal education, it seems like I am not used to it. It seems like even when I am studying, I am listening, nothing enters my brain. I am also a working student, sometimes I really just endure it)".

Another response from the participants said, "Kapag sa mga group nawawalan ako ng lakas ng loob pag halimbawa wala akong maihambag sa kanila (When it comes to groupings, I am losing courage when, for example, I cannot contribute anything to them)". However, despite the academic pressure, one Aeta student identified their situation as, "Masaya (Fun)".

Third ranks racial discrimination which is chosen by 6 out of 20 or 30% of the participants. One participant shared a notable response, "Mailalarawan ko ang aking karanasan kapag nakakita sila ng mga aeta na bumababa sa bayan chaka ka idiscrimenate tatawagin kang baluga at maitim kulot, alam naman nila na aita bat pa sila nag discrimenate pwede naman kapatad ang itawag saamin katutubong aita (I can describe my experience whenever they see Aetas go down town, and then [they] will discriminate you, call you 'baluga,' and dark-skinned, [and] curly. They know [we are called] Aeta, why do they still discriminate when 'kapatad' can be used to refer to us, Indigenous Aetas."

Another notable response from the participants goes, "Minsan nakakawala na nang ganang magpatuloy sa pag-aaral dahil sa mga panghuhusga. Pero sa ngayon binabalewala ko nalang yon, dahil kaya kong patunayan sakanila na kahiy Ayta lang ako is kaya kong sumabay sa kung ano ang kaya nilang gawin. (Sometimes judgments make me lose the desire to continue studying. But right now I am just ignoring that because I can prove to them that even if I'm just [an Aeta], I can keep up with what they can do)".

Conclusion and Recommendations

Based on the findings of the study, it concluded that the learning styles can be associated with Aeta students' academic performance, while their self-efficacy has no significant relationship to their academic performance. This implies that the Aeta students' learning styles, as their teaching or learning strategies, should be taken into consideration in order to achieve effectiveness and visible progress in their educational process.

Additionally, this study received notable responses from 20 Aeta students of DHVSU Porac campus participants and thus, this study has come to a conclusion that the most widely used VARK learning style among the Aeta students is the Aural learning style. The self-efficacy of Aeta students is found to be on the High level, but the study unveiled that there is no significant association between their level of self-efficacy and academic performance. On the other hand, the most common problems encountered by Aeta students lands on Low self-esteem, followed by Academic pressure, and what comes third is Racial discrimination.

Moreover, as the researchers grasp the situation of the Aeta students generally through a follow up question, the researchers concluded that if such issues were left alone, this could impact them gravely and negatively in creating progress in their academic performance.

Generally, the related literature and studies, and the discussion of results intensified the validity of this research due to the support of similar claims, findings and perceptions on the research topic. More importantly, this study accentuates the effectiveness and improvement of the learning and teaching process to the education of Aeta students through the acknowledgement of their common problems encountered as Aeta students, their learning styles, self-efficacy, and its relationship on their academic performance.

The following are the recommendations based on the findings of the study:

1. Conceptualize and apply different teaching strategies that will be suited for the learning capability of Aeta students. This will enhance further their abilities, knowledge, and skills. Also, determining their learning strategies may be a source of motivation in studying.

2. Develop more school programs or activities for the Aeta students that will elevate their levels of self-efficacy. In this way, their self-confidence and self-esteem will be developed and strengthened. The inferiority they may feel toward themselves will be diminished.

3. It is encouraged to conduct similar studies using other possible variables that may affect or may have significant relationships with the academic performance of the Aeta students.

4. It is also encouraged to conduct studies that will not only look into the self-efficacy, learning strategies, and struggles faced by Aeta students alone, but also those by Indigenous Peoples students at large. This is helpful for the betterment of the overall learning experience of IP students in the Philippines, which may positively affect their academic performance.

Acknowledgement

The researchers are grateful to all of those with whom they have had the pleasure to work to accomplish this paper: their research adviser, Dr. Eddiebal P. Layco; their research instructors, Mr. John Reinjoe Namit and Ms. Rizelle Angelica Bituin, their Senior High School class advisers, Ms. Katrine Bonifacio and Mr. Aldrin Parico; the panelists, Mr. Ivan Liwanag, Ms. Sarah Tolentino, Mr. Aldrin Parico, Ms. Jacqueline Magno, and Ms. Maria Faustina Zapanta; the validators, Mr. John Reinjoe Namit and Mr. Aldrin Parico; teacher-researcher, Mr. Danilo Rogayan Jr.; Filipino-major instructor, Ms. Veronica Basa. Last, but absolutely not the least, the researchers are thankful for their friends and families for being sources of motivation during the toughest of times.

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How Do Students in a Specialized Science High School View Earth Science?

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Abstract - This study aimed to explore science high school students' perceptions of Earth science as an academic subject, the motivating factors that influenced them in their Earth science class, and the challenges that they encountered in this course. To achieve this goal, a total of 68 students from a state-run science high school in the Philippines were conveniently sampled to participate in an online survey. Results indicate a general positive attitude towards Earth science. Motivating factors identified by the respondents include their personal motivation to excel, attainment of good grades, influence from peers, teachers, and parents, and firsthand experiences with earth processes. Moreover, challenges such as difficulty in understanding certain concepts or topics, the need for more hands-on activities like laboratory exercises and field work, memorization of terms, time constraints, and other concerns were identified.

Keywords - Challenges; Earth science learning; Motivation; Perception; STEM

Introduction

Earth science is an interdisciplinary science that aims to explore the planet's geosphere, atmosphere, hydrosphere, and biosphere through the integration of concepts in physics, chemistry, and biology (Pyle, 2008; Shen et al., 2016). Dal (2009) further mentioned that Earth science involves the understanding of the planet's composition, structure, dynamics, and history. The Geological Society of America (2016) underscored the roles of Earth science in problem-solving and critical thinking. Global concerns such as energy and resource management, disaster risk reduction, and climate adaptation are better understood with adequate mastery of Earth science concepts.

In the Philippine K-to-12 curriculum, earth and space science topics are integrated in the general science subjects in grade school and junior high school which are deemed learning-centered and inquiry-based (Department of Education [DepEd], 2016). Meanwhile, Earth science is offered as a separate core subject in the Science, Technology, Engineering, and Mathematics (STEM) Strand of senior high school. This course provides a general overview of the earth's materials, processes, and history (DepEd, 2013). It focuses on four main content standards: (1) origin and structure of the Earth, (2) Earth resources and materials, (3) Earth processes, and (4) history of the Earth. The total time allotment for this subject in one semester is 80 hours (DepEd, 2013). Other curricula also include Earth science in its course offerings. For example, the Philippine Science High School (PSHS) System offers Earth science as a subject in Grade 8 with a 0.7-unit loading equivalent to two meetings per week (PSHS, 2015).

In the case of Earth science education, previous researches have tried to characterize students' perceptions about its educational value (Betzner & Marek, 2014; Jolley et al., 2012). These studies have also discussed some of the challenges and motivations that affected science education and Earth science education, in particular. Nevertheless, studies on students' learning difficulties in geoscience education have only started recently (King, 2012). Lewis and Baker (2010) called for a new research agenda that can aid in engaging with the issues confronting geoscience education. However, these discussions on the nature of geosciences have mostly focused on experts' opinions and did not give enough attention to students' perceptions (King, 2012). While existing literature provides a glimpse of Earth science instruction in other countries and how students perceive this subject, there seems to be a shortage of literature describing the case in the Philippine basic education system. It is the aim of the present study to describe the perceptions about Earth science of Filipino high school students whose curriculum emphasizes STEM education.

This study aims to describe students' views on Earth science learning. It will specifically look into the:

1. students' perceptions of Earth science as an academic subject;
2. factors that positively influenced them while taking the course; and
3. perceived challenges that they encountered in fulfilling these course objectives.

Methodology

This study followed a descriptive survey research design. An online survey questionnaire was used to gather students' views on Earth science as an academic subject. Sixty-eight students from a science high school in the Philippines were conveniently sampled to serve as the respondents in this study. These students were required to take an Earth science course in their curriculum.

A letter of request was sent to the school director prior to the conduct of the study and administration of the survey. The respondents were informed that their participation is purely voluntary and that the data gathered in the survey will be used only for the purposes of this research and will be handled with utmost confidentiality. The objectives of the study were likewise explicitly mentioned in the first section of the survey questionnaire.

The survey employed in the present study was developed and adapted based on the Earth Science Student Survey by Betzner and Marek (2014). The first section of the survey sought the respondents' profile including their age, year level, and type of grade school attended. The second section presented the adapted questionnaire which was answered using a five-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree). This section is composed of 11 questions and has a Cronbach alpha value of 0.76 which can be interpreted as fairly high internal validity. The last section of the survey sought the respondents' perceived challenges in their Earth science class (open-ended question) as well as their motivation in this subject (checklist). Descriptive statistics such as frequency, percentage, and mean were used to summarize the respondents' answers.

Results and Discussions

A total of 68 students answered the survey, with 38 males (55.9%) and 30 females (44.1%). As for their year levels, 34 belonged to Grades 8 to 10 while 34 were from Grades 11 and 12. These students were either taking or have taken the course at the time of the survey. Of the total number of respondents, the majority (54.4%) graduated from public elementary schools.

Students' Perceptions of Earth Science as an Academic Subject

The second part of the questionnaire probed the respondents' perceptions of Earth science. The mean and standard deviation per survey item are shown in Table 1.

Table 1. Students' Perceptions of Earth Science

Survey Items	M	SD
(1) Please rate your perceived mastery of Earth science topics (including astronomy, oceanography, and meteorology)	3.24	0.77
(2) I enjoy learning about Earth science.	4.06	0.94
(3) Earth science is equally important as physics, biology, and chemistry.	4.22	0.89
(4) Earth science is as difficult as physics, biology, and chemistry.	3.66	1.05
(5) Earth science helps in preparing students for future careers or jobs.	3.88	0.86
(6) Earth science helps in preparing students for college or university education.	3.85	0.89
(7) Earth science topics are easy to understand.	3.33	1.00

(8) I believe more field trips and hands-on activities will help me better understand Earth science concepts.	4.63	0.62
(9) Compared to physics, biology, and chemistry, lessons in Earth science are more hands-on.	3.67	0.99
(10) I am willing to take a college course related to the Earth sciences.	3.07	1.26
(11) My science classes in grade school provided me sufficient background in Earth science.	3.24	1.01

All the survey items garnered above-average mean (M 3.00). The survey item 'I am willing to take a college course related to the Earth sciences' received the lowest mean at 3.07 (SD = 1.26) while the item 'I believe more field trips and hands-on activities will help me better understand Earth science concepts' garnered the highest at 4.64 (SD = 0.64). With regard to their perceived mastery of Earth science, the average was 3.24 (SD = 0.77).

Based on the results, it can be inferred that the respondents valued field trips and other hands-on exercises in order to develop a deeper understanding of Earth science concepts. Several studies have previously manifested the significance of field trips and other similar activities to learning. Hands-on exercises positively affect students' interest in the activities (Holstermann et al., 2010). Knowledge and motivation are also enhanced through the experiential aspect of field trips (Behrendt & Franklin, 2014). Such activities provide opportunities for learners to acquire new knowledge in a fun and relaxed manner (Ezechi, 2018).

The results also suggest that the respondents considered Earth science as equally important as other courses like physics, chemistry, and biology. The mean score for the survey item 3 'Earth science is equally important as physics, biology, and chemistry' was 4.22 (SD = 0.89). They also enjoyed learning about Earth science as indicated by the mean (M = 4.06, SD = 0.94) for the survey item 2 'I enjoy learning about Earth science.' These findings agree with the observations of Betzner and Marek (2014) which signified more positive perceptions of Earth science among students than teachers and high level of enjoyment in learning Earth science.

Means for survey items 5 'Earth science helps in preparing students for future careers or jobs' (M = 3.88, SD = 0.86) and 6 'Earth science helps in preparing students for college or university education' (M = 3.85, SD = 0.89) indicate that the respondents considered Earth science as useful for their college preparation and future careers. For survey items 4 'Earth science is as difficult as physics, biology, and chemistry' and 9 'Compared to physics, biology, and chemistry, lessons in Earth science are more hands-on,' mean values of 3.66 (SD = 1.05) and 3.67 (SD = 0.99) were recorded.

Perceived Positive Influences in Earth Science

This section answers the second research objective which is to describe the perceived positive influences of the students in Earth science. Respondents found their personal drive to excel and goal to achieve good grades in Earth science as their main motivators. Other factors that have had a positive influence on the respondents include their peers, teachers, and parents. They also noted that firsthand experiences with natural earth processes such as earthquakes and typhoons had an influence on them while taking the subject.

Intrinsic Motivation to Excel

Thirty-nine respondents (57.4%) mentioned that they consider their personal drive to excel as their main motivation in Earth science. Understanding students' learning motivation is crucial because it is a precursor to effective learning and quality education (Yilmaz et al., 2017). Thus, it is vital for educators to consider what propels their students to achieve their learning goals. Students' intrinsic drive to excel is very much related to their achievement motivation (Neigel et al., 2017). People who possess high achievement motivation tend to meet or go beyond some standard of excellence (Awan et al., 2011).

Attainment of Good Grades

The influence of grades on academic achievement has been the topic of long-term debates in education. Some argue that grades are beneficial while others posit the contrary. Reddan (2013), for instance, reported increased motivation, sense of achievement, and enjoyment among students when their course changed its status from being non-graded to graded. The use of grades as a feedback system has also been lauded for its versatility and convenience in summarizing students' performance (Lipnevich & Smith, 2008). Recent studies, however, have interestingly disagreed with the traditional idea regarding the motivational influence of grades among students (Stan, 2012). Grades are alternatively seen to have negative formative effects and negative academic motivation (Chamberlin et al., 2018; Lipnevich & Smith, 2008). Nevertheless, 38 respondents (55.9%) in the present study expressed that achieving good grades motivated them in Earth science.

Motivation from Teachers, Peers, and Parents

Literature has long established the effect of a teacher's expertise, behavior, and practices on the learners' academic success. Blazar and Kraft (2017) found out that students' attitudes and behavior are significantly affected by certain teaching practices which include emotional support. Together with student behavior and classroom climate, teacher behavior is considered to have the most direct impact on student achievement (Huitt et al., 2009). Furthermore, a study exploring students' motivations based on academic publication found similar results describing the high impact of teacher's expertise, management skills, and teaching methods on students' motivations (Yilmaz et al., 2017). The results of the present study indicate that 38.2% of the respondents identified their teachers' expertise and motivation as a positive influence in Earth science.

One-third of the respondents (33.8%) included peer support as motivation in Earth science. Peer support is essential in maintaining a responsive learning environment (Kiefer et al., 2015). Nelson and DeBacker (2008) stated that students who feel valued and respected by their peers generally develop adaptive achievement motivation. Linton, Farmer, and Peterson (2014) presented additional material describing the benefit of cooperation. In a biology course for non majors, they found out that students who collaborated with their classmates scored better on the higher-level, extended-response questions than those who accomplished the activities individually. Din, Ayub, and Tarmizi (2016) registered similar findings among secondary boarding school students with regard to their mathematical engagement. They found out that peer support and parental involvement increased students' participation in their mathematics classes. In this study, 11.6% of the respondents signified that influence from parents affected their academic performance in Earth science.

Firsthand Experience with Natural Earth Processes

One notable finding of this study is the respondents' acknowledgment of the significance of their personal encounters or experiences of earth processes. The majority of the respondents live in a region that is highly vulnerable to typhoons, earthquakes, volcanic eruptions, and floods. From the survey, it can be gleaned that 25 respondents (36.8%) mentioned that their experience of natural events such as earthquakes had an influence on them. One possible interpretation could be that students' personal experiences helped them in appreciating the importance of the subject especially when it tackles concepts related to what they have experienced.

Challenges and Opportunities

The respondents identified what they perceived as the challenges they encountered while taking their Earth science course through an open-ended question. Of the 68 respondents, 34 (50%) mentioned that they have had difficulties in understanding certain concepts such as differentiating rock types and their samples, imagining real-life scenarios from diagrams, and interpreting visual representations like graphs, among others. Twenty-one (30.9%) respondents considered memorization of terms and the amount of information presented were challenging while 18 (26.5%) indicated time constraints such as the number of meetings allocated for the subject per week. Moreover, 13 (19.1%) respondents said that their lack of interest in the subject or in some topics hindered their learning. Other difficulties mentioned by the respondents include the teaching styles employed in class, disruptive behavior (e.g., noisy classroom), as well as the amount of requirements in Earth science and in other subjects. Table 2 summarizes the result for this part of the survey. In a study conducted among selected staff and students from the University of Plymouth (United Kingdom), University of Colorado at Boulder (US), and the University of Calgary (Canada), King (2012) identified specific causes of difficulties in geoscience learning which include memorization, spatial literacy, issues with teachers or learners, concerns in math and science, visualization of unseen objects and abstract concepts, and understanding geologic time. Interestingly, some of the challenges noted in the present study, such as memorizing terms and visualizing abstract concepts, were similar to those identified by King (2012).

Table 2. Students' perceived challenges in Earth science

	% respondents ***n = 68***
Difficulty understanding certain topics/content	50.0
Lack of/need for more hands-on activities and materials	42.6
Memorization of terms and amount of information presented	30.9
Time constraints (e.g., number of meetings per week; study time)	26.5
Lack of interest in the subject or in certain topics	19.1
Others (e.g., teaching style, heavy workload, classroom distractions)	22.2

In addition, Kastens (2010) also mentioned some inherent hindrances to teaching the geosciences which include the reliance on models rather than real-life observation of the target phenomena. In the present study, 29 respondents (42.6%) mentioned the lack of and need for more hands-on activities and materials such as laboratory exercises and field work. Aside from observing real rock or mineral samples, other experiential activities in Earth science may include museum visits and astronomical observations (e.g., stargazing), to name a few. The integration of information and communication technologies or ICTs in the classroom has also increased in recent years. Utilization of online tools such as online simulations and interactive maps may also be explored.

Conclusion and Recommendations

This study looked into how science high school students in the Philippines perceive the value of Earth science as an academic discipline and the factors that contributed to their appreciation thereof. It also examined the common challenges encountered by the students in their Earth science class. The results suggest students' positive attitude towards Earth science. A number of motivating factors were identified such as personal motivation, good grades, influence from peers, teachers, and parents, as well as real-life experiences with Earth processes. Reported challenges include difficulties in understanding some concepts, limited hands-on exercises, memorization of terms, time constraints, and low level of interest in the subject or in certain topics.

The information presented in this research offers initial insights regarding students' attitudes toward Earth science. However, this study has its own limitations. Readers are advised to consider the results with caution given that only 68 respondents from a science high school participated in this study. Acknowledging that schools have different contexts, the present study may characterize only the respondents' experiences with Earth science but may not be representative of the whole population of students. Future researchers are encouraged to cover a wider group of students from both public and private schools. They may also explore the views and perspectives of the teachers who are assigned to teach Earth science.

Acknowledgments

The author expresses his gratitude to the student-respondents and their school administration. The insights on the initial versions of this paper by Prof. Roberto Greco, Ph.D. (Chair of the International Geoscience Education Organisation/IGEO) are much appreciated.

The author's participation and paper presentation at the APCORE Virtual Conference 2021 was funded by Xavier School Nuvali. The opinions expressed in this paper are solely of the author and do not represent the views of his institutional and organizational affiliations.

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Relationship of Mathematical Beliefs to Mathematics Performance among College Students

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Abstract - The study aimed to determine the relationship of mathematical beliefs and Mathematics performance of first year education students of Iloilo Science and Technology University - Miagao Campus for the First Semester of the Academic Year 2020-2021. A questionnaire about mathematical beliefs was administered to 193 conveniently selected students. Aspect of the questionnaire dealt with three categories which were beliefs about the nature of Mathematics, beliefs of self about Mathematics and beliefs about the value of Mathematics which all undergone a validation and a reliability test using Cronbach's Alpha. A Quantitative Research Approach with a Descriptive -Correlational Design was applied and analyses were conducted to determine the level of mathematical beliefs in each category as well as the level of their Mathematics performance when classified according to program and specialization and when taken as a whole. The correlation of Mathematics performance to those mathematical beliefs was also determined by employing a correlational analysis using Kendall's tau b. The result of the study indicates that belief about the nature of Mathematics has a significant moderate positive relationship to students' Mathematics performance and the belief about the value of Mathematics has a significant weak positive relationship to students' Mathematics performance. However, the belief of self about Mathematics was found out to have a very weak positive correlation to Mathematics performance and was not statistically significant.

Keywords - Relationship, Nature of Mathematics, Belief of self, Value of Mathematics, Mathematics performance

Introduction

Mathematics is the oldest of all sciences that have developed through the ages having a direct impact on the quality of human life on our planet. It is unanimously agreed that mathematics is the language of science and technology and also in some other disciplines like art and culture, holding the key to development and progress of the country as well as humanity as whole. Mathematics is a backbone of students to achieve and develop the skill in reasoning and thinking level. There is a general consensus among educators that mathematics is an important and useful subject for development in every country. It is the key to technology (Choudhury, R. & Das D., 2012).

However, there are data that revealed alarming facts about the Mathematics performance of students, most especially in the Philippines. PISA (Programme for International Student Assessment) 2018 results revealed that the country scored 353 in Mathematics which is the second to the lowest and is below the average among most of the countries that participated. Recently, the Department of Education stressed the dire need of addressing the issues, gaps and problems to achieve quality basic education after the Philippines got the lowest rank among 58 countries in TIMSS (Trends in International Mathematics and Science Study) 2019. The country only scored 297 in mathematics and 249 in Science, which are "significantly lower" than any other participating country.

The two parts of the individual – the affective domain and the cognitive domain are inseparable and in complex connection (Pehkonen, 1994, p. 27). Beliefs play a great role in Mathematics learning. The learning outcomes of students are strongly related to their beliefs and attitudes about Mathematics (Furinghetti & Pehkonen, 2000). Thus, assessing or evaluating of students' mathematical knowledge must be made in awareness of their beliefs (Breiteig, Grevholm & Kislenko, 2006).

In this regard, the researchers studied the relationship of mathematical beliefs and Mathematics performance of first year education students of Iloilo Science and Technology University – Miagao Campus for the First Semester of Academic Year 2020 – 2021. Specifically, this study focused on the following categories of mathematical beliefs: beliefs about the nature of Mathematics, beliefs of self about Mathematics and beliefs about the value of Mathematics.

This study was designed to answer the following research questions:

1. What is the level of the mathematical beliefs of first year education students when taken as a whole and when classified according to their program and specialization?
2. What is the level of Mathematics performance of first year education students when taken as a whole and when classified according to their program and specialization?
3. What is the relationship between the 3 categories of mathematical beliefs and Mathematics performance of first year education students?
4. Is there a significant relationship between mathematical beliefs and Mathematics performance of first year education students?

Methodology

This research study used quantitative approach with descriptive – correlational design. Quantitative research attempts to quantify, collect, analyze numerical data, and focus on the links among a smaller number of attributes across many cases (Creswell, 2013) and descriptive – correlational studies describe the variables and the relationships that occur naturally between and among them (Driesnak, Mendos, & Sousa, 2007). This quantitative approach with descriptive – correlational design focuses on gathering information about the students' mathematical beliefs and Mathematics performance as well as in determining the relationship that occurs between the two variables (mathematical beliefs and Mathematics performance).

A written permission was submitted to the Campus Administrator of Iloilo Science and Technology University – Miagao Campus for the researchers to be allowed to conduct the research study participated by first year education students who are officially enrolled for the Academic Year 2020-2021. Slovin's formula was utilized to get the sample size and the researchers have obtained 193 respondents that had been conveniently selected (25 from BEEd 1A, 23 from BEEd 1B, 25 from BSEd English, 25 from BSEd Social Studies, 24 from BSEd Science, 25 from BSEd Mathematics, 23 from BSEd Filipino and 23 from BTVTEd/BTLEd).

The instrument used was a researcher-made questionnaire. It is about the mathematical beliefs of students that are composed of 35 questions which are divided into three categories. These categories are beliefs about the nature of Mathematics which is composed of 11 questions, beliefs of self about Mathematics which is composed of 10 questions and beliefs about the value of Mathematics which is composed of 14 questions that all ranged from 'strongly agree' to 'strongly disagree'. The questionnaire has undergone a validation and a reliability test using Cronbach's Alpha. The belief about the nature of Mathematics has a reliability of 0.814; the belief of self about Mathematics has a reliability of 0.82; and the belief about the value of Mathematics has a reliability of 0.891.

The questionnaire was sent to the respondents as a Google form via Facebook or messenger. The researchers then collect and analyze the data together with their grades in Mathematics (Mathematics in the Modern World). Mean was utilized to determine the level of mathematical beliefs and Mathematics performance while Kendall's Tau-b (0.01) was used to determine the significant relationship between the two variables (mathematical beliefs and Mathematics performance).

Results and Discussions

Table 1 shows the level of belief of first year education students with regards to the nature of Mathematics. When classified according to program and specialization the mean of the strata ranges from 3.86 – 4.34 and when taken as a whole their mean is 4.07. This indicates that their level of belief is high both when classified according to program and specialization and when taken as a whole under this category.

Table 1. Level of beliefs about the nature of Mathematics

Program and Specialization	M (SD)	Description
BSEd Math	4.34 (0.40)	High
BSEd English	4.20 (0.33)	High
BSEd Science	4.20 (0.40)	High
BSEd Filipino	4.01 (0.28)	High
BSEd Social Studies	4.01 (0.42)	High
BTVTEd/BTLEd	3.98 (0.42)	High
BEEd 1A	3.89 (0.42)	High
BEEd 1B	3.86 (0.30)	High
As a Whole	**4.07 (0.40)**	**High**

Table 2 shows the level of belief of self of first year education students regarding Mathematics. When they are classified according to program and specialization most of the strata got a medium level of belief in this category and these are: BEEd 1A (M=3.54, SD=0.52), BSEd Filipino (M=3.45, SD=0.52), BSEd English (M=3.43, SD=0.55), BSEd Social Studies (M=3.39, SD=0.47), BTVTEd/ BTLEd (M=3.38, SD=0.62), and BEED 1B (M=3.28, SD=0.40). Only two have high levels which are the BSEd Math (M=3.81, SD=0.55) and BSEd Science (M=3.43, SD=0.50). When taken as a whole their mean is 3.50 which is a medium level of belief under this category.

Table 2. Level of beliefs of self about Mathematics

Program and Specialization	M (SD)	Description
BSEd Math	3.81 (0.55)	High
BSEd Science	3.68 (0.50)	High
BEEd 1A	3.54 (0.52)	Medium
BSEd Filipino	3.45 (0.52)	Medium
BSEd English	3.43 (0.55)	Medium
BSEd Social Studies	3.39 (0.47)	Medium
BTVTEd/BTLEd	3.38 (0.62)	Medium
BEEd 1B	3.28 (0.40)	Medium
As a Whole	**3.50 (0.54)**	**Medium**

Table 3 shows the level of belief of first year education students about the value of Mathematics. When classified according to program and specialization the mean of the strata ranges from 4.05 – 4.70 and when taken as a whole their mean is 4.30. This tells that their level of belief is high both when classified according to program and specialization and when taken as a whole under this category.

Table 3. Level of beliefs about the value of Mathematics

Program and Specialization	M (SD)	Description
BSEd Math	4.70 (0.33)	High
BSEd Science	4.47 (0.45)	High
BSEd Filipino	4.29 (0.42)	High
BEEd 1A	4.24 (0.44)	High
BSEd English	4.23 (0.47)	High
BSEd Social Studies	4.21 (0.53)	High
BTVTEd/BTLEd	4.21 (0.54)	High
BEEd 1B	4.05 (0.33)	High
As a Whole	**4.30 (0.48)**	**High**

Table 4 shows the mathematics performance of first year education students. When classified according to program and specialization, most of the strata got a very satisfactory level of mathematics performance, these are: BSEd Science (M=89.92, SD=0.93), BSEd Math (M=89.88, SD=0.67), BSEd Filipino (M=89.83, SD=0.78), BTVTED/BTVLED (M=88.30, SD=4.08), and BEED 1A (M=86.16, SD=1.57). Two have an excellent level of Mathematics performance which is BSEd English (M=90.32, SD=0.80) and BSEd Social Studies (M=90.16, SD=0.75). Only one has a fair level of Mathematics performance which is the BEED 1B (M=80.91, SD=6.84). When taken as a whole, their mean is 88.23 which is considered as a very satisfactory level of Mathematics performance.

Table 4. Level of Mathematics performance

Program and Specialization	M (SD)	Description
BSEd English	90.32 (0.80)	Excellent
BSEd Social Studies	90.16 (0.75)	Excellent
BSEd Science	89.92 (0.93)	Very Satisfactory
BSEd Math	89.88 (0.67)	Very Satisfactory
BSEd Filipino	89.83 (0.78)	Very Satisfactory
BTVTEd/BTLEd	88.30 (4.08)	Very Satisfactory
BEEd 1A	86.16 (1.57)	Very Satisfactory
BEEd 1B	80.91 (6.84)	Fair
As a Whole	**88.23 (4.12)**	**Very Satisfactory**

Table 5 shows that the Kendall's Tau b correlation coefficient is $\tau\_b=0.275$ for Mathematics Performance and Beliefs about Nature of Mathematics. This tells that there is a moderate positive correlation between Mathematics Performance and Beliefs about Nature of Mathematics. Regarding the Mathematics Performance and Beliefs of Self about Mathematics, the Kendall's Tau b correlation coefficient is $\tau\_b=0.070$. This tells that there is a very weak positive correlation between Math Performance and Beliefs of Self about Mathematics. While for the Mathematics Performance and Beliefs about Value of Mathematics, the Kendall's Tau b correlation coefficient is $\tau\_b=0.157$. This tells that there is a weak positive correlation between Mathematics Performance and Beliefs about the Value of Mathematics

Table 5 also shows that the p-value of the correlation between Mathematics Performance and Belief about the Nature of Mathematics is .000 which is less than the level of significance which is $\alpha=0.01$. This indicates that we reject the null hypothesis and conclude that there is a statistically significant association between the two variables Mathematics Performance and Beliefs about the Nature of Mathematic. Regarding the correlation between Mathematics performance and Beliefs of Self about Mathematics, the p-value is .193 which is greater than the level of significance which is $\alpha=0.01$. This indicates that we do not reject the null hypothesis and conclude that there is no statistically significant association between the two variables Mathematics Performance and Beliefs of Self about Mathematics. While regarding the correlation between Mathematics Performance and Belief about the Value of Mathematics, the p-value is .004 which is less than the level of significance which is $\alpha=0.01$. This indicates that we reject the null hypothesis and conclude that there is a statistically significant association between the two variables Mathematics Performance and Beliefs about Value of Mathematics.

Table 5. Correlation Between Mathematics Performance and Each Category of Beliefs about

Variables	Correlation Coefficient	Sig. (2-tailed)	Description
Mathematics Performance **Belief about the Nature of Mathematics**	.275**	.000	Moderate Positive Correlation
Mathematics Performance **Belief of Self about Mathematics**	.070	.193	Very Weak Positive Correlation
Mathematics Performance **Belief about the Value of Mathematics**	.157**	.004	Weak Positive Correlation

Conclusions and Recommendations

The results of the study revealed that when classified according to program and specialization, all of the strata got a high level of belief both about the nature and value of Mathematics. In terms of the belief of self about Mathematics most of the strata got a medium level of belief, only two have gotten a high level and they were BSEd Math and BSEd Science. On the other hand, when they are classified as a whole, first year education students got a high level of belief both about the nature and value of Mathematics, with regards to the level of belief of self about Mathematics it is considered as a medium level.

Regarding the level of Mathematics performance, when classified according to program and specialization, most of the strata got a very satisfactory level of mathematical beliefs; two got excellent levels which were the BSEd English and BSEd Social Studies, while BEEd 1B got a fair level of Mathematics performance. When taken as a whole, first year education students' level of Mathematics performance is very satisfactory.

As a whole, in terms of the significance and correlation between the variables, first year education students' belief about the nature of Mathematics and Mathematics performance has a significant moderate positive correlation. This indicates that their belief about the nature of Mathematics was related to their Mathematics performance and that as both variables (belief about the nature of Mathematics and Mathematics performance) move in the same direction, the relationship between them is neither weak nor strong but it is certainly considerable. This finding was related to Gafoor & Sarabi (2015) which agrees that one of the major categories of reason for students feeling difficulty to learn various subjects are related to the nature and characteristics of the content and method of respective subject.

The relationship between belief of self about Mathematics and Mathematics performance was not significant and has a very weak positive correlation. This indicates that their belief of self about Mathematics was not related to Mathematics performance with respect to the significance of the relationship between the variables. This shows that while both variables (belief of self about Mathematics and Mathematics performance) tend to move in the same direction, the relationship between them is too low. The study of Kunhertani & Santosa (2018) also revealed that there is no significant relationship between the two variables when they researched about the influence of students' self-confidence on Mathematics learning achievement. As disclosed by Piper, B. (2008), "It was not clear whether confidence promotes achievement or vice versa."

The belief about the value of Mathematics and Mathematics performance has a significant weak positive correlation. This indicates that their belief about the value of Mathematics was related to their Mathematics performance and that while both variables (belief about the value of Mathematics and Mathematics performance) tend to move in the same direction, the relationship between them is low. The result was related to the study of Capuno, R., et. al. (2019) where they found out that there is a significant weak positive relationship between the value of math and academic performance in math of junior high school students.

Based on the findings and conclusions, the researchers recommend the following:

1. Students are encouraged to acknowledge that their Mathematics performance might be related to their mathematical beliefs, especially about the nature and value of Mathematics. Awareness about the relationship of the mentioned variables may give them insights on how to improve their Mathematics performance.

2. Teachers are encouraged to consider each of their student's beliefs regarding the nature and value of Mathematics and adapt various teaching strategies that may help students gain a better level of belief under these categories for this could contribute to their Mathematics performance.

3. The same study is recommended to other group respondents to establish the validity of the findings and further studies related to this research using other variables are encouraged to verify other factors that relate to the Mathematics performance of the students.

Acknowledgement

The researchers would like to express their heartfelt gratitude to all the people who have contributed to the success of this research endeavor particularly to Iloilo Science and Technology University – Miagao Campus, their research adviser, panelist, professors, parents, friends and respondents of the study.

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Enhancing Learners' Mathematical Performance through Mathscore

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Abstract - This study aimed to determine the mathematical performance of 60 students who are using the conventional way of learning and using the mathscore program in Sinalhan Integrated High School for the school year 2020 – 2021. A quasi-experimental research design was applied in this study. The statistical tools used are Mean, Standard Deviation, T-test of independent and dependent samples, and Cohen's d. The results reveal that the experimental group got much higher mean scores than the comparison group on their formative and post-test. Each group shows improvement before and after the experimental study. However, the mean difference of the group that utilized the mathscore program depicts that they performed better than the comparison group, which proves that the program can help to improve the performance of the learners in terms of the lessons covered in this study. For the conclusion of this study, there is a highly significant difference between the means scores performance of the participants. Based on the findings and conclusions, the researcher suggests using the Mathscore Program as primary or secondary assistance in teaching the topics covered in this study, as it will aid in improving the learners' mathematical performance, especially those who are having difficulty with the courses and who require the administration's assistance in offering training and seminars/webinars for such a program.

Keywords - geometry, learners' mathematical performance, mathscore

Introduction

Mathematics is considered a difficult subject. Most students find mathematics hard to understand. Others may view it as a form of tedious and monotonous work. But what makes mathematics difficult? Many students struggle in mathematics like in solving problems due to numerous and complex formulas[1]. Despite these difficulties, some students find Mathematics interesting. They can figure out those mathematical problems and understand the concepts and their relationship to other fields. Mathematics has some inherent difficulties due to its abstract and cumulative nature, but how do these students overcome their challenges? Some students can solve these problems while others look for different strategies to cope with them. During the Basic Education Curriculum (BEC), in the Philippines, there are various methods in enhancing the students' mathematical skills. One of these methods is the flashcard which teachers in teaching pre-elementary students use. This method allows the students to become familiar with the basic mathematical terms. In addition to flashcards, teachers used other methods such as window cards and Sudoku challenges to further enhance their skills in Mathematics.

Moreover, in 2018, as part of the Quality Basic Education reform plan and a move toward globalizing the quality of Philippine basic education, the Philippines joined the Organization for Economic Co-operation and Development's (OECD) Program for International Student Assessment (PISA), nonetheless, according to the results of PISA released on December 3, 2018, it revealed that the Philippines has the mean score of 353 in Mathematics and ranked 77 out of 78 participating OECD countries and this result was far from its neighboured countries like China who ranked first with 591 mean score, Singapore who ranked second with 569 mean score, and Taiwan who ranked fifth with 531 mean score to the 2018 PISA.

After a poor performance in past examination, the Department of Education vowed major changes. They launched "Sulong Edukalidad," to improve the quality of basic education in the Philippines, whereby it enacted radical reforms in four key areas: (a) Upskilling teachers and school leaders through a transformed professional development program; (b) Review and updating of the curriculum; (c) Continuous improvement of the learning environment; and (d) multi-stakeholder cooperation.

In connection to the "SulongEducaklidad" program of DepEd, a new intervention in technology arises, the rapid advancement of computer and internet technologies has revolutionized how people teach and learn all over the world. Technology provides dynamic options for math instruction, enhancing the learning process and bringing concepts to life through engaging and interactive media. It may also provide additional assistance to meet the needs of all students and provide personalized learning experiences[2]. Furthermore, online web-based education provides learners with unequalled access to educational content, far outstripping the reach of traditional classrooms. It also enables open, dynamic, and distributed experiential learning, making training more engaging, participative, and efficient.

In contrast to the online web-based education, Accurate Learning Systems Corporation (ALSC), developed a web-based learning program named Mathscore, this program's aim is to: (a) improve the education of millions of kids by providing a learning environment that is superior to existing options. (b) to assist students in developing a thorough knowledge of mathematics by offering adaptive math practice that mimics self-guided lessons[3]. Likewise, it serves as a tool to engage the students to learn more about Mathematics as well as enrich their capabilities in understanding mathematical concepts and skills. The goal of the program is to: (1) establish relatable, definition-level understanding: It aids a learner in grasping the essential meaning of a concept, such as the definition of addition or the definition of a fraction, by employing pictures frequently. (2) achieve computational excellence: They efficiently build great computing capabilities by employing adaptive strategies. For example, by creatively polishing select subsets of the math facts, they are extremely effective at assisting pupils in learning their arithmetic facts. (3) Enhance analytic comprehension: the goal is to apply the concept in real-life situations [3]. This is possible after a learner has a strong understanding of definitions as well as superior computing abilities. Students will usually develop this skill by working on word problems or graphs.

The researchers have gathered evidence that Mathscore Program helps to develop the mathematical performance of the student more specially to the time of pandemic wherein no face-to-face interaction and classes were allowed and alternative delivery mode like online class was permitted by the government. The researcher conducted this study to determine the mathematical performance of students who utilized mathscore program that can help them to easily learn selected Mathematics lessons and topics. This study greatly helped the students on how they maximized the online platform and the use of Mathscore Program in enhancing and applying their mathematical skills. In addition, this study was beneficial to teachers, parents and administrator or school head as they contribute to strengthening and improving the program.
This study aimed to examine the mathematical performance of Grade 7 learners of Sinalhan Integrated High School with the application of the Mathsore program as one of the techniques and strategies in learning mathematics subject and make some recommendations to develop the mathematical skills of every student.s

Methodology

Quasi-experimental research design and the mathscore program as the main tool to gather data needed in this study. This design is to establish causality or the effect of an independent variable on the dependent variable [4]. However, quasi-experimental studies are helpful since they assess the effectiveness of treatment. The sixty (60) Grade VII learners were the participants of this study which came from seven sections consist of 340 learners.

The researcher gave 50-item standardized pretest to the Grade VII learners from Section A to Section G and were paired accordingly through comparing their scores. Pretest was used to identify the members of the groups. The researcher used matched pair analysis.

Table 1. presented the learning competencies covered in the pretest.

Table 1. Learning Competencies in the Third Quarter Period

Learning Competencies
Lesson 1: illustrates subsets of a line
Lesson 2: classifies the different kinds of angles
Lesson 3: derives relationships of geometric figures using measurements and by inductive reasoning; supplementary angles, complementary angles, congruent angles, vertical angles, adjacent angles, linear pairs, perpendicular lines, and parallel lines;
Lesson 4: derives relationships among angles formed by parallel lines cut by a transversal using measurement and by inductive reasoning;
Lesson 5: uses a compass and straightedge to bisect line segments and angles and construct perpendiculars and parallels;
Lesson 6: illustrates polygons: (a) convexity; (b) angles; and (c) sides
Lesson 7: derives inductively the relationship of exterior and interior angles of a convex polygon;
Lesson 8: illustrates a circle and the terms related to it: radius, diameter chord, center, arc, chord, central angle, and inscribed angle;
Lesson 9: constructs triangles, squares, rectangles, regular pentagons, and regular hexagons;
Lesson 10: solves problems involving sides and angles of a polygon

Table 2 presented the pretest mean scores of Grade VII learners in Geometry.

Table 2. Experimental and Comparison Groups Mean Pretest Scores

Group	Mean	SD	Descriptive Interpretation
Experimental	21.00	8.69	B
Comparison	21.00	8.69	B

Legend: 40.00- 50.00 or 90-100% Advanced (A); 35.00-39.00 or 85-89% Proficient (P); 30.00 -34.00 or 80-84% Approaching Proficiency (AP) 25.00-29.00 or 75-79% Developing (D); and 24.00 or 74% & below Beginning (B)

The table revealed the result of the given pretest which was also used as basis in match pairing of the two groups of participants. As a result, the pairs of Grade VII learners were included in comparison and experimental groups. Both groups of participants garnered a mean score of 17.71 and standard deviation of 5.68 were obtained by both groups. It showed that the individual score obtained by learners included in the experimental and control groups were in the beginning level before the experimental study. On the other hand, mean of standard deviation was used to determine the performance of both groups of participants in pre-test, formative test, and post-test. In addition, independent sample t-test was used to determine the level of significance difference between formative, post-test, and summative mean scores of the learners of the experimental group and comparison group. Moreover, paired t-test analysis was used to determine the significant difference between the pre-test and post-test mean scores of the learners both in the experimental group and comparison group. Furthermore, Cohen’s D effect size was used to indicate the standardized difference between two means, it was an appropriate effect size for the comparison between the experimental group and comparison group.

Results and Discussions

Table 3 presented the mean scores of the experimental and comparison groups on their formative tests.

Table 3. Performance of the Experimental and Comparison Groups on Formative Test Mean Scores

Learning Competencies		Mean	SD	DI
Lesson 1	Experimental	4.60	0.56	A
	Comparison	2.47	0.73	D
Lesson 2	Experimental	4.50	0.51	A
	Comparison	3.13	1.04	AP
Lesson 3	Experimental	3.77	0.90	P
	Comparison	2.07	0.91	D
Lesson 4	Experimental	4.00	0.69	P
	Comparison	2.37	1.03	D
Lesson 5	Experimental	4.13	0.63	P
	Comparison	2.53	1.11	AP
Lesson 6	Experimental	4.07	0.69	P
	Comparison	2.53	1.25	AP
Lesson 7	Experimental	4.10	0.88	P
	Comparison	2.47	1.25	D
Lesson 8	Experimental	4.57	0.63	A
	Comparison	2.43	0.97	D
Lesson 9	Experimental	3.83	0.87	P
	Comparison	2.97	0.89	AP
Lesson 10	Experimental	3.47	0.94	AP
	Comparison	1.97	0.96	D

Legend: 4.50- 10.00 or 90-100% Advanced (A); 3.50-4.49 or 85-89% Proficient (P); 2.50 -3.49 or 80-84% Approaching Proficiency (AP) 1.50-2.49 or 75-79% Developing (D); and 1.00 or 74% & below Beginning (B)

The results revealed that mean scores in formative test performance of the experimental group for Lesson 1: illustrates subsets of a line has a mean of 4.60 and SD = 0.56 describes as advanced while the comparison group was developing with a mean of 2.47 and SD = 0.73. In Lesson 2: classifies the different kinds of angles, the experimental group is advanced in this lesson with a mean score of 4.50 with SD = 0.51 while the comparison group was approaching proficiency with a mean of 3.13 and SD = 1.04. In Lesson 3: derives relationships of geometric figures using measurements and by inductive reasoning; supplementary angles, complementary angles, congruent angles, vertical angles, adjacent angles, linear pairs, perpendicular lines, and parallel lines, the experimental group was proficient in this lesson with a mean score of 3.77 and SD = 0.90, while the comparison group was developing with a mean of 2.07 and SD = 0.91.

Moreover, the experimental group was advanced with a mean score of 4.00 and SD = 0.69 while the comparison group was developing with a mean of 2.37 and SD = 1.03 in Lesson 4: derives relationships among angles formed by parallel lines cut by a transversal using measurement and by inductive reasoning; while in Lesson 5: uses a compass and straightedge to bisect line segments and angles and construct perpendiculars and parallels, the experimental group was proficient in this lesson with a mean score of 4.14 and SD = 0.63 while the comparison group was approaching proficiency with a mean of 2.53 and SD = 1.11. In Lesson 6: illustrates polygons: (a) convexity; (b) angles; and (c) sides, the experimental is proficient in this lesson with a mean score of 4.07 and SD = 0.69 while the comparison group was approaching proficiency with a mean of 2.53 and SD = 1.25, for Lesson 7: derives inductively the relationship of exterior and interior angles of a convex polygon, it described that the experimental group was proficient with a mean

of 4.10 and SD = 0.88 while developing for the comparison group with a mean of 2.47 and SD = 1.45 ,and in Lesson 8: illustrates a circle and the terms related to it: radius, diameter chord, center, arc, chord, central angle, and inscribed angle, the experimental group was advanced with a mean of 4.57 and SD= 0.63 and developing for the comparison group with a mean of 2.43 and SD = 0.97. Likewise, in Lesson 9: constructs triangles, squares, rectangles, regular pentagons, and regular hexagons, the experimental group is proficient with a mean of 3.83 and SD = 0.87, while comparison group was approaching proficiency with a mean of 2.97 and SD = 0.89, and in Lesson 10: solves problems involving sides and angles of a polygon, experimental group has a mean of 3.47 and SD = 0.94 describe as approaching proficiency while comparison group was developing with a mean of 1.97 and SD = 0.96.
The overall mean of 4.10 for the experimental group which described as Proficient while comparison group which described as developing with an overall mean of 2.49 that shows that the participants that utilized the Mathscore Program performed better than the participants who used the conventional materials.

Table 4, depicted the test of significant difference between the mean scores' performance of the experimental and comparison groups on their formative test.

Table 4. Significant Differences in Performance Between Experimental and Comparison Groups' Formative Test Mean Scores

Learning Competencies		Mean	Mean Difference	t-value
Lesson 1	Experimental	4.60	2.13	12.6696**
	Comparison	2.47		
Lesson 2	Experimental	4.50	1.37	6.4577**
	Comparison	3.13		
Lesson 3	Experimental	3.77	1.70	7.2960**
	Comparison	2.07		
Lesson 4	Experimental	4.00	1.63	7.1844**
	Comparison	2.37		
Lesson 5	Experimental	4.13	1.60	6.8887**
	Comparison	2.53		
Lesson 6	Experimental	4.07	1.53	5.8715**
	Comparison	2.53		
Lesson 7	Experimental	4.10	1.63	5.8351**
	Comparison	2.47		
Lesson 8	Experimental	4.57	2.13	10.111**
	Comparison	2.43		
Lesson 9:	Experimental	3.83	0.87	3.8051**
	Comparison	2.97		
Lesson 10	Experimental	3.47	1.50	6.1101**
	Comparison	1.97		

Legend: df = Degrees of Freedom
***Highly Significant at .05 level*

In viewing this result, it can be stated that the formative score of the experimental group was much higher than the comparison group due to the Mathscore program that the experimental group had been utilized. However, the result revealed the influence that constructivism of Piaget and technology were working together today. With the concept of constructivism, the facilitator in this situation must guarantee that the student comes to their conclusions rather than being lectured with the help and integration of educational technology [5]. Moreover, Piaget also claimed that with technology, it helps the teachers and students in teaching-learning process. Besides in Mathscore program, facilitator focuses on the process of learning and the outcomes that were produced. The teacher gave many opportunities to express understanding, as a primary goal in constructing knowledge was the application of the learning in an immediate and meaningful way.

Table 5 showed the mean scores of experimental and comparison groups on their posttest.

Table 5. Experimental and Comparison Group Mean Posttest Scores

Group	Mean	SD	DI
Experimental	32.23	6.12	P
Comparison	21.87	7.15	B

Legend: 40.00- 50.00 or 90-100% Advanced (A); 35.00-39.00 or 85-89% Proficient (P); 30.00 -34.00 or 80-84% Approaching Proficiency (AP) 25.00-29.00 or 75-79% Developing (D); and 24.00 or 74% & below Beginning (B)

The posttest mean scores of 32.23 (SD= 6.12) which was proficient in the experimental group was much higher than comparison group with mean scores of 21.60 (SD= 7.23) which was in the beginning level.
Table 5 revealed the test of significant difference between the mean score's performance of the experimental and comparison groups in their posttest.

Table 6. Test of Significant Difference between the Posttest Mean Scores of

Group	Mean	Mean Difference	df	*t-value*	Cohen's D	Effect Size
Experimental	32.23	10.37	57	6.0330**	1.5577	Large
Comparison	21.87					

Legend: df = Degrees of Freedom
***Highly Significant at .05 level*

The results showed that the posttest mean difference of the experimental and comparison group was 10.37. It showed that the experimental group who utilized Mathscore program performed well in their posttest.

Table 7. presented the test of significant difference between the pretest and posttest mean scores of each group.

Table 7. Test of significant difference between the pretest and posttest mean scores of each group.

Group	Test	Mean	Mean Difference	Df	t-value	Cohen's D
Experimental	Pretest	21	11.23	52	5.7894**	1.4948
	Posttest	32.23				
Comparison	Pretest	21	0.87	56	0.4218**	0.1089
	Posttest	21.87				

Cohen's d: 0.20 (Small); 0.50 (Medium); 0.80 (Large)
***Highly Significant at .05 level*

The result revealed that there were highly significant differences between the posttest and pretest mean scores of each groups of participants, for the experimental group with computed t-value of 5.7894 with Cohen's d of 1.4948 with large effect size while comparison group has 0.4218 and Cohen's d of 0.1089 a small effect size, also, both with p-values of less than 0.05 level of significance which indicated that experimental group improved their performance after the experimental process, hence the result shows that the experimental group has a higher mean difference of 11.23 compare to comparison group with a mean difference of 0.87. It also showed that the experimental group who utilized Mathscore program performed well in their lessons, and Mathscore as web-based program in online learning helps them to understand their lessons very well.

Conclusion and Recommendations

The researchers concluded that the findings showed that there was significant difference between the experimental group's pretest and posttest mean scores performance of the Grade 7 learners; nevertheless, these results described that though the participants using K-12 materials helped in improving their mean scores performance, the participants who used the Mathscore Program got higher mean scores performance.

On the other hand, based on the results of this study, the researchers recommended that the parents as one of the stakeholders, may take a close watch at their children in using Mathscore and may support them in all of the needs of the program such as time, performance, and technology-based needs to achieve success of the program. They also recommended that the teachers may keep track of the students' progression in using Mathscore program to continuously diagnose the mathematical skills and performance of the students alongside the improvement of the program and therefore accommodate those needs within the classroom. In addition, they are also encouraged to utilize Mathscore program as one of the references in teaching mathematics in the 21st century learners and suggested to be used as supplementary materials in teaching the lessons covered in this study for it will help on the improvement of the learners' performance especially those having difficulties with the said lessons. Moreover, the School Head and Administration may support and provide the technological requirements of such program to improve students' learning. Likewise, researchers may explore more about Mathscore program and may use this study as one of the references in conducting more studies related to the program. In addition, this can be an edge to new researchers in verifying existing knowledge.

Acknowledgment

The researcher would like to extend her deepest appreciation to the following for the completion of this study.

The Lord Almighty for the provision of knowledge, strength, perseverance, and determination, with Him, the completion of this study come into reality;

Dr. Mario R. Briones, president of LSPU System for his continual support to the students of Laguna State Polytechnic University;

Mr. Joel M. Bawica, Campus Director, for his professional guidance in giving the researcher a sense of purpose and direction in achieving this professional growth;

Dr. Karen A. Manaig, Associate Dean of College of Teacher Education, whose patience, expertise gave much inspiration to the researcher, and for her guidance and understanding and for their suggestions and advice as one of the Panel of examiners;

Dr. Alberto D. Yazon, Program Coordinator of Graduate Studies and Applied Research, one of Panel of Examiners, for his guidance and understanding and for their suggestions and advice;

Dr. Victoria E. Tamban, her thesis adviser, for her dedication, patience, sincere concern, and good will in giving her utmost support throughout the completion of this work;

Dr. Sherwin B. Sapin, Panel of Examiner, for their guidance and understanding and for their suggestions and advice;

Mrs. Ma. Cristina C. Pegollo, his principal, for her understanding, and graciousness in allowing this study to continue and see its completion;

Mrs. Marilou Nigos, Grade 7 Key Teacher, for the encouragement, generous help, assistance, cooperation, and inspiration to push through and eventually see this study into completion;

To all the Grade 7 students of Sinalhan Integrated High School (Batch 2020-2021) who served as the participants of the study, without their willingness and cooperation in this study would not have materialized;

To all his friends most specially SUSI Choir Family, for their prayers and moral support;
His entire family especially his parents Daniel B. Cerbito and Jocelyn S. Cerbito, his brothers Jheno, Jimwell, Sherwin and Janry Cerbito for the endless love and support;

To his loved-one, Mynjeal V. Mirafuentes, for the love, inspiration, and support morally and financially.

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Gender and Development Integration in the Curriculum of State Universities in Region-X

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Abstract - The education sector has long been identified by the United Nations in their crucial role in achieving gender equality through gender mainstreaming. The study aimed to describe how gender and development is integrated in the curriculum in the state universities in Northern Mindanao. A multiple case study with embedded design was used in the research. Included in the study were four (4) state universities in Region X. The study identified the modes of gender mainstreaming in the curriculum. Gender mainstreaming in the curriculum was traced in the subjects offered in the various curricular programs of the state universities. The study also identified the various curricular activities conducted by the state universities relevant to gender and development. Gender fair language was used in the instructional materials. It is recommended that intensive gender mainstreaming in the curriculum of the state universities be implemented by identifying the programs, subjects, topics, activities, strategies, and other relevant activities that will promote gender equality among its stakeholders. Full implementation of the CHED Memorandum Order 01 series 2015 on the development of a standard manual for a gender-responsive curriculum. Monitoring and evaluation of gender and development programs implemented by state universities by concerned agencies.

Keywords - Gender Mainstreaming, GAD Integration in the Curriculum, Gender-Responsive Curriculum

Introduction

In 2017, the National Demographic and Health Survey of the Philippine Statistics Authority reported that one (1) in four (4) or 11, 558 ever-married women aged 15-49 have experienced physical, sexual, or emotional violence by their husband or partner (PSA, 2018; PCW, 2018). Globally, as many as 82 % of female parliamentarians in a study in 39 countries, reported having experienced some form of threats, mobbing, remarks, gestures, and images of a sexist or humiliating sexual nature against them (Okenwa-Emgwa & Strauss,2018, para. 3).

Despite the numerous laws protecting women and girls, campaigns and programs of the government to strengthen the call to end the phenomenon Bernarte, Acedegbega, Fadera, & Yopyop (2018), cases of domestic violence remain high (Digal, 2018, para 4), and is forecasted to be increasing in the next ten (10) years (Deguma, Peteros, Case, and Igot, 2018, p.72). However, the graphical showcase of figures of women's advancement in politics, academic and professional excellence, and even in legislation (Sumadsad and Tuazon, 2016, p.76), seem to be ironic with the observed gender situation and how women and the LGBTs are being treated in the country today. The Philippines, as reported by Mercurio (2015), has been consistent in making it to the top ten global ranking in the Global Gender Gap Index of the annual World Economic Forum since 2006, the only Asian country to make it in the top ten, (World Bank, 2017). It is contrasted by images of prostituted women, battered wives, economically disadvantaged women, exploited migrant workers, abuses on children, minors, and LGBT, stereotyping, discrimination, and cases of sexual harassment. The initiatives of the Philippines to combat any form of abuses and violence against women started in the 1980s, when the country became a State Party to the United Nations (UN) Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW), and which had been complemented by the Beijing Platform for Action (BPFA) in 1995. The Philippines pursue and implement programs, projects and activities that contribute to the achievement of women's empowerment and gender equality, (CHED, 2015, p.1).

Concerned government agencies like the Philippine Commission on Women (PCW), Commission on Higher Education (CHED), State Universities and Colleges (SUCs), among others, nonetheless continue to pursue gender mainstreaming. The higher education institutions (HEIs), being one of the responsible agencies to implement and institutionalize GAD required policies, standards and guidelines like the Magna Carta of Women (MCW) or Republic Act 9710 have not been excluded from these efforts.

However, it was observed that gender mainstreaming in SUs in Region 10 were “inconsistent and not gender-responsive” as indicated by the “off and on compliance” of submission of GAD Plans and Budget, according to CHED-RO10 Focal Person. She added, that “the SUCs annually prepare GAD Plans and Budget as a requirement, but most have failed in the process required in addressing gender issues and real life issues among its stakeholders.” Furthermore, GAD activities and programs were regularly conducted in SUCs but the question was how the programs and activities were being designed, such that they would be responsive to specific gender issues. Further, the Focal Person lamented the fact that performance outcomes of the programs and activities conducted were not reported clearly neither indicating results, nor the effect or the change it had made to the beneficiaries. Instead, it focused only on figures, numbers, frequency of activities conducted and clients who participated.

The UN recognized the crucial role of the education systems and all elements of these systems (teachers, schools, textbooks, research institutes and so on) to empower both the girls and boys, and to take care in counterbalancing the existing gender hierarchies (Council of Europe, 1998). The higher education has long been identified as an important arena for addressing the problem and addressing gender equality (Okenwa-Emgwa and Strauss, 2018; Magi, Biin, Frasberg, and Kruus, 2016, p.191). It is the “threshold where the future decision makers and policy makers receive training and are exposed to principles, a key tenets of development” (Turmaine, 2009, as cited by Singh and Varma, 2016, p.1). For the state universities and colleges (SUCs) that are being counted upon by the national government to implement gender mainstreaming, the big question is on what and how far they have gone in their implementation. It is timely therefore, to conduct an assessment among the state universities in their efforts in promoting gender equality. The education section sector holds a powerful position among other social institutions, being the central site for transferring and consolidation of norms, skills, knowledge in societies, and in empowering the next generation (Magi, et.al, 2016, p.191).

Methodology

The study utilized a multiple case embedded research design. Multiple case study method was employed because the study on gender mainstreaming involved four (4) state universities, which was “considered comparative (or multiple case studies)” (Eckstein, 1975, p.18; Lijphart, 1975, p.160). Yin (2017), indicated that the use of multiple case design in qualitative research and use of the cross-case synthesis techniques in analyzing qualitative data are preferred methods for strengthening validity and robustness in qualitative research. The embedded design of the study implied that the data and information were sourced and gathered from different sources. Documentary analysis of GAD plans and reports, policy verification, interviews, and observations were used to confirm information and data gathered. The status of gender and development integration in the curriculum of the SUs were described according to the competency standards of CMO 01 Series of 2015. Thus, the status of GAD integration in the instruction determined the gender responsiveness of the SUs. Interviews and documentary analyses were supported in the results of the study.

The study covered only four (4) state universities (SUs) in Region X, whose GAD Plan and Budget were monitored and endorsed by the GAD Focal Person of CHED RO – 10 to the Philippine Commission on Women (PCW). The SUs included Central Mindanao University (CMU) in Musuan, Maramag, Bukidnon; Bukidnon State University (BukSU) in Malaybalay City, Bukidnon; University of Science and Technology in Southern Philippines (USTP) in Cagayan de Oro City and, Mindanao State University – Iligan Institute of Technology (MSU-IIT) in Iligan City. The participants of the study include the members of the GAD Focal Point System, GAD- Technical Working Group, representatives from the faculty, personnel and student officers.

Information gathered from interviews and documents were further verified with other stakeholders like students, faculty, and staff. The findings of the study were discussed with the GAD Focal Person, and or the GAD Focal System to validate the findings. Further, the findings of the study were also presented and discussed with the CHED-RO10 GAD Focal Person, who monitored and supervised the gender mainstreaming of the SUs in the region. Thematic analysis was used in the data analysis and interpretations.

Results and Discussions

GAD integration in the subjects

The state universities in Region X complied with the mandate of CMO 13 Series of 2013, offering Gender and Society subject in all their curricular programs. Aside from that, “Understanding the Self” was also offered as a subject in the general education curriculum in all programs, which also had topics about gender identity, sexual orientation, and the like. Gender and development module was also included in the National Service Training Program (NSTP). Basic GAD orientation was also incorporated in the annual college orientation in the SUs, and other pertinent laws like the Anti-Sexual Harassment Law, Violence-Against Women and Children, Anti-Trafficking Law, and others. The SUs in Region X evidently integrated GAD in the instruction and complied with the GAD advocacy of the government. This mechanism conformed to the call of the United Nations on gender equality, recognizing the crucial role of education in shaping gender representations, attitudes and behaviors and in making sure that the education system promotes real equality between women and men (Council of Europe, 2017, p.5).

Modes of GAD integration used SU A

It was worth noting how State University A integrated gender and development in the curriculum. There were two (2) modes used in the integration. One was by the faculty member’s initiative on incorporating the perspective resultant to valuing its relevance to the subject matter and by incorporating a specific subject on Gender and Development designed for the major students, as in the case of AB Political Science (Pol Sci 156 – Gender, Peace-building and Development) and AB Sociology (Socio 148 – Gender and Development). The following were indicated: Socio 112 – Gender and Development (Department of Sociology – Fourth Year, First Semester); Pol Sci 156 (Elec) – Gender, Peace and Development (Department of Political Science – Third Year, Second Semester); GEE 102 – Gender and Society (Department of Hotel and Restaurant Management, College of Business Administration and Accountancy - Second Year, First Semester); NCM 101 – Care of Mother, Child and Family (College of Nursing – Second Year, First Semester); Ed 121 – Social Dimensions of Education (GAD is incorporated) College of Education – First Year, Second Semester; SDS 254 – Gender and Development (School of Graduate Studies – Master in Sustainable and Development Studies); and National Service Training Program (NSTP) Module #8 – Gender and Development. The apparent inclusion of gender and development in the curriculum also hold true with other higher education institutions such as Miriam College, St. Scholastica’s College, Philippine Normal University, (Bucoy, 2017), and with the University of Southern Philippines, (Villaroman, 2017).

The findings of the study manifested the commitment of the people involved in integrating GAD in the instruction. It signified the depth of understanding and sensitivity among the faculty members and the whole system of GAD in the institution. Therefore, GAD integration in the instruction of SU A is gender responsive and is worthy of commendation.

GAD – responsive instructional materials

Two (2) of the State Universities, B and C, had reviewed and revised their instructional materials to free these from stereotypes, gender biases, and ensuring the use of gender sensitive language. However, review and revisions of the instructional materials for other subjects were ongoing. The instructional materials revision committee was tasked to do the review and revisions. It was presented for approval to the academic council, to be reviewed further by the publication committee in compliance with the publication policies, and finally to be approved by the Board of Regents.

State University C had conducted a seminar workshop on “Gender-Fair Language” in October 2019. According to the GAD Focal Person, the seminar-workshop will then be the start of the review and revisions of their instructional materials. The “use of gender-fair language are (sic) affirmative actions to remove bias from curricula and teaching materials” (Licuanan, 2016, p.18). Increasing gender awareness includes mechanisms for GAD promotion and communication in messages and information, (Sumadsad, et.al, 2016, p.84).

GAD – responsive services and programs

The provisions of the equal opportunity principles, anti-discrimination policies, and the recognition of the rights of students/employees in the university code, student handbook, manuals, and human resource management handbook propelled the confidence, security, and empowerment among the members of the academic community. According to the student services department of the SUs, aside from the regular services offered like medical, dental, admission/entrance examination, counselling, and others, they also provided awareness and lectures about sexual harassment, personal and professional development, coping college life, HIV awareness, and other issues identified as a result of their assessment conducted at the start of the academic year. Some professors and counsellors claimed that gender awareness among students and employees were high and it is a shared culture in the university. Students, in an interview revealed that it was empowering for them knowing that there were policies and laws providing for their security in the campus. The student leaders expressed their confidence in helping and promoting gender awareness and policies, promoting and protecting the rights of other students, and opening doors for assistance and services. There were no incidence nor issues on discrimination against women and the LGBTQ reported in the SUs in Region X.

The LGBTQ community was not organized. A counsellor stated that their academic community is conservative, that the members of the LGBTQ are not that expressive in their identities with regards to cross dressing, wearing of make - up and other “girly or kikay” thing. The Director of the Student Affairs in State University C expressed her desire to organize the LGBTQ in the university, in order to address specific issues and concerns for them. Other PAPs that promoted gender in the curriculum include activities integrated in the subjects, in college, and in the university-wide programs like essay-writing contests, poster making, theatre performance and workshops, debate, photography, forum and lectures, and community outreach programs participated in by students. GAD integration in the curriculum of the state universities in Region X was evident in the offering of the subject – Gender and Society, Understanding the Self, and the GAD Orientation/Gender Sensitivity Training in the NSTP module.

Other SUs identified specific subjects and topics in their programs integrating gender perspective. Various activities were also conducted promoting gender awareness, human rights, and other relevant and timely topics. The emphasis of GAD integration in the tri-logical functions of the state universities is illustrative of the restructuring of systems, modification of educational landscape, social and cultural patterns of behavior, gender perspective in the economic, social, cultural, and political programs of the government. The institutionalization of gender-neutral policies and the equal opportunities provisions that allow women to reach their fullest potentials were also manifested in the GAD integration. All these displayed the interplay of Liberal, Cultural and Dominance Feminisms, and adhered to the UN CEDAW.

Conclusion and Recommendations

GAD integration in the curriculum was traced in the subjects offered, Gender and Society and Understanding the Self, and in the NSTP program. Gender and Society was offered as mandatory elective in the state universities in Region X. Other subjects were identified in the arts and sciences that incorporated GAD – related topics. Gender fair language was used in the instructional materials as well as in the forms of communication.

GAD integration in instruction of the state universities is compliant with the requirements of memorandum orders on gender mainstreaming in schools. Gender mainstreaming also results to positive outcomes among stakeholders and affirms the ideals of women empowerment.

Recommendations

1. Implement intensive GAD integration in the curriculum in all programs of the state universities by identifying subjects and topics, strategies, and activities that will promote gender awareness, human rights, equality, and understanding among students.

2. Fully implement CMO # 01 Series of 2015, particularly the development of a standard manual (Par V, Rule III, Section 9) for the gender responsive curriculum, research and extension programs of HEIs and by monitoring and evaluation of the Technical Panel on Gender and Women Studies (TPGWS) (Part V, Rule III, Section 8).

Acknowledgement

It is with immense gratitude that the researcher would like to acknowledge the following people who, in one way or another, have extended support and assistance in the completion of this paper.

The Commission on Higher Education (CHED) Graduate Studies – Local for the scholarship grant and the opportunity accorded.

To Camiguin Polytechnic State College for the motivation & warmest support extended.

To Father Saturnino Urios University Graduate Studies for their guidance and excellence in molding students for academic achievements.

To all who in one way or another had contributed to the success of this endeavor, my sincere gratitude!

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The Role of Education and Research Amidst the Challenges in the Post Pandemic World

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Abstract - The worldwide pandemic phenomenon is synonymous with the phenomenon of accelerating multidimensional interdependence affecting all spheres wherein the education paradigm failed to adjust. The once monopolistic control of the state over the educational process was irremediably weakened by worldwide death scare (covid 19 and variants) and a proliferation of international, community-based, industry-provided, and private educational venues, as demand for education spaces accelerated faster than government budgets could provide. The emergence of these new roles and accountabilities of offering service to society, the inherent compulsions between serving as a handmaiden of government vs. serving as a social critic and serving as a collective and heterogeneous set of social consciences, being a predictor of and precipitator of social and scientific transition is changing how universities view themselves, seek resources, and respond to social signals to align their actions with perceived social necessities stemming to an evolution of new modalities to address. Universities now conduct their endeavor in new ways. This transforms the demand and access calculus of higher education. This is realized in closer collaboration with other sectors of society and cross-border education represented by the exchange of students and faculty and the creation of new networks, partnerships consortia, and forms of the association currently being invented and defined. The information-sharing has enabled a redefinition of communities of research and inquiry. The outcome is a global education community making this task of cultural and language preservation by universities vital.

Keywords - postmodern, globalization, communication, institution, education

Introduction

The worldwide pandemic phenomenon is synonymous to the phenomenon of accelerating multidimensional interdependence, not just among nations but also within diverging scales of community, from regional alliances, to ethnic and religious groups, to families themselves. This interdependence permeates all spheres – political, economic, socio-cultural. The once monopolistic control of the state over the educational process was irremediably weakened by worldwide death scare (covid 19 and variants) and a proliferation of international, community-based, industry-provided, and private educational venues, as demand for education spaces accelerated faster than government budgets could provide. This post pandemic setting affected all spheres wherein the education paradigm failed to adjust. The challenge is to revitalize that this momentum transport us not to injustice, exploitations, intolerance, or violence but to mutual respect, understanding, and the benefit of all concerned. Today, universities no longer have the monopoly or even the dominant role in today's knowledge society. The world bank affirmed: “Knowledge itself is the most powerful driver of social and economic progress in the world today.” Knowledge is everywhere. It is transmitted at speeds, quantities, and modalities unimaginable twenty or ten years ago. In the old days, the seeker of knowledge would go to the universities and their great libraries, now where do they go? To Google, to Wikepedia. For specific information, one no longer consider bibliographies or catalogues, one merely see the e-mail of the specific expert or source.

A knowledge society is a society of lifelong learning, and with a variation. The term extended to configure a measure of retraining (retooling) individuals in the workforce shifting along the cycle of restructured jobs. We can visualize it now as a requirement of currency, that which is required to be professionally responsible to one's knowledge obligations. This sense of the changed nature of lifelong learning will radically further transform the demand and access calculus of higher education. What is now optional will become required. The issues on politics and economies of higher education in the emergent knowledge society must be addressed:

First, the transmutation of the "digital divide" problem. It alluded to the gap between those with computing competence and those without. A number of organizations throughout the world have endeavored to bring capacity and capability to places where it was formerly lacking. Today, we are faced with the boundary-destroying nature of digital proliferation. Universities themselves are in danger of being hierarchically divided by their abilities to keep abreast of these developments. They represent a quantum leap change in the demands and requirements of addressing the digital divide.
Second, the contention of value within information. The changing economic dynamics of information and knowledge companies and the extraordinary growth of their products generate an "informational field" of an extent and density never before experienced. In the midst of this explosive blizzard of information lie those coherence engendering devices and process we label "search." Determining the pathways and value-ways through this information blizzard toward knowledge coherence constitutes a problem of unprecedented proportions for higher education grasped as collections of knowledge organizations. The magnitude of new resources demanded by such institutions to successfully navigate these transformations will be enormous. Public policy must be fully implicated in offering the capacity to deal with these transitions, or public institutions at the very least will fail to address this challenge.
Lastly, the contention of what knowledge to conserve in a world that is being rapidly globalized. Two historic functions of universities – teaching and research. What to teach is an increasingly pressing dilemma, one for which universities are particularly ill-equipped to deal with, given their historically conservative discretion making traditions. And with research contentions, we face the prospect of extending to cultures problem to the whole of global education. The instrumental value of science and technology and its imperative alignment with economic development threaten to displace the study of humanities, and to some extent the social sciences, within university priorities.

Methodology

A qualitative case study methodology was used in this research. The research was conducted via google classroom to selected 15 Graduate School students at Aklan State University. For further clarification, the researcher also used interview as a method to collect information (Smith, Thorpe & Lowe, 1997). Interviews lasting for about 60 to 90 minutes were conducted.

Results and Discussions

Paradigms for Development

Education paradigms were generated in the past by the political, economic, and social world it operated in: the stemming of the nation-state required a common national experience and institution that could generate an aspect of national identity and unity, the industrial workplace preferred a trained and specialized skilled workforce, and the social institutions of family, church, and community demanded a structure and venue for generating of their values and common understandings.

Today, there is a gap between education and peaceful and sustainable development. There is the economic dimension wherein the human race cannot equitably develop or long survive if greed envelopes the rich grow richer and the poor grow poorer. There is the sociocultural dimension wherein development cannot be sustained if a culture of war, intolerance and violence prevails, where men and ethnic and other groups hate and kill each other, building nuclear capabilities that threaten the very survival of this planet. Why has education not succeeded in instilling a culture of peace, conflict resolution, using reason and respect instead of bombs, guns and knives as the weapons for handling differences? Illiteracy engenders the same outcome. It is known as blind obedience. It is because they are shut off from the rest of the world and know and follow only what their master orders them.

By contrast and implication, the role of education in engendering a culture of tolerance, understanding, and henceforth, peace must be the threshold with the conduct of the teacher in the classroom and the atmosphere of openness in the school. A harmonious reaching faculty serves as a model for how divergences can be worked out. The engagement between administrators and faculty is not lost on the student. Globalization has at once brought the world concatenated together, with common products, common lifestyles, instant communication and homogeneity. But it has also torn the world apart. It has polarized those precisely threatened by this homogeneity. They are fearful that this would overwhelm their own local and even tribal identities, cultures, and traditional avenues of life. The outcome is a fierce resistance to the globalization brought about by the big Western globalizers to the extent of war and violence, which only harvests a responding violence from the other side. In addition, the post pandemic world embarking universities to greater challenges. Education is visualized as the escape from this vicious cycle. Unesco's preamble reminds us that: "Since war is made in the minds of men, it must be in the minds of men that the defenses of peace must be built. A secure and lasting peace is not achieved by treaties, negotiating panels, or arms control, but by the intellectual and moral solidarity of mankind.

First, paradigms for development – time flies, the world is in a flux of transition. It has shifted dramatically and quickly that we can no longer assume that what worked before works today. This is true not only with regard to universities, or to basic education, but to every modality of life, from the manner we work and play, to the manner we acquire and transmit information, to the manner we resolve ethnic compulsions, to the aspect we administer justice, to the sphere we govern states. In this post pandemic world, universities no longer have the monopoly or even the dominant role in today's knowledge society. The post industrial workforce became less hierarchical, specialized, and rigid, demanding ever-new innovations and sets of skills that the education sector was never substantially ready to provide. The former anchoring influences of church and extended family ties have been weakened by a fast incrementing secular society and nuclear, often working-parent or single-parent families. It was further weakened by covid 19 virus and variants death scare. If development could not be sustained, the planet would not survive as we ravage its resources with greenhouse gas emissions, pollution, global warming, etc.. So, the threats to the survival of this planet are also in the economic, social and cultural spheres. In this context, universities have a specific role: to marshall their efforts and resources to reverse those alarming unhealthy trends of a neoliberal consumerist and greed-based society.

Second, the possibilities for development – bringing education for sustainable development into the mainstream of university life. Here, innovation is essential as a concession to the indispensability of education for sustainable development.

Third, partnerships for development – the tasks of sustainable development transcends the task of universities. Psartnerships and participation are inevitable. In a globalized society, such partnerships have to be both local and international.

Fourth, fostering development – here, there is a transition from the conceptual to the practical. Academics have a sometimes undeserved reputation of being more interested in understanding a problem than in solving it. Quality assurance is pivotal. Evaluation and assessment are evolving sciences and encounter difficulty when attempting to address the question of standards. The problem is even more difficult when measuring effectiveness of paradigmatic change or behavior modification. But it must be undertaken. Aside from providing a benchmark, it is also, especially within an accreditation framework, a means of capacity building, of awareness raising, of motivating and redirecting mind-sets.

Globalized Education

The historic functions performed by universities have been knowledge creation, knowledge transmission, and knowledge conservation. Within these essential functionalities have appeared in variant societies and cultures and indispensable social activities such as the production and reproduction of elites and professional classes, the expansion of higher education to other social strata through its democratization and massification, the creation, distillation, and dissemination of scientific knowledge, the codification and conservation of linguistic and cultural practices, etc. Higher education institutions slowly changed to create opportunities for new kinds of inquiry, to fashion disciplines appropriate for their detailed study and transmission and highlight social values of open inquiry and opportunity.

The challenge that rapid globalization and post pandemic world depicts to universities is whether they can incessantly adapt, no longer slowly or organically, but in the quantum leaps that are demanded by new realities. Knowledge is not what it used to be. The aspect by which knowledge is created, transmitted, and conserved now occurs through modalities, institutions and configurations unknown before and at speed once unimaginable. Universities no longer enjoy a priority role and certainly not an exclusivity role in an environment of internet access, media overload, corporate and lifestyle customized offerings, and so on. They unceasingly play a vital role, but it must be recognized that this role must be remolded in the context where there are competing knowledge providers, which they must recognize, network, partner with, and mutually revitalize.

There have always been linkages between universities and the other sectors of society which it serves and for which it proffers the human resource base. But with the pressures brought about by globalization, post pandemic settings and an accelerated pace of development, these linkages exemplify on a new urgency and primacy. The world of work has changed around the globe, and universities must prepare their graduates for careers and jobs for which academic programs do not as yet exist; for this, more intense collaboration is vital. Globalization has fostered progress, in the context of rapid and flexible competitiveness, but in enormous uneven and inequitable terms. .In developing countries, universities are looked upon as having the potential to correct the expanding equity divide by preventing the human resource base of these countries from being left too far behind their counterparts in other countries. Universities can respond to this call only if they are concatenatedly allied to the country's productive and economic sectors. We also could envision the startling acceleration in the privatization of intellectual property as faculty prefers to own and commercialize their intellectual contributions to the overall knowledge process.

The globalization and post pandemic setting pressures on developing countries reproduce some of these dynamics but create whole new sets of problems as well. Universities no longer have the luxury of developing at their own pace, at the risk of being left behind, they have no choice but to strive to offer internationally comparable and competitive programs. Here, developing countries must not replicate western higher education paradigms but indigenously developed forms of higher education in terms of delivery modes, of program content, and even of areas of research. This is especially true in the realm of knowledge conservation, particularly the preservation and enhancement of cultural and national identities and heritages.

The consequence of possible globalization-induced homogenization and post pandemic settings, especially of the forms fostered by the mass media make this task of cultural and language preservation by universities vital for the fostering of a healthy and harmonious society. While repositioning themselves as efficacious agents in the global knowledge economy, universities must also preserve the character of their specific national higher education systems and transmit key elements of national cultural identities and traditions. The emergence of these new roles and accountabilities of offering service to society, the inherent compulsions between serving as handmaiden of government vs. serving as social critic and serving as a collective and heterogeneous set of social consciences, being a predictor of and precipitator of social and scientific transition is changing how universities view themselves, seek resources, and respond to social signals to align their actions with perceived social necessities stemming to an evolution of new modalities to address. These forces and compulsions are doing much to redefine historic notions of the public good and responsibilities of higher education. In an ever more complex and interconnected society, universities now conduct their endeavor in new avenues. This transform the demand and access calculus of higher education. As discussed above, this is being incrementingly realized in closer collaboration with other sectors of society and with collaborators across national and regional boundaries represented by the exchange of students and faculty and the creation of new networks, partnerships consortia, and forms of association currently being invented and defined. The information sharing has enabled a redefinition of communities of research and inquiry.

The ease and speed with which information sharing is transmitted has enabled a redefinition of communities of research and inquiry. They may still have higher education institutions as hubs, but they now routinely constitute the corporate sector, government agencies or sponsoring bodies, international academic colleagues, and civil society. Perhaps, the growth industry of global higher education lies at the intersection between conventional cross-border education represented by the exchange of students and faculty and the creation of new networks, partnerships, consortia, and forms of association currently being invented and defined. The outcome is global education community making this task of cultural and language preservation by universities vital just stemming to take form and assess its strengths and possibilities. These events result in a radical mixing of our traditional categories of reference fostering simultaneously homogenization and variation – a reach for the global amidst an intensification of the local. Fundamentally, the academic marketplace is no longer confined to national settings. Knowledge is becoming universal, escaping borders of all kinds, with unpredictable consequences. Its pursuit and advancement are grounded on the free exchange and circulation of ideas across scientific fields, geographic boundaries, political systems, and academic disciplines.

Irreducibly, the globalized post pandemic world is a rapidly forming, reforming and de-forming of knowledge societies. With knowledge as the dominant currency of future growth and development, universities have little choice but to recognize their ever-changing roles as creator, transmitter, and preserver of knowledge in the context of serving the whole of society. They must perform their roles not just for young adults preparing for their first jobs. The technical requirements of specific professions became so intricate and are evolving so rapidly that even the best pre-service education becomes outdated a few years after its acquisition. There are practical implications arising from job mobility and changing technology. More and more adults will return to university for updating. An engineer for example needs fundamental retraining or retooling to update his knowledge five years after graduation. University must envision its role not only in producing new engineers but also in servicing the current engineering workforce with programs that keep them updated, relevant and efficacious. The foundation of any bridge on the education side must be a restatement of what the purpose of the university is. It is bridging the gap between research and policy and practice, bringing the gap between disenfranchised poor and the rest of the world, bridging the gap between curricular content and the world of work, and bridging the gap between education and the culture of peace. Educators must strive to build more bridges to overcome these gaps.

Universities are no longer the ivory towers of the past, the sole dispenser of knowledge and credentials, the only knowledge store in town. Today, they exist in a world where knowledge is available from a veritable megamall of information sources – the internet, corporate training, distance education, internships, specialized training centers, and so on.
The Globalized Economy

The consequences of possible globalization-induced homogenization and this post pandemic world, especially of the forms fostered by the mass media (and its opposite reaction of polarization of cultures) make this task of cultural and language preservation by universities vital for fostering a healthy and harmonious society. While repositioning themselves as effective agents in the global knowledge economy, universities must also preserve the character of their specific national higher education systems and transmit key elements of national cultural identities and traditions. Ironically, this vital role shares to the resource compulsions experienced by universities as they incrementally suffer the gradual withdrawal of governmental funding for higher education.

The emergence of these new roles and accountabilities is changing how universities view themselves, seek resources, and respond to social signals to align their actions with perceived social necessities. These forces and compulsions are doing much to redefine historic notions of the public good accountabilities of higher education, especially public higher education. This may well be the threshold conceptual framework from which universities in a globalized, knowledge saturated world can articulate their distinctive areas, their unique niche in society. The new vectors comprises the role of the university in offering service to society (far in advance of the conventional third-placer status traditionally handed universities in the pecking order of teaching, research, and service), the inherent compulsions between serving as handmaiden of government vs. serving as its social critic; the accountabilities of serving as a collective and heterogeneous set of social consciences, being a predictor of and precipitator of social and scientific transition; etc.

One likely novel pathway will be the unfolding of new foci of inquiry and, through them, new disciplines. This threshold occurred with the study of globalization itself, which has generated both research and instructional programs with globalization at the core (and in a few isolated instances even service programs, albeit to this point successfully disguised as occupation-related leadership programs). It is arguable, sensibly, that the pace of transition under the impress of contemporary globalization and post pandemic world has been so rapid and extensive that much of what is taught in education, higher as well as basic, depicts knowledge about a world that no longer exists. The compulsions between history, conservation, and irrelevance have been painfully sharpened by globalized post pandemic world irreverent propulsions to transition and its insensitivities to what is displaced by such transition. New research and instructional programs have an urgent accountability to describe and analyze this emergent world. In another pole, this globalized post pandemic world has generated consequences – problems and predicaments – that are not successfully accommodated within existing disciplinary boundaries. New knowledge constellations and modes of inquiry are demanded and are already forming.

Some of these new disciplines are likely to be shaped at the edge of public policy and its varied controversies. For instance, global warming and climate change, problems that extend far beyond conventional disciplines and their finitude of expertise. Another pathway, could be related to the former but with relevant diverging implications, is sustainability, which leads to implications (and potential subfields) of social and cultural sustainability, or agricultural and rural sustainability in what has become since the year 2000 an urbanized world. The knowledge explosion itself is likely to engender new hybrid disciplines much as they shaped over the past sixty years with the generation of communications, information and computing science, and marketing. One would expect the dramatic transitions in digital technologies and their virtual destruction of the practical costs of digital information storage to engender new ways of studying cultural change, consumption, and style conjoined to communication. Even as the pace of social change due to the rapid introduction of digital innovation influences society, so will higher education be pressured to study such phenomena with right and invent knowledge frameworks that expand both society's construal of them as well as assisting policy responses to them. The cultural wars partially engendered and partially stirred by globalized post pandemic world suggest the possibility of an entirely new platform wherein to erect peace studies and the serious pursuit of new inquiries into the nature and resolution of human compulsions.

The unfolding of these new foci, of inquiry and emergent disciplines has in turn stem to an evolution of new modalities to address them. In an event more intricate and interconnected society, universities now conduct their endeavor in new ways. As discussed above, this is being increasingly realized in closer collaboration with other sectors of society and with collaborators across national and regional boundaries. Fundamentally, the academic marketplace is no longer confined to national milieu. More than ever, knowledge is becoming universal, escaping borders of all sorts, with unpredictable consequences. Its pursuit and advancement are grounded on the free exchange and circulation of ideas across scientific fields, geographic boundaries, political systems, and academic disciplines. Even as we predict a doubling of students traveling abroad within the next five years, we are witnessing the unparalleled growth of cross-border education. Both imports and exports abound in this new global market. As societies grapple with the quantum accelerations in demand for higher education and the inability of both their public and private sectors to meet this demand, their governments, at first reluctantly, and then willingly, concede the access and manpower development potential of branches and programs of overseas universities. In many countries, policy frameworks governing the operation and regulation of such cross-border institutions are only now being deliberated and firmed up. In places such as China, Korea, and Southeast Asia, for instance, governments grapple to maintain their aspect of control over the proliferation of offshore campuses, while ceding the necessity of gaining from them the means for greater access within suitable institutional arrangements.

Obviously, distance education is in its early, albeit dramatic, stage of development, both in cross-border higher education and within national boundaries. The open universities stand at the apex of this phenomenon, serving literally hundreds of thousands of students in each of the major open universities in Bangkok, Shanghai, Delhi, London, Arizona and other capitals. The expanded access facilitated by contemporary instructional technology engendered the enormous number and quality control mechanisms that would have been impossible under old distance education systems. And while initial course, a development and the prerequisite infrastructure for delivery makes this model more expensive in its incipience, successive iterations over time dramatically reduce unit costs. At the aggregate social level, as the numbers benefitting from distance education incessantly grow and effective per student costs decline, the resulting capacity will address contentions of access to the light of the massification of global higher education.

The ultimate test will be on the quality issue, the demonstration of which advocates and proponents of distance education are holding steadfast to maintain, composing the rather quiet but considerable expansion of corporate investments in their own versions of higher education to meet constant workforce demands. The worst possible outcome would be for these massive distance education endeavors to shake out as second or third rate enterprises effectively specializing in offering low unit cost education for those unable to obtain it elsewhere in the market. The best possible outcome is to envision distance education, spurred along by its innovative technologies, leading more traditional educational institutions and their delivery modalities toward new ways of doing things, successfully challenging emergent student populations characterized by preferences for new learning solutions.
Leadership and New Communication Modalities

The new and diverging modes wherein a leader deals with and maximizes human resources are also mirrored in the new and distinctive mode the leader deals with and manages information and knowledge. The traditional attribute of a leader as predominantly having the information, knowledge or wisdom to lead the group must not be highlighted in an information-saturated age. Knowledge employed to be one of the elements that vested leaders with natural authority and legitimacy. But as corporations and enterprises are becoming acceleratingly transparent, and as pivotal knowledge becomes more accessible not only from within the organization but also from a multitude of technologically assisted sources, the leader no longer dominates the knowledge exclusively.

Moreover, given the expanding intricacies set of predicaments and tasks that present themselves, the leader himself/herself may not have the lucidified knowledge of final destinations or strategies, as earlier uttered, and may well have to depend on the collective reflection and experience of the group to fashion an articulated vision and strategy for the tasks ahead.

Academics researching corporate management have recently accentuated on the communication flows within corporations rather than the hierarchical structures that their tables of organization depicts. There is an increasing body of evidence that these informal flows determine with amplified accuracy the effectiveness, strategic forward thinking, and rapidity of response to changing environments that corporations exhibit, much more than official superior-subordinate interactions or meetings, or even corporate planning sessions or board meetings. An entire sub-discipline within HBO, now called social network analysis, has researched this phenomenon and documented case studies and created simulations approaches to measure the impact of social networking.

On a personal note, it is preferable to employ frameworks like the quantum theory of trust. We could witness or navigate a variety of efforts of reform or reorganization. Often, the impetus is from the top, either because of a new CEO or minister or even because of a transition of regime or government. Over time, it is obvious that an organization, like an organism, constitute an anatomical dimension, a physiological dimension, and a pathological dimension.

The common inclination in many reorganization efforts was to focus on the anatomical: an attempt to transform the structure of the organization or the ministry, for example, merge departments, add new bureaus, dissipate minor offices, etc. Often, however, the problem addressed was not anatomical in nature, but physiological; the problems could have been addressed by simplifying procedures, setting up regular communication links, without changing structures. It was as if the new doctors were ready to amputate limbs or suture organs together when simple medication to improve circulation or digestion would have sufficed. Of course, if the problem were gangrene, then doctors would have been right to prescribe the anatomical radical measure of amputation.

On the other pole, reform endeavors employed anatomical (reorganization) or physiological (streamlining) measures when the problem addressed was pathological. If there was a bottleneck caused by specific personal inefficiency or corruption blocking smooth operations, the solution should have been to identify the sickness in the organization and to cure it, by replacing the problematic person (s) and/or getting a better alternative.

All this is to illustrate how today's leader must focus to his group's "physiology," to social network analysis, as academics call it. Interestingly, this is more than just finding out which subgroups gravitate together and who talks to whom more. The observant leader will discern that individuals tend to talk to diverging people for diverging reasons. A person would talk to one officemate for normal work operation but talk to another colleague for social contacts and activities outside the workplace and yet a third for new ideas and innovations at work. There may well be a fourth colleague, more like a mentor, when the individual needs further information or career guidance and yet another person for general wisdom and learning both about work and about life problems in general.

The leader may, and probably may not, be one of these colleagues, but it is transparent to visualize how the leader's knowledge of the networks of the individuals in his group can be very pivotal. They help him/her formulate the most effective task forces, they help him/her in advocacy campaigns when he/she has a new campaign or task or project that demands the commitment and enthusiasm of all, they aid in formulating approaches and paradigms for soothing personal frictions that emerges, and so on.

Today's fast-changing world demands a constant supply of new paradigms to address persistent predicaments, new situations, and the desired states never before thought possible. This means leaders who are working to achieve better futures or worthwhile outcomes must constantly depend on creative and new insights and innovations and can no longer depend on what may have been effective so well in the past. This also means that the source of the new insights can no longer be exclusively from the leader.

An analogy with the teaching profession: whereas once upon a time, the teacher was the oasis of knowledge, or at least, the map owner for the oasis, to which he/she would lead the students out of the desert of ignorance. Today, the students located themselves in an ocean of information and knowledge all around them, and the teacher located himself in the same boat, acting not as a source of the knowledge, but as a facilitator and guide to make sense of the plethora, how to digest and correlate it, what to absorb and what not to absorb, how to process it to arrive at new knowledge.
In a similar fashion, the leader, as captain of the ship, must unceasingly guide and navigate it, enlisting the commitment and collaboration of the crew, even as he learns from them many things about how best to navigate as they moved forward in a common purpose in a desired general direction and vision, without really pinpointing an exact destination and a route to get there as these will evolve as weather, circumstances, and new knowledge evolve and develop.

Today's corporate world is in the throes of redefining its goals and directions. Nowhere is this more evident than in corporations in developing economies. The traditional perspective on development tended to use two paradigms: the community organization prototype and the entrepreneurial or business development prototype. The first was characterized by initial impetus from an NGO or external philanthropist but with full community participation eventually, premised on the valid fact that sustainability and relevance depended on internal acceptance and ownership. Often, however, the process was too extensive and restricted, as local capacities had to be developed and external inputs and experts dwindled and moved on, rarely creating the major impact that authentic development is essential.

The second paradigm was that launched by the entrepreneurial investor or the benign imperialist. Developing countries are spotted with human settlements that have been improved and transformed and which thrive on the life sap of a huge manufacturing, milling, forestry, mining, or even military establishment that has located itself in that community. Here, outside resources are poured in, long term commitments are made, and the transformation in enclaves of progress is fast. However, there is often no attempt at real community development; human resources are merely physical labor or consumer populations.

More significantly, revenues and benefits from growth do not remain in the community but are siphoned off to external stockholders. In fact, whereas economic indicators may depict remarkable progress, there are more often a marked deterioration in the quality of life and emerging social problems and unrest.

Corporate leaders are now visualizing a necessity to bridge the gap in the available models. There is a necessity for them to refocus their energies, their experiences, and the rigor and success of big business away from single-product linear enterprises toward the global and systemic problems of a development society. And this can be done only if they assume a new approach for their strategy and operation. A recent corporate experiment has attempted such a refocusing, placing a concern for integrated human settlements development as its primary corporate objective and using a range of linear product lines as means to support this.

There is a fundamental distinction between a resource development policy dictated as configuration of a total development goal and those dictated by merely seeking raw materials, even if both are operating ultimately for profit. For example, a logging company that comes into an area for the sole purpose of cutting the commercial timber to service a foreign market will have an operating strategy that is quite distinctive from that of a development company whose objective is to unfold viable human settlements. The logging company's job is finished when the logs have been converted into revenues. For the development company, the revenues from the logs are merely the means for providing capital to develop the infrastructure facilities and the other sources of livelihood for the population of the region (and implicitly creating more business opportunities for the development company). Both are organized for profit, but one earns from marketing the logs; the other earns by producing a permanently viable community and developing the total resources of the region.

Effecting such a change in a corporate paradigm as describe above is not an easy one, and it takes a new and different kind of corporate leader, moving into unchartered seas with a difficult yet vital and exciting new vision, to effect this transition. But perhaps more than the corporate sector, more than just about any other sector in society-transportation, communication, banking, entertainment, health, etc. It is the education sector that most needs its leaders to navigate them into unchartered waters.
Other sectors mentioned have responded, sometimes by sheer necessity of survival or competition, to the changing demands of society and have transformed the very shapes and paradigms of how they work. ATMs, cell phones, cable TV, virtual health clinics, email-all unheard or unimaginable two decades ago-are merely some indicators. On the other hand, schools and universities have remained virtually unchanged and operate just like they did, with perhaps a few more computers, twenty or thirty years ago. Perhaps it is because of the sheer size, stability, and centuries-old prestige and deference given to this sector, and yet, they are not meant to be just the custodians of the past; they are supposed to be the forerunners of the future, responsible for the formation of future generations.

Recently, people are debating on the significance of leadership and charisma, a leader must possess. It is an unceasing matter of debate whether charisma is inborn or can be developed. And yet, it is probably the single most obvious characteristic that one observes when one encounters an authentic leader. It is often a magnetic personality, an affable charm, or a stunning, even if not very pleasant, presence. The person walks into the room, and eyes and attention automatically gravitate to that person. Leadership programs, charm schools, courses on effective speaking, and so forth abound in an effort to offer at least the trappings of charisma for certain managers and leaders, and they may succeed to a limited extent. But they often succeed in offering the acquired external techniques for better first rather than imbue the person with that intangible quality called “charisma”.

Conclusion and Recommendations

Summary and Conclusions

There are extensive attempts to reform educational systems. The proliferation of programs to develop professional education managers has engendered a generation of competent educators. But their reform efforts have been extensively on improving existing practice, on efficiency rather than on effectiveness, aimed at modifying or improving the existing dominant paradigm rather than coming up with new paradigms. Thus, for example, curriculum reform highlight on how to improve and sequence the teaching of specific subject matter blocks, rather than on how to question whether to teach that subject at all or replace it with new learning content. Another example would be proposals to expand access to an existing educational system without questioning whether the system itself is not designed to reach the unreached. Reforms in university education look to alternative financing mechanisms and equitable cost recovery mechanisms without questioning whether expansion ultimately leads to accentuations on credentialing rather than competence and eventual devaluation of such credentials, which the corporate sector has started to do.

An analogy from paradigmatic shifts in transportation and written communication may be helpful. The necessity for faster transportation over longer distances was met not by constructing a better and better car but by finally inventing the airplane. Similarly producing the written word was improved not by improving the typewriter but by developing word processing in a computer. The time has come for educational leaders to stop trying to improve the education "typewriter" or "car" and invent the laptop computer or the airplane, or the submarine, or the bicycle or the desert camel cart, or whatever the particular fast-changing education necessities of the community demand.

And by being open to, and constantly on the lookout for, innovative possibilities, which actually exist in often unrecognized places, can the educational leader moved into the unchartered waters of a future system of education that truly meets the fast-changing needs of the learning community that his/her team must address. And in the face of rigid and traditional bureaucracies, both leader and team must be possessed with a conviction that a paradigmatic change has become vitally and a daring yet realistically achievable vision capable of generating the momentum and eventually the commitment for true change imbedded.

The authority of leadership traditionally derives from many sources. In olden and tribal days, the very fact of age – in societies where longevity is a real feat – de facto clothes village elders with the authority to be listened to and heeded. More organized communities eventually evolved some form of leadership selection, by feats of prowess or skill, by competition among rivals, or by acclamation of some form of voting. In this case, community acceptance was the source of authority of the leader. In more recent times, industrial societies have institutionalized corporate structures, and pecking orders were sanctified and upheld in elaborate organizational charts specifying many hierarchical levels. Authority was vested in the leader simply because he or she was the VP or the director, or the chief, or even the supervisor; it was the authority of position. The information explosion occurred, and even before that, a new kind of authority emerged, the authority of the expert, regardless of where that person was in that organizational chart or even as an outside consultant; it was the authority of knowing what others did not know. But again, authority and leadership are not congruent ideas. The authority deriving from age, or from group acceptance, or from a hierarchical position, or from knowledge may be enough to ensure compliance in a "command and control" environment but does not automatically lead to the committed and inspired group work ethic characteristic of a team headed by a true leader. Perhaps the single most telling source of authority of a true leader is a sense of vision and a commitment to that vision. Nothing is more contagious than this in a work setting.

Needless to say, the vision has to be one that is well chosen and articulated. A vision that is vague and utopian, no matter with how much eloquence and enthusiasm it is spoken about, will not necessarily inspire to action the desired goal which may be too immeasurable or unreachable. On the other hand, if the vision is mere articulation of a standard work target (such as sales goal, or a more satisfactory customer rating), it may not serve to inspire. Too many managers have reduced their vision in this way and fail to take the opportunity to see beyond and inspire their teams with the underlying rationale and vision giving rise to these targets.

Today's more effective leaders on the world stage shine as having dedicated their lives to larger yet identifiable visions, which have inspired and motivated thousands of others over several decades and changed the world in specific ways.

Communicating that vision is the second part of the task. Of course, in major cases, the communication becomes automatic and obvious in the very dedication and commitment of the leader's entire life time to a cause. In smaller cases, where the project leader has a specific vision for a limited time, it is important that his/her vision and the accompanying commitment and enthusiasm for that vision be explicitly passed on and shared with the entire group. Again, the work ethic and example displayed by the leader is the most effective tool, but explicit mechanisms such as planning/strategy sessions, having team members explain the project vision to outside groups, media releases, etc., are good tools to share the excitement of the vision.

UNESCO is an agency mandated not just to study and analyze problems, but to solve or to assist in solving them. It is not a university or research institute but an interagency mandated by its ministers to actively make a difference. Action without reflection can be dangerous, so also reflection without action can be sterile. In these globalized post pandemic world, fast changing times, universities have the opportunity, indeed the obligation, not just to understand and analyze learning systems and processes around the world, but to assist in improving or re-conceptualizing them.

The policy issues that globalized post pandemic world has imposed upon higher education is open for resolution. Those responsible for higher education must grapple with these with a sense of perspective, a foresight for the future, and a vision for the role of the university in that future. If they do so, higher education, no matter what forms, modalities and linkages it will take on, will continue to be, as it was throughout history, a beacon light and an essential dynamo of development for the societies it serves.

Recommendation

To respond to this fast transition, it is pivotal to have a clear new vision for education, not just for information dissemination, or for skills development, or for citizenship, but for empowering individuals and communities to thrive in and contribute to greater, more equitable and sustainable interdependence among communities and countries – in political, economic, and socio-cultural spheres.

Innovation is essential as a concession to the indispensability of education for sustainable development. The tasks of sustainable development transcends the task of universities, partnerships and participation are inevitable. In a globalized society, such partnerships have to be both local and international.

Transition from the conceptual to the practical. knowledge is available from a veritable megamall of information sources – the internet, corporate training, distance education, internships, specialized training centers, and so on. Universities must learn to collaborate and interface with these various sources. It must be able to find its unique niche as the flagship store in such a megamall setting – focusing on developing the total person, establishing the benchmark professional standards, participating in international recognition, quality and accreditation standards, and ranking initiatives. Quality assurance is pivotal. Evaluation and assessment must be undertaken It is pivotal to have a means of capacity building, of awareness raising, of motivating and redirecting mind-sets. It means reinventing, not just reforming or improving our systems. The times call for a fundamental shift, a fundamental reorientation on how we look upon our work and how the urgency of this new perspective demands no less than a revolutionary rethinking and redoing for sustainable development.

We must establish a radically new paradigm of sustainable development for the role of higher education in this fast-changing world. We must discover new possibilities in translating that paradigms to carry out the mandates of our universities. To this objective, we must amplify our partnerships and participation, both locally and, because of a globalization where knowledge knows no boundaries, internationally as well.

Finally, we must lead our universities in the practical day-to-day pursuit of sustainable development, translating that imperative into new paradigms and mind-sets for our faculty, our students, and the communities we serve.

The future will bring changes beyond our imagination. But it is our duty as universities and as human beings to ensure that this planet will be sustainable and that we do not destroy this future environmentally, socially, economically, culturally, or morally. The cause we serve, the sustained development of our planet as one that is unceasing to be free, peaceful, just progressive, and harmonious, is not only urgent but vital. We have no choice. The mission is pivotal but nothing short of noble. After all, this fragile planet Earth is the only home we and our children, and our children's children, will ever have. There is no other.

Acknowledgement

Special Thanks to the School of Arts and Sciences Dean, Dr. Donna R. Lariosa, Prof. Louie Garcia, chair, Office Administration, respondents, faculty and Staff of Aklan State University.

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Research Is Life: The Lived Experiences of Pre-Service Teachers on Their Research Course

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Abstract - Research is one of the trifocal functions of higher education in the Philippines. It is further cascaded to undergraduate research to ensure that undergraduates in collaboration with their mentor contribute intellectual discoveries or creative output relative to their discipline through research. This phenomenological research was undertaken to highlight the lived experiences of preservice teachers on their research course. To achieve this purpose, twenty-four preservice teachers enrolled in the course Research in Elementary Education A.Y. 2020-2021 were interviewed through online video conferencing. Based on the accounts of the participants, partnership, interaction, guidance, and fulfillment were among the four significant experiences in the course. It was further highlighted that challenges encompassed internet connection, writing the literature review, gathering data, and time constraints. Resources, hardware, support system, and time management were found to be the best practices of the participants in terms of addressing the identified challenges in the course. In terms of the necessary skills and attitude to be successful in the course, participants emphasized the need for communication, teaming and collaboration, information, media, and technology literacy, flexibility and adaptability, critical thinking, and time management skills. Also, motivation and perseverance were among the significant attitudes to be developed in taking the course.

Keywords - Undergraduate research; Preservice teachers; Phenomenology; Philippines

Introduction

Research is one of the triad functions of Higher Education in the Philippines (CHED Memorandum Order #30 s.2010). It is further cascaded to undergraduate research to ensure that undergraduates contribute intellectual discoveries or creative output relative to their discipline through research (Wenzel 1997; Stoesslein & Kanet, 2016). Research denotes a purposeful analysis to understand an existing educational concern (BERA-RSA, 2014).

The Council for Undergraduate Research and the National Conferences on Undergraduate Research emphasize that undergraduate research collaborates between students and faculty members. It further stimulates a learning process such as identifying and devising a disciplinary or multidisciplinary technique, defining a specific investigative topic, executing the project, and disseminating findings with others. It is further revealed that undergraduate research instills higher thinking skills, enhances students' knowledge, advances science literacy, and develops problem-solving skills.

The preservice teacher research serves both as professional development and an empowerment tool. It can develop a reflective practice that leads to the improvement of the teaching profession. Also, it allows them to utilize theory to support choices about various issues in their practice and share insights with others (Katwijk, Berry, Jansen, & Veen, 2019). Student research in teacher education is becoming a common requirement around the world, owing to the fact that research literacy constitutes an essential foundation for the holistic professional development of teachers (BERA-RSA,2014; Sachs, 2016).

Perella, Dam, Martin, MacLachlan, and Fenton (2020) undertook a qualitative exploratory study to identify the experiences surrounding undergraduate research and inquiry and the barriers faced by facilitators and educators in its implementation. The data revealed that three models exemplified undergraduate research implementation and practices (i.e., scaffold, bookend, and abstract model). The scaffold model described programs that integrated the method across the whole undergraduate curriculum. The bookend model focused on the early introduction and future use of undergraduate research and inquiry.

Lastly, the abstract model did not engage in investigations. Stakeholders also mentioned financing, teacher buy-in, limited student experience, and intrinsic competitiveness as barriers.

Students' motivations for participating in research include an improved understanding of terms and an interest in developing transferable skills. The most often reported hurdles included a lack of time and funding to perform research projects (Partido & Colon, 2019). Researchers needed research courses in the curriculum, research mentors, and strong undergraduate research committees to overcome research limitations.

Additionally, a study on the preservice teachers' experiences in conducting action researches elucidated that preservice teachers recognized that it was not only that they developed research skills from conducting an authentic study, it also provided them an opportunity to acknowledge their strengths and areas of development in their teaching (Kennedy-Clark, Eddles-Hirsch, Francis, Cummins, Ferantino, Tichelaar, & Ruz, 2018).

Evidence depicted the urgency for teachers to be engaged with research to have a thorough understanding of the most recent innovations in the discipline, as well as efficient instructional strategies that lead to the development of their pedagogical content knowledge. Further, among the needs of teachers encompass the ability, motivation, and opportunity to utilize research-related skills to examine what works and what is not entirely effective in their practice (BERA, 2014).

With these pieces of existing evidences, it is deemed necessary to undertake this research to highlight the lived experiences of preservice teachers on their research course A.Y. 2020-2021. Specifically, this study focused on preservice teachers' significant experiences and learnings on the course, the challenges they encountered in the course and best practices in addressing them, and the necessary attitude and skills that helped them succeed in the course.

Methodology

Research Design. The research utilized phenomenology to describe one or more individuals' consciousness and experience of a phenomenon, particularly their experiences on the course Research in Elementary Education. The purpose of phenomenological research is to obtain a view into your research participants' lifeworlds and to understand their meanings (i.e., what something means to them) constructed from their "lived experiences" (Johnson & Christensen, 2014).

Participants. Twenty-five (25) students of Bachelor of Elementary Education participated in the study. Of this number, twenty-three (23) were female, and the remaining two (2) were male. The study participants were third-year students of Batangas State University ARASOF- Nasugbu College of Teacher Education, the school year 2020- 2021. Total sampling was used to select the participants.

Data Gathering Procedure and Ethical Considerations. The researcher asked permission from the Program Chair and the Dean of the College of Teacher Education. Upon the given approval from the concerned individuals, the course students went over their research course for two semesters with three units and one unit, respectively. During the first-semester students of the course: explain and apply the nature, purposes, and processes of research in crafting a knowledge-based study aimed at improving the quality of education; demonstrate proficiency in formulating research title, statement of the problem, and hypotheses considering the ethics and appropriate format and style; combine and apply the theoretical and practical approach in writing research literature; manifest their knowledge and skills as regards research methodologies, instrumentation, sampling, data collection, and data analysis; interpret the data and analyze the results and discussion utilizing cross-referencing; and formulate conclusions and recommendations based on the statement of the problem and significance of the study, respectively. Students during their second semester had finalized their manuscript and presented the results in an oral examination.

The researcher secured a consent form from the participants. It was explained they have the independence to participate in the interview and/or FGD and can cancel their participation if they decide to. Additionally, participants were not given monetary remuneration but were provided with a certificate of participation. It was also assured among the participants that the provided data and responses will be treated with the utmost confidentiality and will be compliant with the requirements stipulated in the Data Privacy Act of 2012. Participants were interviewed using the Google Meet platform.

Online interviews through Google Meet using a semi-structured guide were utilized to understand the students' research experiences. Five students were involved in the focus group discussion to validate the responses of the participants. Further, an online self-reflective journal, one of the course requirements, was also utilized to establish the significant experiences and draw about meanings from these accounts.

Results were analyzed using Braun and Clarke's qualitative interpretation, including familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report (Lorelli, Nowell, White, & Moules, 2017).

Results and Discussions

1. **Experiences in the Course Research in Elementary Grades**

Four significant experiences were highlighted based on the accounts of the participants. It includes partnership, interaction, guidance, and fulfillment.

Partnership. Based on the interviews conducted among the participants, they claim that their best experience in the course is their collaboration with their co-researchers. The words of P1-24 can support this, "My best experience is the fact that I have groupmates whom I can ask whenever I needed clarifications in our research". Further, according to P1, 7, 9, 12, and 16, they have a research partner conducting the study, so they have someone to share ideas with and work with. This means that it is beneficial if researchers are accordingly grouped as it provides them interaction and partnership that lead them to achieve common goals. Also, collaboration in research has always been encouraged as it broadens the research scope, thus increasing its reliability.

Interaction. Accordingly, it is also highlighted that in the course of data gathering, participants had significant experience notably; it provided them an avenue to interact with other students in the University. This finding was reinforced by interviews with the respondents and was substantiated by the focus group discussions with the key informants about their interaction during data gathering. Some of them stated that: "It is when the questionnaires were already in Google Forms and sent it to our respondents" (P1, 2, 9, 10, 13, 14, and 15). "Another best experience is when we did our data gathering because we had the chance to talk with other students from the same department. We were not just able to gather data, but we gain new friends as well" (P13). "Communicating with the respondents/interviewees is my favorite part. I am glad about the chance to interact virtually with other people during this pandemic period. This virtual interaction made me feel that I have built a sincere connection with them since we aimed to benefit them by knowing their perception and explain it in our paper" (P14). "My best experience in this course is when we are conducting our survey. I am always excited when sending our survey questionnaires to meet different learners who become my friends now (P15). It can be attributed to the idea that amidst pandemic, mass gatherings, including face-to-face classes, are restricted; thus, limiting students' social interactions.

Guidance. According to some participants, the guidance given by their research instructor and adviser during the course can be considered their best experience in the course. This can be strengthened by the interviews and accounts of the key informants during FGD regarding the guidance given by their instructor and research adviser during the course. Some of them mentioned: "Because of the thorough discussion of our instructor on the research processes, I can write our research and for me, it is my best experience" (P8). "The technical assistance given by my research adviser had helped us in finishing our research" (P3). The aforecited quotes shed light on the idea that training and guidance provided by the research community (e.g., research instructor, research adviser, statisticians, and significant others) significantly contribute to the success of undergraduate research.

Fulfillment. It was also claimed that the participants' best experience could be described when they passed the oral examinations (proposal and final), which signified that their efforts and hard work had paid off. This finding is supported by the interviews and ideas provided by the key informants during the FGD on their fulfillment during the course. Some of them asserted: "My best experiences in this course were when our group finished writing our manuscript and when we finished defending our research paper" (P5). "My best experience was when we defended our thesis. It was nerve-wracking, but in the end, we survived; we defended it" (P6). "One of the best experiences was when we were able to finish our thesis defense. Although defending the thesis is far from what others say and what I have imagined, I can say that it is one of the best things because we survived it. It felt like all the sleepless nights and sacrifices had finally paid off, although revisions are not yet over. For us, it is something to celebrate because we know we worked hard for it" (P13). It can be stated that reporting and evaluating research as one of the processes can be viewed as challenging for most researchers. However, this plays a critical role in the overall success of the study; thus, this needs to be improved among students.

2. Significant Insights/ Learnings in the Course Research in Elementary Grades

In order to further understand the lived experiences of preservice teachers on their research course, they were asked about their significant insights/learnings in the course.

Research process. Most participants had gained significant learnings on the research processes. The accounts of the participants can support this finding during the interview and FGD. Some of them claimed: "Use valid sources that are relevant to the topic" (P2). "In conducting research, there are a lot of methods so, it is imperative to select the most appropriate one" (P8). "In this course, I learned how to properly conduct a research study, unlike when we are in Senior High School. I become aware of the process of collecting data. I also learned that when conducting a study, all the gathered data should be properly analyzed, interpreted, and presented to show our findings clearly. I also learned that everything should be written carefully and make all the content of our study valuable and significant. Also, the findings, recommendations, and conclusions should be aligned with our statement of the problem and the output to be proposed in the study (P9). "Taking the course Research in Elementary Grades gave me so many learnings. Now, I feel more capable than before since I already have the experience of working on a thesis starting from scratch until it becomes a whole manuscript. I became more familiar with the process of research, including the format and style of every chapter. I also gain an understanding of the importance of literature review in a study from beginning to end. I also learned the value of ethics in gathering data. I have also become knowledgeable about the different kinds of research one may conduct. When it comes to interpreting data, I learned that it should also be well supported by facts aside from what we have gathered. Taking this course also allowed me to explore and learn more about different productivity tools that I hadn't known before. I also learned about some statistical tools used in research, how it is done, and what kind of data is appropriate" (P15). This is a very positive finding as their knowledge of the research processes may help them improve teaching and learning. Further, it may also be used to pursue higher learning (e.g., Master's degree and Doctoral education).

Communication. Participants also mentioned that they have learned about the importance of effective communication skills in conducting research. Some of them specified: "I have learned how to communicate with our respondents virtually. I also learned that I needed to set a schedule for an interview to carry out successful data gathering" (P5). "Some of our participants were not willing to participate in the study due to time constraints; I have learned to effectively communicate to make a consensus in terms of the schedule for our interview" (P1-5). It is a significant finding as effective communication increases productivity in general. If researchers are effective communicators, it will constitute their success in conducting the study.

3. Challenges and Best Practices

As revealed in the findings, there are challenges that participants experience in their research course. Additionally, they shared their best practices to address the challenges they had in the course. Challenges identified encompass internet connection, literature review, data gathering, and time constraints. Best practices highlight resources, hardware, support system, and time management.

Challenges

Internet connection. Brought about by CoViD 19 pandemic, most schools needed to shift to flexible learning that involves online learning, modular distance learning, and/or a combination thereof. Relative to this, participants had difficulties in the course due to the reliable internet connection. Some considered it a challenge to communicate with their groupmates, research instructors, research advisers, and their respondents due to inconsistent internet connection. The statements of the participants reinforce these results. P1 is quoted as saying, "First is the poor internet connection where we find it hard to communicate, cope up during our discussions and continue with the revisions of our paper". According to P7, "The primary challenge that I encounter has a slow internet connection. I encounter this challenge mostly when we are gathering data". P8 communicated, "Then of course online class is more difficult to do one of the extreme reasons is the connection, so it causes to take longer or be harder to work on each part that needs to be fixed". This finding is further described in the words of P9, "The challenges that I encounter is like the challenge that I still encounter in my other subject. The poor or weak connection that I had. I tried to try a different sim, but nothing of them works better. It was most challenging because I couldn't even understand simple sentences by our professor; it was so inaudible on my end".

Further, P14 illustrated that one of her challenges in this course was attending classes due to unstable internet connection and power interruption. There are times that she missed class discussions due to this challenge. This aspect needs to be improved to promote quality education in the country. According to Ookla Speedtest, in February 2021, the Philippines climbed to 83rd spot for mobile and 92nd for fixed broadband internet speed out of 140 countries (Department of Information and Communications Technology, 2021).

Literature review. Another challenge that was noted among the experiences of the participants was in writing a literature review. Participants were challenged in locating, selecting, and summarizing resources. Some of them conveyed: "My challenge in this course was to find different related pieces of literature in our research topic" (P5). "The challenge in the course Research in Elementary Grades is to find some literature that can be connected to our study because our study is new so that we can't find related research on it" (P12). "The challenge that I encountered in this course is finding relevant literature" (P16). The finding coincides with the claim of Creswell (2012) that it can be challenging to search and locate good pieces of literature because of the vast information available.

Data gathering. Some of the participants likewise narrated that they had difficulty in gathering their data. These results can be gleaned from the interviews and accounts of the participants during FGD. Some of them related: "The challenge that I experience is when we are constructing our questionnaire. We found it difficult to find items that would truly suit our research objectives" (P6). "The challenge in this course is when we are struggling with the collection of data. It took too long to complete our respondents because many of the students are not giving time to answer our survey questionnaire" (P9). This challenge in conducting research may be addressed depending on the ability of the researchers to determine the participants to study, obtain permissions needed to conduct the study, consider the types of information to collect from several sources, locate and select instruments, and administer the data collection process to collect data.

Time constraints. As this course is one of the many courses that preservice teachers take simultaneously, they looked at time constraints as a challenge in conducting their study. According to most participants, they had difficulty in submitting research outputs on time, for they also had several requirements in other courses. Participant 14 is cited in saying: "Taking it together with other courses has been stressful as the overloading tasks and deadlines approach. We find it difficult to manage our time, and it makes us feel so restless sometimes. There are also times when we are unsure about what we are doing because we could not clarify instructions given to us". The aforecited quote agrees with the idea that most teachers experience the same situation in writing research. With several workloads and other course requirements, they are limited to accomplishing their research in a specified time.

Best Practices

Resources. In order to address the challenges identified by the participants, they shared that in terms of writing literature, what helped them was to use resources provided by the research instructor and those that can be found online. Some of them mentioned: "I looked for the reading materials we used last semester and used them as my pattern for making the whole manuscript" (P3). ". In terms of difficulty in writing our research study for the course, I try to look at the samples provided and also from the modules" (P7). "However, the strategy that I use is to look for a pattern of the old research paper to guide me as I make each part" (3). The findings established the need to provide relevant resources (e.g., e-books, modules, and research samples) to guide students in writing their research. These resources must be readily available in the learning management system for students to access these materials whenever necessary.

Hardware. In terms of internet connection, participants opted to spot their best location at home to establish reliable internet connectivity. This finding can be supported by the interview of the participants on how they addressed their internet connectivity challenge. Some of them declared: "Seek the best spot where you can find convenience as you do your study" (P1). "In terms of the challenge of having a low internet connection, I try to find a stable internet connection when we have discussions and also when we are working on our research study" (P10).

Support system. Most participants mentioned, "I overcome those challenges by believing that we can finish writing and defending our thesis. I overcome those challenges through the unending support and motivational words coming from my family and friends" (P5). "Engaging with peers. Asking my friends and classmates what the lesson that they had discussed in class. Gladly, they responded and cared for me. They help me and answer my numerous questions about the course" (P9). "In terms of clarifying instructions, we reached out to our instructors and other classmates for help. We also made sure that we'll clarify every instruction given to us so that we will not be left confused again" (P13). "I overcome these challenges by making a connection with my peers, and when I missed the class discussion, I chat with my friends to ask if what the discussion was all about" (P15).

Time management. "When it comes to overloading tasks, I learned to comply with requirements as early as possible so they would not pile up on my To-do List. After it is finished, that is when I start working on the thesis again so I'll be more focused" (P13). "Since my problems came from myself as well, I seek the presence of my research partner. We decided to have a communication every time. Also, we do not procrastinate. We learn to set aside other interests and focus on understanding our modules" (P14).

4. Necessary Skills and Attitude

In terms of the necessary skills and attitude to succeed in the course, participants emphasized the need for communication, teaming and collaboration, information, media, technology literacy, flexibility and adaptability, critical thinking, and time management skills. Also, motivation and perseverance as significant attitudes to be developed in taking the course.

"The necessary skills and attitude that help me in taking this course are being productive, determined, and bring positive-minded" (P5). "The attitude should be is to be patient and temperate. Be patient because a lot of revision will be done in the study, it is difficult to do, and you need to give a lot of attention and effort and diligence in reading to be the basis for making a research paper. Also be temperate, because sometimes there are points that will make you angry with your groupmates because you do not agree on things or maybe the groupmates become lazy and does not want to do what should be done which is the reason for you to do not understand each other and certainly will not help in making the paper, so just practice being temperate" (P8). "I believe having a positive mind and a wide range of patience helps me a lot while taking up this course. I may be experiencing breakdowns, but I am not getting to the point where I will stop. Becoming a leader is not easy; I should remain calm and must not pressure my team; instead, I should always push them at their best. Having open communication with the team makes everything go smoothly" (P10). "For me, it is perseverance in doing this, because even though you revise the paper so many times always think that the research paper that you are doing will lead to success" (P11).

"The necessary skills and attitude that help us in taking the course in the course Research in Elementary Grades is the cooperation with my groupmates, time management, and understand each member because when we help each other, we can easily finish the research and if there is some revision each member is trying to help to finish it. Cooperation is very important" (P12)

"For me, the necessary skills are having patience, a positive mind, and strong determination. Doing research is a very long process, and it is kind of draining at times, so having that determination to keep on doing things even one step at a time is important. It is also necessary to always be focused on your goal so that motivation for finishing the task remains. Taking this course has brought me a lot of negative thoughts, but having that attitude of looking at the bright side and the bigger picture is what keeps me going" (P13). "The necessary skills and attitudes that helped me in taking this course are time management, communication skills, analyzing the information, and being more patient in accomplishing the tasks given by our instructor" (P15). "The necessary skills and attitudes that helped me in taking this course are cognitive and cooperation skills because in making a particular task or study we should have those things to produce a better output" (P16).

Summary of Findings

The study's findings revealed that participants were able to practice collaboration with other researchers alongside their interaction with other students in the University during the data gathering process, hence, improved their communication skills. Further, it was highlighted that guidance from the research community (e.g., research adviser and course instructor) and the fulfillment after the completion of the research paper were among the significant experiences of the preservice teachers. The latter also contributed to the complete understanding of the research processes of the participants. As revealed in the participants' accounts, internet connection, literature review, data gathering, and time constraints were among the challenges they had experienced in their research course. Their best practices to address the challenges include resources, hardware, support system, and time management. In terms of the necessary skills and attitude to succeed in the course, participants emphasized the need for communication, teaming and collaboration, information, media, technology literacy, flexibility and adaptability, critical thinking, and time management skills. Also, motivation and perseverance as significant attitudes to be developed in taking the course.

Acknowledgment

Profound gratitude is extended to Assoc. Prof. Lorenjane E. Balan, Laboratory School Principal, and Asst. Prof. Lorna V. Dacillo, Elementary Coordinator, for their limitless encouragement to conduct this quest for knowledge. Accordingly, the author wishes to acknowledge his students for the stimuli to conduct this academic endeavor.

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Barriers and Challenges of Flexible Learning of 1st Year BSIE Students at Quezon City University

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Abstract - The COVID-19 pandemic has brought changes in almost all aspects of our society, especially in Education. In the Philippines, classes in all levels were suspended early in March 2020 to slowdown the spread of the virus. But since the pandemic is far from over, the Higher Education Institutions (HEIs) decided to promote the Flexible Learning (FL). This study aims to determine the challenges and barriers encountered during the transition to Flexible Learning. To test the hypothesis if challenges and barriers encountered have significant association and if there is a difference among the strata, an online survey was distributed to the respondents. Responses were analysed using Spearman's Rank-Order Correlation and Kruskal-Wallis H-Test. The results showed that the Available Devices has a significant impact to the Self-Paced Learning and Submission Timeline. Moreover, the Internet Connectivity has a significant impact to the Submission Timeline and Self-Motivation. Furthermore, there is no significant difference in the level of difficulty to challenges and barriers in transitioning to Flexible Learning in terms of strata. These results suggest that the HEIs should focus on the identified barriers of FL because it significantly impacts the accomplishment of FL.

Keywords - COVID-19 Pandemic, Flexible Learning, Higher Education Institutions

Introduction

When the news and devastating effect of the Covid 19 virus spread globally the whole world has been changed drastically and fear has encompassed every nation because of the fast and uncontrollable increased in the number of Covid cases. The pandemic has brought changes in almost all aspects of our society. It has created the largest disruption of education systems in human history, affecting nearly 1.6 billion learners in more than 200 countries. Closures of schools, institutions and other learning spaces have impacted more than 94% of the world's student population. (Sumitra, Roshen, 2021)

In the Philippines classes in all levels were suspended early in March 2020 in order to slowdown the spread of the virus, and the reopening of classes despite the pandemic has been the subject of many debates. But since the pandemic is far from over the Commission on Higher Education (CHED) decided to promote the Flexible Learning as an alternative. According to J. Prospero E. De Vera III, Chairman of CHED, "We are promoting a strategy of flexible learning where those who are prepared to offer courses fully online can start immediately. While those that cannot offer fully online might provide offline modes of learning using modules." Online learning is one of the methods used by HEIs to support traditional learning (Janse van Rensburg, 2018). The use of modern tools such as email, audio, and video teleconferencing for online learning (Schindler, Burkholder, Morad & Marsh, 2017) are some of the tools that can be used by academicians

With this new system of education, Quezon City University strive to pursue and prepare for the forthcoming opening of classes despite the many problems it has encountered. With the support of the city government the university were able to reopen its classes for the school year 2020 - 2021 in the first week of October,2020. As the classes progresses, we in the academe were confronted with several interrelated barriers as we tried to adapt to online learning. Most frequently encountered were difficulty adjusting learning styles and poor communication between educators and the learners due to poor internet connectivity (Baticulon et., al,2021). Although there are also some studies saying that online learning is more cost effective and convenient than traditional one and provides opportunities for more learners to continue their education (M. C., Casal, 2020)

From this, the study aims to assess the challenges and barriers that are encountered by the first-year students at Quezon City University specifically in the degree program for Bachelor of Science in Industrial Engineering and be able to find ways to improve the quality of its existing learning modality.

Methodology

The research method used for this study is the Descriptive Quantitative Design to determine the challenges and barriers of Flexible Learning as perceived by the 1st year BSIE students at Quezon City University. Descriptive quantitative research design used because the researchers described and determined the level of difficulty of transitioning Flexible Learning in terms of Self-Paced leaning, Submission Timeline, and Self-Motivation. Also, the researchers determined the barriers that the respondents encounter in terms of Available Devices, Convenience in performing laboratory activity, Communication with Instructors, and Internet Connectivity. Furthermore, the researchers determined the significant difference on the challenges and barriers encountered during the transition to Flexible Learning according to the section of the respondents as their strata. Lastly, the researchers also determined the significant relationship among barriers encountered and the challenges of transitioning to Flexible Learning of the 1st year of BSIE students.

Results and Discussions

There are 12 sections of 1st year BSIE students for the current school year with a total of 578 students. The researchers used Cochran's Formula for finite population to determine the sample size, and based on the computation, the sample size needed was 232 students. Since, there are 12 sections that is considered as strata, the researchers get the proportion per strata then multiplied by the computed sample size, then respondents were randomly selected per strata.

Table 1 reveals the assessment of the respondents in the level of difficulty to Challenges in transitioning to Flexible Learning. It shows that overall, it is Difficult for the respondents to have a Self-Paced Learning, specifically it is difficult for them to: analyze and understand the learning materials given, achieve the goals and objectives on every module given, and answer the tasks after reading the learning materials. However, table 1 shows that it is Easy for the respondents to Submit on Time because they were given enough time by their professors to finish their tasks and projects. Lastly, respondents assessed that it is Moderate in terms of Self-Motivation, because in some way the transition to distance learning helped them to be more motivated in studying, and they were able to set goals and deadlines for themselves.

Table 1. Level of Difficulty to Challenges in transitioning to Flexible Learning

Challenges	Overall Median	Verbal Interpretation
Self-Paced Learning	4	Difficult
Submission Timeline	2	Easy
Self-Motivation	3	Moderate

Table 2 reveals the assessment of the respondents in the level of agreement to Barriers encountered in transitioning to Flexible Learning. It shows that overall, respondents were Disagree about the Convenience in Performing Laboratory Activity, because the desired tools and equipment for their laboratory were not able to their home. In terms of Available Devices, respondents assessed that they are Agree because they have at least 1 device that they can use to keep up in distance learning. While in terms of Communication with Instructors, the respondents assessed that they are Neutral, because not as frequent their professors were able to answer their concerns on time. Lastly, in terms of Internet Connectivity, the respondents assessed that they are Strongly Disagree, because with their current Internet Source, they can't access fast internet connection and they can't be able to attend synchronous sessions regularly.

Table 2. Level of Agreement to the Barriers encountered in transitioning to Flexible Learning

Barriers	Overall Median	Verbal Interpretation
Convenience in Performing Laboratory Activity	4	Disagree
Available Devices	2	Agree
Communication with Instructors	3	Neutral
Internet Connectivity	4	Strongly Disagree

Table 3 shows the testing of significant impact of the Barriers encountered in FL to the Self-Paced. Since the p-value of Available Devices (0.000) is less than 0.05 level of significance, thus, the researchers' decision is to Reject Null Hypothesis. Therefore, the researchers' concluded that Available Devices has a significant impact to the Self-Paced Learning.

Table 3. Significant Impact of the Barriers encountered in FL to the Self-Paced Learning

Self-Paced Learning vs.	Spearman's Rho	P-value	Decision	Conclusion
1. Convenience in Performing Laboratory Activity	0.072	0.273	Fail to Reject Ho	Not Significant
2. Available Devices	0.338	0.000	Reject Ho	Significant
3.Communication with Instructors	-0.071	0.279	Fail to Reject Ho	Not Significant
4. Internet Connectivity	-0.067	0.306	Fail to Reject Ho	Not Significant

Table 4 shows the testing of significant impact of the Barriers encountered in FL to the Submission Timeline. Since the p-value of Available Devices (0.002) and Internet Connectivity (0.000) are less than 0.05 level of significance, thus, the researchers' decision is to Reject Null Hypothesis. Therefore, the researchers' concluded that Available Devices and Internet Connectivity have a significant impact to the Submission Timeline.

Table 4. Significant Impact of the Barriers encountered in FL to the Submission Timeline

Submission Timeline vs.	Spearman's Rho	P-value	Decision	Conclusion
1. Convenience in Performing Laboratory Activity	0.069	0.287	Fail to Reject Ho	Not Significant
2. Available Devices	0.198	0.002	Reject Ho	Significant
3.Communication with Instructors	0.112	0.085	Fail to Reject Ho	Not Significant
4. Internet Connectivity	0.226	0.000	Reject Ho	Significant

Table 5 shows the testing of significant impact of the Barriers encountered in FL to the Self-Motivation. Since the p-value of Available Devices (0.011) is less than 0.05 level of significance, thus, the researchers' decision is to Reject Null Hypothesis. Therefore, the researchers' concluded that Available Devices has a significant impact to the Self-Motivation.

Table 5. Significant Impact of the Barriers encountered in FL to the Self-Motivation

Self-Motivation vs.	Spearman's Rho	P-value	Decision	Conclusion
1. Convenience in Performing Laboratory Activity	0.026	0.687	Fail to Reject Ho	Not Significant
2. Available Devices	0.027	0.677	Fail to Reject Ho	Not Significant
3.Communication with Instructors	0.082	0.210	Fail to Reject Ho	Not Significant
4. Internet Connectivity	0.165	0.011	Reject Ho	Significant

Table 6 shows the testing of significant difference in the level of agreement to the Barriers encountered in FL in terms of students' section. Since the p-value of Convenience in Performing Laboratory Activity, Available Devices, Communication with Instructors, and Internet Connectivity are greater than 0.05 level of significance, thus, the researchers' decision is to Fail to Reject Null Hypothesis. Therefore, the researchers' concluded that there is no significant difference in the level of agreement to the Barriers encountered in FL in terms of students' section.

Table 6. Significant Difference in the Level of Agreement to the Barriers encountered in transitioning to Flexible Learning in terms of Section

In terms of Section	H-value	P-value	Decision	Conclusion
1. Convenience in Performing Laboratory Activity	1.295	0.999	Fail to Reject Ho	Not Significant
2. Available Devices	4.657	0.937	Fail to Reject Ho	Not Significant
3.Communication with Instructors	1.643	0.989	Fail to Reject Ho	Not Significant
4. Internet Connectivity	1.378	0.999	Fail to Reject Ho	Not Significant

Table 7 shows the testing of significant difference in the level of difficulty to challenges in transitioning to Flexible Learning in terms of students' section. Since the p-value of Self-Paced Learning, Submission Timeline, and Self-Motivation are greater than 0.05 level of significance, thus, the researchers' decision is to Fail to Reject Null Hypothesis. Therefore, the researchers' concluded that there is no significant difference in the level of difficulty to challenges in transitioning to Flexible Learning in terms of students' section.

Table 6. Significant Difference in the Level of Difficulty to Challenges in transitioning to Flexible Learning in terms of Section

In terms of Section	H-value	P-value	Decision	Conclusion
1. Self-Paced Learning	4.660	0.947	Fail to Reject Ho	Not Significant
2. Submission Timeline	9.034	0.619	Fail to Reject Ho	Not Significant
3.Self-Motivation	4.630	0.948	Fail to Reject Ho	Not Significant

Summary of Findings

To sum up, the researchers aim to determine the Barriers and Challenges encountered by the 1st Year BSIE students in Quezon City University. Based on the analysis, findings revealed that:

1. Overall, 1st year students find it difficult in transitioning to Self-Paced learning. But they it Easy and Moderate for them in terms of Submission TimeLine and Self-Motivation, respectively.
2. Overall, the respondents assessed that they are Disagree about the convenience in performing laboratory activity, and they are Strongly Disagree about having a fast inter connection. However, the respondents assessed that they are Agree that they have at least 1 device to keep up in distance learning. But they are Neutral about the communications with their instructors.
3. Based on the result, the Available Devices has a significant impact to the Self-Paced Learning and Submission Timeline. Moreover, the Internet Connectivity has a significant impact to the Submission Timeline and Self-Motivation.
4. Lastly, based on the results, the researchers determined that there is no significant difference in the level of difficulty to challenges and barriers in transitioning to Flexible Learning in terms of students' section.

Acknowledgement

The researchers would like to express their heartfelt appreciation to the students who serve as their respondents for this study. To the QCU management, thank you for sharing your expertise, and recommendations for the enhancement of this research. And to Almighty God, who guides and protects us during this time of pandemic.

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Stress, Study Habits and Academic Performance of Management Students of Cavite State University (CVSU) - Carmona Campus During the Flexible Mode of Learning

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Abstract - The study aimed to determine the relationship between the stress level, quality of study habits and academic performance of the CvSU Carmona students under the Department of Management (DM). Descriptive correlational research design was used with a total of 396 Bachelor of Science in Business Management (BSBM) and 145 Bachelor of Science in Hospitality Management (BSHM) students. Results showed that both BSBM and BSHM students have high level of stress in terms of school-related affairs and matters about their body, mind and feelings. It displays that most of the students are emotionally and physically drained since most feel that they are not confident if they will be successful in the program, thus they are pressured, have dilemma in the sleep pattern and lose weight while studying. Study habits of the students were good in terms of their motivation to study, organizing and planning their work, working with others, utilizing resources and feedback and in note-taking and reading. This led BSBM students to a very good academic performance having a GPA of 1.94 while 2.08 for BSHM students interpreted as good. No significant relationship occurred between the level of stress and study habits of the students as correlated to academic performance. Generally, it can be proposed that CvSU-Carmona management students are quite stressed in coping up with the demands of their college life but has an acceptable strategy of studying to cope up with it. Yet, even in this pandemic, stress does not directly affect their academic performance.

Keywords - academic performance, stress, study habits, flexible mode of learning, GPA

Introduction

The biggest challenge for year 2020 was the news about a toxic novel virus, Corona Virus, known as CoViD 19, which shocked the whole world. This virus can be spread through droplets and particles released by infected people through sneezes, coughs and breathes. Countries were affected economically and there was social commotion all over the world. On March of 2020, when several confirmed acquisitions of the virus and deaths with it came, Philippines' President Duterte announced that the entire Luzon shall be placed into an enhanced community quarantine (ECQ) until April 15 (www.officialgazette.gov.ph). Since cases continuously occurred and cure was not yet obtained, lockdown was still extended and the end of it is yet unknown. This pandemic brought closure of offices, both private and government with only essential people allowed to go out to provide the necessities of most people. This closure affected much the education system too. As dela Fuente et.al (2021) also said, that COVID-19 pandemic have required an enormous modification in the university teaching–learning processes. This change from the face to face arrangement to the flexible mode of learning in providing learning for students, brought stress and mental health consequences both to students and educators (Chandra, 2020).

Since the pandemic incidence, several studies were done in the different fields of education to be able to assist the student in this so-called educational transformation. Ahern and Norris (2011) believe that changes from the ordinary used set up leads to stress for university students. Few studies on the relationship of this stress and remote learning was done especially associating the factors to the academic performance (Yang, Chen and Chen, 2021). On the other hand, study habits are the way students face their everyday school activities to be able to cope with some academic tasks. Study habits are understood to contribute significantly in the acquiring of knowledge and capabilities of an individual. Even the World Health Organization suggests that that students must be physically and emotionally equipped to be able to do well in education (as cited by Pascoe, M., Hetrick, S. & Parker, A., 2020). Even in this pandemic, educational institutions still would like to consider the welfare of students while continuously moulding their minds in their own chosen field. This led the researchers to further determine the status of the management students in Cavite State University – Carmona Campus, Cavite to be able to do some interventions as necessary. The objectives of this study are to determine the level of stress of the students of the management students in terms of school-related factors; relationship; and body, mind and feelings; the quality of study habits of the students in terms of motivation; organizing and planning; working with others, utilizing resources and feedback; and note-taking and reading; the level of their academic performance and the relationship of the level of stress factors and academic performance and the quality of study habits facets and the students' academic performance

Methodology

A combination of descriptive and correlational research designs was used to in the study. Descriptive was utilized to obtain the level of stress, study habits and the academic performance of the participants while correlational was for the relationship of these variables. Participants of the study were 396 Bachelor of Science in Business Management (BSBM) and 145 Bachelor of Science in Hospitality Management (BSHM) students of the Department of Management of Cavite State University-Carmona Campus. Stratified random and proportionate sampling techniques were adapted to gather the student participants thru the help of Registrar of the campus. The instrument for the level of stress was from the standardized questionnaire of Barreca and Kepler (2020). Meanwhile, for the level of quality of the students' study habits was adopted from the works of Bulusan, et al. (2019) in his book Facilitating Learner-Centered Teaching. Academic performance was obtained from the general point average (GPA) of the students during the 2nd semester of A.Y. 2020-2021. Weighted mean, standard deviation and chi-square test were utilized to measure the relationship of the said variables.

Results and Discussions

Results show that most of the participants of BSBM and BSHM programs have a high stress in terms of school-related and body, mind, feelings issues while low stress in terms of their relationship. It shows that management students are emotionally and physically drained with the demands of their school, money concerns, and dilemma in their bodies and mind or mental health. Same resulted from Rotas and Cahapay's (2020) study that due to this remote learning this pandemic, college students felt overloaded with their school activities which brought conflict with their home responsibilities. Most also have financial related problems and poor learning environment. With all this their physical health is also affected. Yang, Chen and Chen (2021) also considered that academic workload and separation of students from the physical school brought negative effect on the health of college students due to stress. It displays that this flexible mode of learning led to a huge consequence on the emotional and physical facets of the college students. It is yet a good thing to consider that they are not having relationship problems, probably because technology have bonded people in a more unique way than people used to do during face to face. Students now uses different ways of communicating to other students like using social media applications or just merely dropping phone calls. Gabbiadini et. Al. (2020) mentioned that technology available nowadays allowed people to stay in contact with others in very contemporary ways. from virtual happy hours with friends to religious services.

Consequently, the level of study habits in terms of motivation, organizing and planning, working with others, utilizing resources and feedback and note taking and reading aspects of BSBM students were all interpreted as good with mean scores of 2.81, 3.06, 2.81 and 2.92 respectively. Hospitality management students also resulted to good study habits in of those facets with weighted mean scores of 2.77, 3.02, 2.80 and 2.91 respectively. This reveals that generally, the management students are motivated to study and does not have a problem keeping unto it. Moreover, they are organized and plan ahead for their schools' tasks, they can still relate well with others and knows how to utilize resources and their reading and note taking skills are good enough to support their educational needs. Moreover, business management students gained an average of 1.94 GPA interpreted as very good, while hospitality management students have 2.08 GPA interpreted as good. Both groups presented that they can greatly deal with their studies and copes with or still accomplish different tasks given to them by their teachers (Table 1).

Table 1. Level of Stress, Study Habits and Academic Performance of Business Management and Hospitality Management Students

	Business Management		**Hospitality Management**	
	Mean	**Interpretation**	**Mean**	**Interpretation**
	Level of Stress			
School-Related	2.86	High	2.86	High
Relationship	1.82	Low	1.88	Low
Body, Mind, Feelings	2.67	High	2.68	High
	Level of Study Habits			
Motivation	2.81	Good	2.77	Good
Organizing and Planning	3.06	Good	3.02	Good
Working with Others, Utilizing Resources and Feedback	2.81	Good	2.80	Good
Note Taking and Reading	2.92	Good	2.91	Good
	Academic Performance			
	GPA	**Interpretation**	**GPA**	**Interpretation**
Academic Performance	1.94	Very Good	2.08	Good

Moreover, Table 2 shows that the results of the level of stress brought about by the school-related, relation and body, mind and feelings conditions are not significantly related to the academic performance of both groups of management students with p values of higher than 0.05. This shows that the students may have high stress in some aspects yet it does not have anything to do with the academic performance. It just shows that they can still cope up and deal with the big change that happened to the mode of learning during this flexible mode or remote learning. Khan, Altaf and Kausar (2013) found that academic stress affects student performance because during the semester of their study, students have to finish school-related tasks yet are required to finish a lot of modules on a less period of time. Oketch-Oboth and Okunya (2018) also mentioned that a significant relationship occurred between stress level and academic performance students of several programs in University of Kenya for those within 19 to 22 years, 23 to 26 years, either male or female. This was somehow contrast to the result of Pascoe, Hetrick and Parker (2020) who mentioned that academic-related stress that their student participants experience created a major factor their academic achievement. The higher the stress is, the lower the academic achievement students will have.

No significant relationship was also posted between study habits of the management students and their academic performance. For business management students, with p values of 0.769, 0.342 and 0.552 respectively for the relationship of school-related, relationship and body, mind, feelings and the academic performance through the GPA of the students, it shows that all these factors does not have anything to do with their academic performance. No significant relationship between these variables also occurred with the hospitality management students with p-values of 0.614m 0.684 and 0.299 respectively

Table 2. Significant relationship of Stress and Study habits of Business Management and Hospitality Management Students and their Academic Performance

	Business Management (BM)			**Hospitality Management (HM)**		
	Chi	**p-value**	**Remarks**	**Chi**	**P-Value**	**Remarks**
Relationship of Level of Stress and Academic Performance						
Relationship & Academic Performance	92.805	0.342	Not Significant	61.935	0.684	Not Significant
Relationship & Academic Performance	92.805	0.342	Not Significant	61.935	0.684	Not Significant

Body, Mind, Feelings & Academic Performance	130.448	0.552	Not Significant	109.038	0.299	Not Significant
Relationship of Level of Study Habits and Academic Performance						
Motivation and Academic Performance	79.699	0.724	Not Significant	36.060	0.372	Not Significant
Organizing & Planning and Academic Performance	101.371	0.156	Not Significant	83.505	0.097	Not Significant
Working with Others, Utilizing Resources & Feedback and Academic Performance	82.336	0.650	Not Significant	86.743	0.062	Not Significant
Note Taking & Reading and Academic Performance	75.804	0.820	Not Significant	79.513	0.160	Not Significant

Conclusion and Recommendations

To conclude management students of CvSU Carmona have high stress in terms of school-related and body, mind and feelings concerns while low in terms of relationship. They are somehow affected with the flexible learning used by all educational institutions because of the pandemic yet they are mainly assisted by the different methods of technology to communicate with one others. It was also identified that they have good study habits in terms of motivation, organizing and planning, working with others, utilizing resources and feedback and with notetaking and reading aspects. Business management students have a very good academic performance while hospitality management students have good academic perforamnce. With this, it is convenient to know that these management students can still manage to cope with the demands of the faculty members of their programs even if stress is high on the part of the school-related and body, mind and feelings concerns. Consequently, o significant relationship occurred between the said variables. Thus, their stress level and study habits does not directly have an effect in their academic performance.

With these inferences, it is recommended that the school administration be able to provide some interventions to lower the stress of the students so to lessen their burden in terms of student activities and body, mind and feelings concerns. Also, the department may provide additional tips in the form of webinars or announcement that would maintain their good study habits and even support them have an excellent one.

Acknowledgement

The authors would like to acknowledge the invaluable participation of the management students of the campus in the conduct of this study. This will not also be possible not without the help of the student leaders per class who assisted in tapping and encouraging other students to participate. Grateful acknowledgement also goes to the campus administrator and few faculty members who were asked to support this study and create a larger scope of this research. Definitely all glory goes to God Almighty for making this endeavor possible in a short period of time.

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Non-Mathematics Major Students' Perception, Mathematics Performance, and Experiences in Learning Mathematics Online Through Videos

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Abstract - This embedded mixed-method research aimed to determine the effect of using videos to the mathematics performance of non-mathematics major first-year college students. It also sought to describe their perception of mathematics learning in the new normal and experiences on the use of videos in online mathematics learning. The methods used were researcher-made tests on mathematics performance, asynchronous online FGD, observation, and open-ended questions. Data analysis tools employed for quantitative data were mean, standard deviation, Shapiro-Wilk test (normality), and Wilcoxon Signed-Rank test all processed through SPSS. In addition, thematic analysis was used to analyze qualitative data. The study revealed that the performance of the students after the use of videos in online mathematics learning is higher than before its implementation. Students perceived mathematics learning online in the new normal as challenging, but they are willing to learn; interesting and exciting, and meaningful amidst the crisis. Furthermore, the students' experiences on the use of videos in learning mathematics online exemplified that the videos were easy to understand, flexible, have implied the social presence of the teacher, and suited to new normal learning. It is also worthy to note that a significant difference was found in the performance of the students before and after the use of videos in learning mathematics online in favor of the performance after the intervention. Teacher-created videos are indeed effective in helping the students to reflect on their learning progress through self-assessment as one of the features of the videos, making mathematics learning flexible in terms of time and place, personalizing mathematics learning through the social presence of the teacher, simplifying mathematical concepts through comprehensive discussions, and instigating students' interests that mathematics can be fun.

Keywords - Mathematics Performance, Perception of Online Learning, Learning Experiences in Using Videos, New Normal Mathematics Learning, Teacher-created Videos

Introduction

In the past years, majority of the learning process of the students was through classroom setting or face to face interaction. Teachers used to deliver their lessons through face to face lectures, interactive activities, live discussions, hands - on practicum, and the like. However, the pandemic posed an excellent opportunity to change the way we teach mathematics in schools. Because of the pandemic, education had to migrate to the online environment (Delgado, 2020). The Commission on Higher Education (CHED) advised institutions of higher education in the Philippines to implement distance education methods of learning for its classes, such as the use of educational technology, to maximize the academic term despite the suspensions (Hallare, 2020). Online learning is education that takes place over the Internet. Online learning is just one type of distance learning for any learning that takes place across distance and not in a traditional classroom. It gives students greater access to education in comparison to traditional methods of teaching as students can undertake their study from anywhere and at any time (Ariyanti & Santoso, 2020).

Furthermore, based on the study of Tyaningsih et al. (2021), after the surveys and online interviews through Google forms and Google meetings on what the students thought about online learning, some of the advantages of online learning were practical (easy to use), flexible (can be done anywhere and anytime), and can be done casually (while lying down, eating, drinking, etc.). To add, Villanti, et al. (2017) advanced that most of the students perceived that they were capable to attend online or distance learning and see that it is the same with actual classroom setting despite having differences in mathematical ability and regardless of their owned electronic gadgets, quality of internet connection and mean to connect in the internet.

Though e-Learning has been slowly being a part of the medium of instruction in the Philippine education, challenges have been evident on the use of it especially in Mathematics courses (Cortez, 2020).

The study of Ariyanti & Santoso (2020) in Indonesia on online mathematics learning prior and after the pandemic found out that the average student's positive response towards mathematics before online learning is greater than after online learning. Obstacles faced by students when participating in online learning include the issue on the teacher who directly gives questions without any material explaining how to solve problems making the students unaware on how to understand the material. Another study among dental students in an Asian university by Amir et al. (2020) showed that more students felt lower learning satisfaction and more difficult communication either with instructors or with peer students in doing distance learning. Internal factors and difficulty to stay focused for long online learning duration were reported. In the Philippines, the study of Guansi et al. (2020) among college students found out that students still prefer the learning process where the teacher explains the lessons followed by an assessment. This indicates that students can make their learning process through learning resources, however with the explanation of the teacher via online. It is still important for them that teachers discuss their lesson for them to understand deeply the subject matter.

Considering these gaps in pedagogy and learning resources in higher education in the Philippines and other countries on how to make learning in the new normal effective, inclusive, flexible, and efficient, many studies suggested the use of instructional videos in mathematics education and other fields. Ariyanti & Santoso (2020) found out that the students prefer online mathematics learning where teachers should make videos or explain material through videos so that students can better understand completion steps and formulas that can be used. Tanujaya et al. (2021) also concurred the use of video in an effort to increase interaction between teachers and students in learning. Teachers need to make more innovative approaches to achieve the learning objectives of mathematics instruction. Wang (2021) on his study in an online undergraduate math course revealed that students improve much more in test performance when using fewer technologies and tools like videos and forums. An appropriate number of pre-lecture and lecture videos are in need to assist students with academic improvement.

Moreover, regardless of the challenges, it was obvious that the production and consumption of videos is exploding. In 2014, Pai reported that videos are considered a most powerful medium of learning. Allison (2015) found out that teachers use videos to reinforce, to motivate, and to provide authentic content. According to teachers, the advantages of using instructional videos are maximizing instructional time, using multi-modal instruction, and fostering motivation. However, previous studies on the use of videos in mathematics education and other fields presented varied findings and results. For Sharma (2018), the mathematics achievement of the classes receiving consistent exposure to videos and real-life activities was greater than classes receiving only some of the special instructional treatments. Students interviewed believed that instructional videos and real-life activities improved their understanding of the mathematical concepts involved in the study. To Wang (2021), it is surprising that the higher the number of videos watched, the lower the degree of improvement is seen in standardized testing. Considering this reflection, the content and organization of videos should be adjusted to accommodate only key theorems and questions without overlapping materials. According to Capuno et al. (2019), with the conclusion that there is no significant relationship between instructional media utilization and the academic performance of the respondents, it opened another avenue of intellectual discourse of the effectivity of technology among learners of a developing country like the Philippines.

Hence, this study came to life to address the empirical gaps on the effect of instructional videos to the mathematics performance of the students situated in an online context during the pandemic and ascertain if teacher-created videos are effective materials for optimum mathematics performance in the new normal. Moreover, students' perceptions on learning mathematics in the new normal would also manifest what it means for them to learn amidst the crisis. Their experiences on the use of teacher-created videos would further validate the quantitative data on the effect of videos to their mathematics performance.

Methodology

This study employed embedded mixed method research design. A broader range of research questions can be examined because the researcher is not confined to a single method. Mixed methods research can provide stronger evidence for a conclusion through corroboration of findings. The researcher may have insights that could have been missed with only a single method (Ary et al., 2010).

According to Ary et al. (2010), in an embedded design, one form of data supports a second form of data within a single study. The rationale for an embedded design is that a single data set is not sufficient to answer different questions, and each type of question requires different types of data. The hallmark of an embedded design is that the different data sets are mixed at the design level rather than in the conclusions so that one of the data sources is relegated to playing a supplemental role to the prominent data source. This design was fitted to this study because its primary goal is to determine the effect of teacher-created videos to the mathematics performance of the three groups of non-mathematics major students. Qualitative data were also solicited through asynchronous focus group discussion (FGD), online observation, and open-ended question to corroborate and supplement the findings on the mathematics performance before and after the use of teacher-created videos.

Moreover, the participants of the study were 129 first year non-mathematics major college students from a State University in Western Visayas who were selected through cluster sampling. These three group of students are taking Mathematics in the Modern World (MMW), a general education subject in the Higher Education curriculum, during the conduct of the study. One group consisting of 24 students were included in the asynchronous FGD through Facebook Social Learning group to identify their perceptions on mathematics learning in the new normal. Sixteen (16) students also responded to the open-ended question about their experiences on the use of teacher-created videos through Google Form and FB Messenger Group. Students' pseudonyms were used in the discussion of the qualitative data to ensure anonymity and confidentiality of identities.

In terms of data gathering methods and procedure, the researcher utilized a 50-item researcher-made test on mathematics performance which was validated by experts and was found reliable using Kuder-Richardson 20 (KR 20 = .87). A table of specifications (TOS) was done before the test construction to ensure content validity. The original number of items in the test was 70 but after the item analysis and reliability analysis, it was reduced to 50. The FGD and open-ended question were also validated by experts. Furthermore, the researcher administered the test on mathematics performance at the start of the second semester AY 2020-2021 by February through Google form. A total of eight (8) teacher-created videos ranging from 30-40 minutes per topic/video were uploaded in the YouTube account of the researcher. During the implementation, the researcher used the videos as asynchronous lecture materials covering eight selected topics from chapters 1-4 in MMW. One video package was utilize per week as a lecture material with integrated assessment within the video, hence, the implementation lasted for eight (8) weeks also. The unified parts of the videos were the following: title, learning objectives, overview, discussion with integrated self-assessment, and references. The link of the videos were posted in the FB Social Learning Group of the three groups of non-mathematics major students for them to view the videos in their most convenient time within the week. Sample activity sheets were also provided for them to practice the knowledge that they've learned from the videos.

Moreover, descriptive statistics namely mean and standard deviation were employed to determine the mathematics performance of the students before and after the use of teacher-created videos. A Shapiro-Wilk test was also performed to identify the normality of the distribution of the difference in test scores on mathematics performance before and after the use of teacher-created videos. After finding out that the distribution of the difference of scores was not normally distributed, Wilcoxon Signed-Rank test was used to compare the performance of the students before and after the implementation of videos. All of these statistical analysis techniques were processed through SPSS. On the other hand, thematic analysis was used to analyse qualitative data on the asynchronous FGD and open-ended question.

Results and Discussions

Students' Perception of Learning Mathematics in the New Normal

One group of non-mathematics major students, 24 of them, were included in the asynchronous online focus group discussion (FGD) regarding their perceptions of learning mathematics in this new normal. They were allowed to use their mother tongue or native language so that they can express their thoughts better but majority of them answered in English. After the asynchronous online FGD, the researcher conducted a thematic analysis of their responses which came up with three themes namely: challenging but willing to learn; interesting and exciting; and meaningful amidst the crisis.

Challenging but Willing to Learn. Most of the participants shared a common idea that mathematics learning in the new normal is challenging and difficult. This point of view might have been influenced by their not so good experiences in mathematics classes before. In addition, they might have an innate anxiety and fear in numbers or mathematics. This was supported by what Student 1, Student 2, Student 3, and Student 4 have shared.

> *Student 1: "I am not that fond in this subject which is Mathematics and it is my least favourite subject because ever since, I find it really difficult unlike other subjects that I can still cope with. I really hope to learn more and have a better understanding with this subject and I am looking forward into it."*

> *Student 2: "I can see that this subject would be hard for it is math, my weakness. But this time, I will face my fear to learn and to survive."*

> *Student 3: "Honestly, math has been my weakness since high school, I'm one of those students who get anxious every time I am asked to answer a problem or solve an equation."*

> *Student 4 further added that: "Actually I'm not a good in this subject because it's difficult for me."*

However, despite the negative perceptions of the students regarding learning mathematics in the new normal, they are still willing and open to explore the possibilities of loving it and making the most of their learning experiences. This was highlighted by Student 5, Student 6, and Student 7.

> *Student 5: "I can sense that this subject is difficult but I am willing to gain knowledge and understand the importance of Mathematics."*

> *Student 6: "My expectation in this subject is that it will be difficult to understand some lessons while learning but despite the difficulties I am willing to obtain new knowledge and acknowledge the importance of Mathematics everywhere."*

> *Student 7: "I also like encoding, helping my parents and understanding social studies through surfing it online as my idle time. But in this subject, I think it would be reading barcodes without translation. Difficult but still willing to learn."*

Furthermore, some of the participants have a low self-esteem in terms of mathematics, numbers, problem solving, and analysis. These doubts on their dispositions of mathematics are also significant factors contributing to their perception of mathematics learning in the new normal as difficult and challenging. This was exemplified by views of Student 8, Student 9, and Student 10.

> *Student 8: "I know that this subject is more challenging because it talks about resolving numerical values and properties and I know that I have only enough ability to comprehend those things."*

> *Student 9: "Honestly I'm having a hard time with mathematics because I'm a slow learner."*

Student 10: "It's really challenging especially in analysing a problem, my weaknesses when it comes in analysing."

This confirms the findings in the study of Kiss & Vukovic (2017) that mathematics anxiety is a widespread problem; it is very common to hear people say, "I am not a math person" or "Math makes me nervous". Dowker, et al. (2016) reported that, based on numerous studies, anywhere from 2% to 68% of students have mathematics anxiety. Gautreau, et al. (2016) noted that negative stereotypes and prior learning experiences are two of the prevalent factors that influence mathematics anxiety and attitude. Their research has also recommended that anxiety towards mathematics should be reduced to improve attitudes towards mathematics, and this can be encouraged by hands-on learning and a problem-solving approach in which students work in groups to construct knowledge. Hence, teacher-created videos were used in this study to assist the students in learning mathematics online and consequently reduce their anxiety in mathematics. In addition, the study of Ariyanti & Santoso (2020) in Indonesia on online mathematics learning prior and after the pandemic also attests the findings above that the students find this new normal way of learning as challenging. In their study, the average student's positive response towards mathematics before online learning is greater than after online learning.

Interesting and Exciting. On the other hand, it is also worthy to note that some of the students are still excited to learn and explore mathematics despite of the difficulties fostered by the new normal education. The students expressed the idea that mathematics learning in the new normal can still be fun, interesting, and enjoyable. Since majority of the students belong to generation Z, the perception of having an exciting and interesting mathematics is not new through various engaging activities which can make it more fun. This is evident to the responses of the following students.

Student 10: "I hope that math will be enjoyable even though it's really challenging especially in analysing a problem."

Student 11: "I love math but the subject hates me. I'm not that good in mathematics but may I enjoy and feel the excitement in solving math problems in this new normal."

Student 12: "I expect that I can learn a lot from Mathematics in the Modern World. I also wish that they have fun exciting activities."

Student 13: "I think it is an interesting subject and maybe I can know more about it and learn new knowledge."

Student 14: "I hope this subject will help me realize that math is enjoyable and not something to be scared of."

Student 15: "I wish more fun in learning Mathematics."

Student 16 seconded her statement, "although there are obstacles and difficulties in studies right now due to this pandemic which hindered everyone to go face-to-face, still I am expecting having fun in this subject."

To add, some of them considered mathematics as one of their favourites though they are non-math major students.

Student 17 explained that "Mathematics is one of the subject that most people got scared of because they say it is difficult but for me it is fun. Since HUMSS only have 2 subjects that is related to math, I do not know if I still remember on how to solve mathematical problems but this was my favourite subject back when I was Junior High School. I believe that learning this subject also depends on the ones who is teaching. I expect that we'll be able to enjoy this subject and be able to learn a lot."
Student 18 further added, "Mathematics is one of the things that can easily hook my attention, it truly excites me thinking that I will get in touch again with this subject. I expect that it tackles more about the nature of

Mathematics, basically its roots, and how to apply it in other aspects. Thus, I hope that the months we're be fulfilling will be lots of fun and learnings."

These statements support the findings of Cox (2017) that students prefer technology because they believe that it makes learning more interesting and fun. Subjects that students deem challenging or boring can become more interesting with virtual lessons, through a video, or when using a tablet.
This also concurs with the findings of Villanti et al. (2017) that in n the modern era where almost everything can be done online, this follows that the type of students schools are catering right now can be tech savvy and technologically literate. This is with the fact that the young generation, including young adults, do have increasing access and activity on the internet and the social media. Hence, learning can still be fun and exciting in the new normal with these techno-savvy learners.

Meaningful Learning amidst the Crisis. Furthermore, the participants also advanced the idea that despite the pandemic, their expectation and perception of learning mathematics in the new normal embody positivity. This may be one of their ways to alleviate the struggles of this new normal education. Majority of them perceived that they can still gain comprehensive understanding and relevant knowledge in mathematics for practical usage and meaningful learning amidst the pandemic.

Student 18 explained that, "We are still in the middle of this pandemic health crisis and educating students and learning from the teachers is very difficult. I expect effective modes of learning even we are not in a classroom proper which will help us learn more things about the subject matter."

Student 19 cited that, "My expectation to this MMW is to gain more knowledge, to learn and discover new learnings about this subject. Hoping that this subject will be more interesting to me and help me to understand and also this subject is easy. Also I can easily understand even though we are in this setup."

Student 20 further added that "I can feel that this subject will motivate me to learn more that can increase the knowledge I've learned before and help me to solve different problem that was related to math that I can also apply in real life."

Student 21: "I perceive that this subject will widen my ideas about Mathematics. To be able to solve complicated problems, perform the right solutions, apply the appropriate formulas and many more. I expect that this subject will make me love Mathematics and see the beauty in it even though we are facing a new normal mode of learning. It will not become a hindrance to understand the lessons and will serve as a challenge to make us learn."

Student 22: "I expect to learn the importance and use of mathematics in our daily lives in the modern world."

Student 19: "My expectation about this subject, I expect to gain knowledge that can help me improve my math skill that I can use for future reference."

Moreover, some of the participants also perceived a simple, guided, meaningful, and easy to understand mathematics content and delivery in the new normal for optimal learning.

According to Student 23, "my expectation from this subject is easy and simple. Hoping that it can give us better understanding about the topics and can guide us throughout this journey especially in this hard times."

Aside from being easy to understand, Student 24 also pointed for a meaningful mathematics takeaways, "I wish that it will be easy for us to understand our lesson because of our good teacher. I hope that by the end of this semester, what we have learned will imprint in our minds and be used in the next steps towards our success."

Based on the study of Cortez (2020), with the diversity of the socio-economic status of the students, it shows that 73% of the students said that they have the ability to comply with distance learning which can be the new normal of the Philippine education since 2020 due to the existing threat of CoViD-19. Whatever status they have in life, it doesn't affect their view and perception of their capability of doing distance learning. This results from the study of Cortez (2020) depicts that students still perceived a meaningful learning experience in the new normal despite the crisis.

Mathematics Performance of the Students Before and After the Use of Teacher-created Videos in Learning Mathematics Online

Table 1. Difference in the Mathematics Performance of the Students Before and After the Use of Teacher-created Videos in Learning Mathematics Online

	N	Median	Z	Sig.
Before	129	18	-9.055	.000
After	129	29		

A Wilcoxon Signed-Rank test result shows that there is a significant difference in the mathematics performance of the students at .05 level of significance before (Md = 18) and after (Md = 29) the use of teacher-created videos in learning mathematics online in favour of the performance after the video intervention (Z = -9.055, p = .000). It implies that teacher-created videos are indeed effective in improving the performance of the students in learning mathematics online in the new normal.

This result agrees with the study of Lloyd and Robertson (2012) whose study found that the students taught with the screencast tutorials scored significantly better than the students taught with the traditional instructional techniques. In addition, in the study of Sharma (2018), the evidence suggests that the instructional video and real-life activity assisted instruction does make a statistically significant difference in students' mathematical achievement. The results indicated a statistically significant difference (α = 0.5) between the mean post-test score of students taught by instructional video assisted instruction and the students taught by traditional methods. Sharma (2018) conclude that both instructional video and real-life activity, individually as well as combined, affect students' mathematical achievement.

However, it deviates from the study of Wang (2021) that the higher the number of videos watched, the lower the degree of improvement is seen in standardized testing.

Students' Experiences on the Use of Teacher-created Videos in Learning Mathematics Online

When these non-mathematics major students were asked about their experiences on the use of videos in learning mathematics online, their responses present the idea that the videos were easy to understand, flexible, with implied social presence of the teacher, and suited to new normal learning. The students were allowed to answer in their mother tongue or native language so that they can express their thoughts better. After administering the open-ended question and online observation, the researcher conducted a thematic analysis of their responses. English translations were provided in the discussion for those answers of the students based on their native languages.

Easy to Understand. The answers of the students boil down to the idea that the videos utilized in class are easy to understand learning material. Since the videos were personally made by the teacher, a detailed, guided, and informative discussion was presented in the videos to meet the objectives of a particular lesson. The clarity of the discussion was also considered by the students as a significant part why the videos were easy to understand.

Student A stated that, "Videos gave us a better view and understanding about our lesson on math, it became our guide in easy learning the topic and finding some sort of ideas in solving the activity. And it made me/us more knowledgeable about the concept of this subject. Video became our guide and way to correct our output/ activity."

It was also validated by Student B and Student C who cited that "My experience about watching videos helped me to easily understand the lesson. It's really a big help for me to analyse the problem because when the teacher is explaining through video, it gives me a clear explanation and knowledge on how the problem will be solved."

Student C: "As I've watched the videos, my experience about it was memorable because the videos gave me a sense of excitement in answering the activities you've given. It helps me easily understand the ways on how to solve the problem."

Furthermore, the students find the videos in the material simple, comprehensive, effective, and easy to understand as agreed by Student D and Student E.

Student D further added, "Easy and interesting sir, kasi ano sir… mahambae ko nga easy kasi kung tutuusin abi sir hay mas madali akong makaeubot kato sa video kaysa sa ginadiscuss it teacher sir…" (It was easy and interesting because actually, I can comprehend easily the video compared to the actual discussion of the teacher…).

Student E said that, "Video is very beneficial and effective educational material for me because it is comprehensible, understandable, and composed of various examples. It is good for those students who cannot easily understand and catch up a certain topic fully like me because it gives me a chance to study it again. The efforts of putting some pictures, voice over, and the smooth transitions of effects are also helpful in learning the discussion very well."

Based on the observation of the researcher during the implementation of the videos, the comments of the students to the uploaded videos in their online classroom groups exemplified that these materials were indeed easy to understand.

Student F: "I had a good time watching and learning at the same time. It's like delving deeper to the grammar of mathematics. I now understand more why you have quoted last time that mathematics is a language. Another effective video. "

Student G: "I learned a lot and enjoyed this lesson. It will really help me to understand things in different ways and logically. Indeed mathematics is a language that can be used to express."

This supports the findings in the study of Fajaryati et al., (2017) that by developing the e-module or video-based instructional material, it is expected that students can learn the material easily, effectively, and efficiently. The use of graphics/visuals in videos generally makes a marginal difference to student's judgment of their likely learning performance; their attention, interest and engagement levels; and their eventual learning performance compared with videos with no graphics/visuals (Kahrmann, 2016). These teacher created videos indeed embody the multimedia and modality principles of Mayer et al. (2015). Using any two out of the combination of audio, visuals, and text promote deeper learning than using just one or all three. Learning is more effective when visuals are accompanied by audio narration versus onscreen text.

Flexible. Moreover, the flexibility of the videos played a big part in its effectiveness as a learning material because students can play and pause the videos depending on their available and most convenient time. It was further validated by what Student G, Student H, Student I, and Student J have said.

Student G: "I am grateful that there's a video explainer in each modules. It helps me to understand the lessons well. With the advantage that we can re-watch the explainer to fully get the totality of mathematical ideas."

Student H: "…Moreover, the videos aren't just a way to help us learn but also to boost our independence in learning. In my own stand, I have learned so much thing by just simply watching the videos provided. Other than it is reliable, it also allowed each of us to learn from your discussion in our most comfortable time. The video also lessen my problem with regards of my internet *connection because after I downloaded it, I can watch it until I deeply understand without spending a lot of data connection."*

Student I: "…With the help of these videos, hindi po mahirap ang umintindi sa mga lessons, masaya nga po kasi pwede naming ma pause yung may mga questions at answeran upang ma check kung nauunawaan namin yung diniscuss." (With the help of the videos, understanding the lessons seems to be easier because we can pause and answer the questions posted in some part of the videos, then play it again to check our understanding of the topic discussed).

Student J: "Learning with videos help me understand more the lesson. It is very flexible even compared to face to face class because whenever my brain is not ready for the information, I am free to rewind and play it again."

In addition, the observations of the researcher corroborated with the answers of the participants in the open-ended question regarding the flexibility and reflective aspect of the videos as evinced by the comment of Student K in one of the videos posted in the classroom group.

Student K: "I understand well while making my notes, and I enjoy testing my understanding to answer the checkpoint. It's a little bit confusing especially in the last part of the video but I re-watched the video again. I learn a lot about how the logic of the statement is important."

This result agrees with what Kahrmann (2016) have found out that other factors that students' thought enabled the videos to be effective included the videos being available on their phones so they could watch them anywhere, anytime. They liked them being available if they were absent from class, so they would not get behind in their work. The students liked the way the videos could be re-played or could be paused so they could take notes. It also affirms the Learner control principle of Mayer et al. (2015) which states that for most learners, being able to control the rate at which they learn helps them learn more effectively. Having just play and pause buttons can help more than having an array of controls (back, forward, play, pause).

Social Presence of the Teacher. Many of the participants also shared the same idea that the videos used during their online mathematics class highlighted the social presence of the teacher. Some even argued that their experience is comparable to the usual face to face classroom set-up because they are still listening to the voice of the teacher while discussing the lesson. The combination of visual and audio elements of the video through the teacher's discussion played a vital role in making this experience meaningful for the students. This is depicted in the answers of Student L, Student M, and Student N.

Student L: "Medyo malayo ang agwat ng face-to-face class sa online at modular learning. Itong videos po na ito ay magandang way for the students to learn and understand the lessons well. It's just like a normal set-up of class kung saan mayroong teacher na nag di-discuss." (There is a huge gap between face-to-face instruction and online learning. These videos are good strategies for the students to learn and understand the lessons well. It is similar to the normal face-to-face instruction wherein a teacher discusses the topic.)

Student M: "Some courses and subjects, like Math and Science, truly need face-to-face interactions and hands-on performances that an online or modular means cannot carry out. However, when the videos were introduced to me, somehow I felt the typical classroom vibe. I can clearly hear the voices of my instructors and vividly grasp the whole idea of the topic being discussed. The mathematical stuff is bearable to understand and feasible for us to manage our time learning."

Student N: "Honestly speaking, videos have been great platforms that were provided in this class. Through these, it was easy for me to understand clearly the topic. My experience in watching videos felt like I'm on a face to face to class, because there's a discussion clearly stated in the video same as in modules. Hence I can tell that this was a big help in learning and catching up a lesson. That's why I am grateful enough that there are videos provided in this class."

It is indeed important that the teacher's presence must manifest in an instructional video tutorial as corroborated by the study of Kahrmann (2016) that the teacher's voice has been found to be an effective design feature of the tutorials for both the students and the parents. The videos need to retain the conversational style of delivery. All positive comments centred on how the tutorials sounded like the teacher was talking directly to the student in conversational style. The students liked the way the teacher on the videos asked them questions throughout the videos. This was a big feature they stated as being effective. A few even said they found themselves answering the teacher's questions and talking back to the video screen. This shows that despite of agreeing and having most of approval that video tutorials could truly helped the students in studying mathematics, validation from the teachers still is a vital tool for the students to gain confidence from what they acquired from a video tutorial (Cortez, 2020). Hence, teacher-created videos make learning personalized as reflected in the personalization principle of Mayer et al. (2015).

Suited to New Normal Learning. Ultimately, the students also agreed that the videos used in online mathematics learning are suited in the new normal way of learning because of the clear and detailed explanations, flexibility, accessibility, and built-in reflective assessment for independent learning. They also expressed the idea that this might be a good solution to the problem on how to maximize learning despite of the current pressing situation.

Student H narrated that "During this pandemic, we aren't be able to attend school and be guided personally, but the educational videos you've created has become an effective solution for us who are struggling with the new normal education. Moreover, the videos aren't just a way to help us learn but also to boost our independence in learning. In my own stand, I have learn so much thing by just simply watching the videos provided. Other than it is reliable, it also allowed each of us to learn from your discussion in our most comfortable time."

Student O also shared the same point, "learning through watching videos helps me to further understand the lesson. It gives me a clear explanation how to solve problems. It expand the knowledge that the teacher is trying to discuss. For me it is necessary to have videos with this new way learning."
Student P also cited that "Base on my experience in learning with the videos, it helped me to understand the lesson and it was easy to learn or gain knowledge. Even if there's a crisis that we are facing today which affected our studies, there's a solution like what we are doing today, online learning and by watching videos."

This confirms the study of Wang (2021) on his study in an online undergraduate math course reveals that the multi-technology environment is not as fruitful as many theoretical researchers described. Students improve much more in test performance when using fewer technologies and tools like videos and forum. These updates will ensure a more straightforward and manageable virtual learning environment for students, while creating more quality opportunities for student performance improvement in standardized tests. Other characteristics found to enhance the video tutorials to be suited to new normal learning were their availability on cell phones or mobile devices, working the problems out step-by-step during the videos, and just talking to the viewer during the video. The teacher who makes his or her own video tutorials should always consider the age of the viewer (Kahrmann, 2016).

In addition, the study of Ariyanti & Santoso (2020) in Indonesia on online mathematics learning found out a suggestion from students for online mathematics learning, that is, teachers should make videos or explain material through videos so that students can better understand completion steps and formulas that can be used.

Conclusion and Recommendations

In the changing landscape of education in the new normal which includes online learning, students perceived learning mathematics as difficult which was mainly influenced by their previous experiences in the traditional face to face set-up and innate fear in mathematics. However, most of them are still eager that mathematics learning can still be fun, interesting, exciting, and meaningful through various engaging activities, technology-enabled resources, and innovative approaches amidst the pandemic.

Teacher-created videos are indeed effective in helping the students to reflect on their learning progress through self-assessment as one of the features of the videos, making mathematics learning flexible in terms of time and place, personalizing mathematics learning through the social presence of the teacher, simplifying mathematical concepts through comprehensive discussions, and instigating students' interests that mathematics can be fun.

Video-based instructional material indeed served its purpose to cater the needs of the 21st century learners of a technology-enhanced instructional material suited to the new normal way of learning which would facilitate their construction of knowledge through videos and uphold inclusive, quality, and equitable mathematics education online despite the crisis.

Educational institutions, specifically those in the higher education institutions (HEI's), should consider designing a course or professional development programs on pedagogy and technology-enabled instructional materials like videos to promote optimum learning for the students in various flexible learning modes and empower the teachers to become innovative creators of effective media integrating appropriate design principles. .

Acknowledgment

The author would like to extend his heartfelt thanks to Aklan State University-College of Teacher Education and to the Research & Development Services unit of the university for their unrelenting support in realizing this study.

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Blended learning vs. Pure-printed Modules: Assessing its Effectiveness and Students' Perceptions

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Abstract - With the deployment of remote learning via learning delivery modality brought forth by the pandemic, education has undergone a significant change. These options for distant learning were selected because they would allow students and instructors to continue their education under various conditions. The effectiveness and general satisfaction of blended learning as opposed to conventional classroom instruction delivered via printed modules were the focus of a descriptive survey administered to students participating in a Professional Education course at Quirino State University. Some students got just printed modules, while others received instruction through a hybrid delivery approach that included online and offline distribution of information as well. Both groups thought highly of the course, the instructor, and the learning outcomes. When asked about using the fabric in their future projects, students were upbeat. When asked whether they would consider taking another professional education course using this method again, the majority of students in the blended learning group indicated that they would. There were, however, a few noteworthy differences. Student satisfaction with the clarity of teaching and understanding of field problems was higher among those who used just printed modules in their training. When it came to analytical abilities, students who learned via a hybrid approach reported greater gains. In the end, the learning advantages of both delivery modalities were similar; nevertheless, each might benefit from integrating elements of the other.

Keywords - New Normal, Blended Learning, Pure Printed Modules, Effectiveness, Perception

Introduction

There has been a major shift in the face of education when the pandemic was implemented with remote learning through learning delivery techniques. For students and instructors facing challenging circumstances, several techniques of distance learning were selected. In the last several years, distance learning has become a major educational trend. Nearly every professional organization's publications and conferences have included talks and papers on distance learning in the past year alone, with over a hundred of them focusing on some aspect of remote education. Because of the growth of online learning, many educators believe that education and training will undergo significant changes [1].

Distance learning, according to previous research, still has a wide range of issues stemming from a variety of origins. As a result, putting it into practice becomes challenging. Support for infrastructure and institutional commitment, as well as adequate student preparation, are all critical to the implementation of effective distance education [2].

Courses that are completely online with few or no meetings, like certain online learning courses, are available. Courses that have no meetings throughout the semester are also available. One idea is to use the web primarily as a method of teaching with a restricted number of sessions for the semester. Students may attend a main online course while also meeting with their teacher in person on occasion when using a "blended learning" approach. When students can meet the professor face-to-face, it fosters a feeling of community among them without adding unnecessary stress to their already hectic schedules.

The pure-printed module approach ensures that course goals are accomplished by comparing the efficacy of other course delivery methods to it. Studying the efficacy of entirely online vs completely printed module courses have produced a variety of conclusions. There has been very little research, however, on how printed modules compare to hybrid learning methods. A survey was conducted at Quirino State University, and students were asked about the efficacy of the two methods of distribution.

The worldwide effect of distance education is vast and varied. Significant demand for remote education exists worldwide, despite political and economic factors affecting its uptake. Many programs appeal to a broad range of individuals utilizing a variety of media and utilize the idea of distant education. Some people use print, while others utilize telecommunications, and many others use both. Finally, fast technological advances are putting to the test the traditional ways of defining distance education [1].

According to Simonson et al [1], distance education isn't a sustainable innovation. Instead, e-learning, virtual schooling, and distance learning are societal disruptors. A student who is "ignored by established businesses" (older, working, far away learners) is targeted by distance education (traditional schools). Existing customers do not value distant education's distinct set of performance characteristics. Since earlier technologies had limits, remote learning has become the main teaching technique.

Individual students have poor motivation and learning capacity as a result of limited access to modern technologies and tight budgets. less effective ways of learning via teaching An extensive overhaul was performed on the service and learning management systems [3]. Learning preparation and style as well as particular technical abilities are important concerns for students. Educational responsibilities are changing, models of learning transitions are being explored, as well as types of learning and how learning occurs. This category includes things like learning management systems and tech assistance.

It's also important to keep in mind that there are limitations imposed by organizations and the location, context, and time all matter when it comes to guaranteeing learning outcomes. When, where, and what a student studies are all up to them [4]. Teachable moments such as ethics, attitudes, and conduct can't be influenced by educators. Developing an educational perspective is impossible without receiving input. The role of educators in education is diminishing, therefore educational materials must be well-prepared [5].

An "eidetic reduction" is what Duran [6] calls the amount of time and effort spent focusing on what makes one occurrence stand out from others. However, rather than making an overarching claim about what is happening, this study makes an effort to dig deeper and explore the many different perspectives. Consider additional "similar but distinct phenomena" in your study to help you complete the eidetic reduction.

There is an increasing need for high-quality courses as blended learning methods in teacher education become more prevalent. Blended learning programs' effectiveness is influenced by several variables, according to Kante [7]. For two reasons, self-directed online training should enable instructors to study at their own pace and immediately put new skills and information to use. Another reason is that online training should be integrated into the reality of schools and instructors' everyday practice, making their job both professional and personal for them. Online training should also encourage collaborative activities and link instructors to a broader teaching community, according to a third rationale. For novice instructors, face-to-face contact is particularly important, as Kante [7] pointed shown.

As time goes on, more research is being done on how to create successful blended learning experiences by fusing face-to-face instruction with online components. Collis and Jung [8] believe that training systems should include activities that encourage communication or cooperation between trainers and trainees, as well as between trainees and materials. Assessment should be combined with activities that provide some kind of feedback, such as exercises.

Blended learning courses allow students to engage much more than face-to-face schooling ever could, according to new research [9]. Learners have easier access to discussion groups, email, and the internet, while online course administration makes it simpler for facilitators to monitor the progress of their pupils. Several pieces of research [10] have shown that students learn better in a hybrid learning environment because they are more actively engaged.

According to Schwartzman and Tuttle [11], learning became more active when students felt comfortable around the facilitator and their classmates. The role of the facilitator is becoming more common in blended learning courses. For blended learning, the capacity of a facilitator to assist students to learn in person as well as online is more important than subject matter knowledge, according to many studies [12].

Distance learning has a broad and varied effect across the world. The desire for educational opportunities exists all around the globe, despite politics and economics influencing how distant education is utilized. Many programs appeal to a broad range of individuals utilizing a variety of media and utilize the idea of distant education. Some individuals utilize print, while others rely on telecommunications, and many others combine the two. Finally, fast technological advances are putting to the test the traditional ways of defining distance education [1].

There has been some investigation into the technological components of blended learning. For online learning, several studies emphasize the importance of operational issues (such as Internet access, connection speed, and availability) while designing systems (like a good user interface and web-based resources) [13],[14]. Topics including instructional design and resources, facilitator role, as well as interaction and collaboration, are all part of blended learning research. Technical infrastructure and how it affects the educational process are also taken into consideration. It is the researcher's job to compare the respective merits of blended learning and pure printed module distribution concerning the following study questions:

1. What are the comparative overall perceptions of the course as to:
   a. Blended learning and
   b. Pure-printed modules?
2. What are the learning outcomes and skills developed using the:
   a. Blended learning and
   b. Pure-printed modules?
3. Is there a significant difference between blended learning and pure printed modules as to:
   a. Perception of the course and
   b. Learning outcomes and skills developed?

Methodology

Student enrollment in conventional printed modules or a hybrid learning component first covered Curriculum Development and Evaluation as a Professional Education topic. The instructor, with the exception of how he or she delivered the information, remained consistent throughout the course. They provide us the ability to account for things like the different teaching methods, evaluation criteria, and other potential stumbling blocks used by instructors. Students are spread out across two semesters, regardless of whether they are studying traditional printed modules or the blended learning option. When we compared survey item responses across semesters using different delivery strategies, there were no significant differences. During the semester, blended learning students met online once a week. Throughout the semester, we met for two hours each week via video chat. If an instructor delivers printed modules, pupils just need to meet once a week for the duration of the semester. There were no differences in the factors that went into determining a student's grade, such as the relative importance of each factor. Text messages are only used by students to get in touch with their teachers when they have specific queries. Printed modules, on the other hand, aren't the only thing a teacher may use in the classroom. The instructor used a mix of lecture and conversation as part of his blended learning approach. Students sent questions about certain topics through email to the instructor in advance. Students enrolled in blended learning must attend all of their online class meetings.

Results and Discussions

When it comes to overall course efficacy, the two alternative delivery modes (online and in-person) are equally successful (Table 1). Table 1 displays the results. Students used a five-point Likert scale to evaluate each of these statements from 1 (strongly disagree) to 5 (strongly agree) (strongly agree). The scientists used t-tests to see whether there were any differences between the groups.

Table 1: Comparative Overall Perceptions of the Course

ITEMS	BLENDED LEARNING (n=35)	Qualitative Description	PURE PRINTED MODULES (n=16)	Qualitative Description
1. Overall, this was an excellent course.	4.03	Agree	4.63	Strongly agree
2. Overall, the instructor was an excellent teacher.	4.37	Agree	4.25	agree
3. I learned a great deal from this course.	4.00	Agree	4.63	Strongly agree
4. I gained a good understanding of concepts/principles in this field.	3.89	Agree	4.31	agree
5. The clarity of instruction was good.	3.97	Agree	4.50	Strongly agree
6. I will use what I learned in EDUC 208 in my career.	4.23	Agree	4.56	Strongly agree
7. I deepened my interest in the subject matter of this course.	3.97	Agree	4.38	agree
8. I was motivated to do well in EDUC 208.	4.06	Agree	4.50	Strongly agree
9. I enjoyed the class	4.14	Agree	4.25	Agree
10. The course was interesting	4.11	Agree	4.44	Agree
11. The course was difficult	3.40	Moderately agree	3.38	Moderately agree
12. I am confident in my ability to understand and apply concepts learned in this course.	3.83	Agree	3.88	Agree
OVERALL MEAN	**4**	**Agree**	**4.31**	**Agree**

1.00-1.49: Strongly disagree; 1.50-2.49: Disagree; 2.50-3.49: Moderately agree; 3:50- 4.49: Agree; 4.50-5.00: Strongly agree

The course was well-liked by both groups, as indicated in Table 1. Even though the mean answer for Item 1 was greater in the pure printed module condition, the difference is statistically significant for that particular item. Students were asked about their expected grades on a second item (on a different scale), and their answers were vastly different from prior ones. Both groups learned a great deal from the course and did a great job applying it (Item 3). The two groups seem to learn and perform at vastly different rates. Furthermore, students in each group were confident in their future skills when applying what they'd learned up to this point (Item 6).

Even yet, students in both pure printed modules and blended learning are generally satisfied with class results and believe that the class stimulated their interest in the subject (Item 7). This particular item's disparity in resources was negligible. It was for this reason that students from both groups were given incentives to do well in class, and a fun course was created (Item 8). Here we are at number nine on the list. There was no statistically significant difference in any of these variables.

Table 1 shows even more discrepancies when examined in depth. Pure printed modules' students were happier with the clarity of instruction (Item 5) and more certain that they had gained a thorough grasp of the subject since both courses had a single instructor (Item 4). Students who attended mixed learning courses had a better opinion of the instructor than those who only took printed courses, notwithstanding this (Item 2). What's surprising about this outcome is that something else is counteracting the negative impact of being unhappy with the clarity of the instructional material... Students who used blended learning (Item 11) had more difficulties in the course as a whole (perhaps due to their perceptions of instructional clarity during online meetings).

In the overall perception of the course, table 1 showed that pure printed modules got the highest score with the overall weighted mean of 4.31, respectively, with qualitative description agree. While blended learning got the lowest score with the weighted mean of 4 with qualitative description agrees.

Therefore, pure printed modules are the most preferred method of delivery of the students in the course because students engage themselves in learning the concepts presented in the module. They develop a sense of responsibility in accomplishing the tasks provided. This is contrary to the study of Chen and Jones [15] which blended learning is the most preferred method of delivery of the students in the course accounting. They preferred blended learning because it allows them to study in a digital environment with virtual tools that they are comfortable with and frequently use in their daily lives. Nevertheless, both methods of delivery are acceptable.

As to skills developed, table 2 shows mean responses related to several skills commonly named as desirable for development in university curricula. Again, students responded on a scale from 1 (strongly disagree) to 5 (strongly agree).

Table 2: Learning Outcomes and Skills Developed

ITEMS	BLENDED LEARNING	Qualitative Description	PURE PRINTED MODULES	Qualitative Description
1. My writing skills have improved as a result of this course	3.80	Agree	3.88	Agree
2. My analytical skills have improved as a result of this course.	3.77	Agree	3.75	Agree
3. My interpersonal skills have improved as a result of this course.	3.71	Agree	3.88	Agree
4. My computer skills have improved as a result of this course.	3.83	Agree	3.38	Moderately agree
5. I am confident in determining what is relevant in solving problems.	3.77	Agree	3.69	Agree
OVERALL MEAN	**3.78**	**Agree**	**3.72**	**Agree**

1.00-1.49: Strongly disagree; 1.50-2.49: Disagree; 2.50-3.49: Moderately agree; 3:50- 4.49: Agree; 4.50-5.00: Strongly agree

Table 1 shows that blended-learning students felt the course was more difficult, as shown by their responses there. To the surprise of most people, however, blended learning students were far more likely to say that the course enhanced their analytical skills (Item 14). This discrepancy is intriguing since the only thing that changed was how the components were distributed. Online or mostly online distribution may place an even greater burden on learners than pure printed module distribution since students cannot rely as much on class attendance to answer queries about the subject. To pull themselves out of a bind, these pupils may have had to rely more on self-initiative and ingenuity.

Those who used blended learning said that their computer abilities had improved compared to students who did not (Item 16). As a result of the low mean response in both groups, it's likely that students' prior computer usage had an impact. Students did not acquire computer skills in this course, for better or worse. Students in both groups did not seem to think, as many do, that college courses improved their writing abilities (Item 13). Developing better writing abilities is, however, a coincidental side effect of most professional development programs. Both groups agreed that the workshop did not do much to improve their social skills.

When it comes to overall competency, blended-learning students seem to have the worst opinion of the course. A surprising number of blended learning students agreed that the course helped them enhance their skills, as measured by the aggregate weighted mean of 3.78. This discrepancy intrigues me since the only thing differentiating the components was the distribution technique. In contrast to blended learning, where students may rely on the teacher to answer questions about the topic, printed modules place a greater responsibility on students. To pull themselves out of a bind, these pupils may have had to rely more on self-initiative and ingenuity.

Both sets of students were confident when it comes to finding out what's essential to solve issues. Solving problems creatively is a prized skill in today's classroom. That's why your career growth depends on it. Gajdos [16] asserts that instructors must be skilled in resolving inefficient problems. There is a significant correlation between problem-solving skills such as interpretation and representation of problems in cognitive and metacognitive processes including reasoning and information collecting as well as evaluation and solution development. J. Orgovanyi-Gajdos [17] argues that teachers must have the ability to deal effectively with problems.

Table 3: Significant Difference of Blended learning and pure printed modules

ITEMS	BLENDED LEARNING	Qualitative Description	PURE PRINTED MODULES	Qualitative Description
1. My writing skills have improved as a result of this course	3.80	Agree	3.88	Agree
2. My analytical skills have improved as a result of this course.	3.77	Agree	3.75	Agree
3. My interpersonal skills have improved as a result of this course.	3.71	Agree	3.88	Agree
4. My computer skills have improved as a result of this course.	3.83	Agree	3.38	Moderately agree
5. I am confident in determining what is relevant in solving problems.	3.77	Agree	3.69	Agree
OVERALL MEAN	**3.78**	**Agree**	**3.72**	**Agree**

1.00-1.49: Strongly disagree; 1.50-2.49: Disagree; 2.50-3.49: Moderately agree; 3:50- 4.49: Agree; 4.50-5.00: Strongly agree

Table 3 shows a substantial difference between the two methods of delivering courses and compares them. The calculated T (4.32) exceeds the threshold T since the P-value in the Comparative overall impression of the course is less than 0.05 alpha level (2.20). It's because of this that traditional and blended learning have become almost identical concepts. This result does not seem to have much of an impact on students' opinions on blended learning vs traditional, printed courses. Student perceptions of a teacher and a course are influenced by factors other than instruction, according to Cooper [18].

Student views may be influenced by the ease of the course or the speed with which an instructor replies to email questions. P-values below the alpha level, such as 0.001, indicate a substantial difference in skill growth. The null hypothesis that mixed learning and pure printed modules have similar skill development outcomes is rejected by a P-value of less than 0.05. (0.001). Thus, abilities gained via a blended learning course differ significantly from those gained in a conventional classroom environment. This indicates that students' abilities will be impacted regardless of whether they use blended learning or a conventional printed module method of course delivery.

Conclusion and Recommendations

According to the study's findings, students prefer to get the printed module as a means of retaining a positive image of the course. When compared to traditional distribution of printed modules, participants in the study found that blended learning improved skills more. An examination of students' attitudes about the course found no differences between those who received instruction in mixed and pure printed module forms.

On the other hand, acquired talents are radically different. Both delivery techniques, on the other hand, are acceptable. One college conducted the survey, which included students from the institution's professional education course EDUC 20B.

As a result, drawing broad conclusions about other programs is challenging. This approach has been criticized, yet despite this, it was necessary to create significant comparisons between two delivery systems. The only variation between the two groups was that the other utilized two portions of the distribution technique rather than one, and we discovered no changes related to the semester in either one or both.

For both sections of the exam, the instructor was the same. Both courses used the same grading and course management systems. Learning results vary according on the teaching methods used, which is consistent with previous research [1], [2]. The disparities may be due to differences in instructors, institutions, course designs, and course content.

Using these findings as a guide, other programs and academic institutions may conduct similar investigations. The efficacy of courses delivered entirely online should be examined in future studies as well. This study's findings on the second point offer some preliminary proof.

Following are some thoughts on the findings. Students who took two courses back-to-back did not differ significantly from those who just took one. Both groups in the class agreed that the training would be very useful in their future jobs once they graduated. The second conclusion is in line with the earlier Cooper [18] investigation. However, according to the survey findings, using just printed modules produces the most understandable instructional material. It's possible that students and instructors will prefer printed modules.

Now educators may use a more conversational style of teaching instead of relying only on a computer keyboard to transmit knowledge. This may make it easier for the instructor to highlight certain numbers or areas of emphasis when using printed modules. This may be more cost-effective if just printed modules are used to learn the field's theories and concepts. There will be greater use of the student's books as learning resources, thus the student will have more complete access to learning resources. If instructors encourage their pupils to spend more time online, the traditional printed module approach may be enhanced. Students may become less dependent on classroom attendance as a spectator role because to the growing emphasis put on the internet. However, students may need to put in more effort and prepare more in advance for online "meetings" than in a traditional classroom environment. As a result, they have a lower risk of becoming emotionally cold and unresponsive over time. Some instructors excel at combining active learning techniques and may significantly reduce or even eliminate this issue for disengaged students in the classroom. Instructors who can close the knowledge gap and assist students learn more about the subject matter benefit from differential appreciation, which may be attributed to increased student engagement. It seems that blended learning doesn't hinder the development of certain skills in light of these findings The general problem-solving skills of students who took part in both delivery modalities were rated similarly by both groups. Even while students who solely used printed modules to finish the course thought their analytical skills had improved, the opposite was true. Even though this study cannot provide conclusive proof, the final outcome may be related to their perceptions of understanding the concepts in the preceding paragraph.

Acknowledgement

The researcher would like to thank the administration, faculty, staff, and students of the University, who in one way or another helped in the conduct of the study.

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Don't English Me, I'm Panic! A Situational Analysis of Grade-10 Students' Speaking in English

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Abstract - To achieve effective communication, an individual must develop good speaking performance. However, Filipinos being regarded as among the countries with proficient ESL speakers is being challenges by various reports which include the two-year study conducted by Hopkins International Partners which showed that Filipino university graduates averaged only 630 on English proficiency based on the test of English for International Communication (TOEIC) which relatively lower than the 850 TOIEC of agents who work in business process outsourcing companies. In addition, the average score given of B1 given to Filipino graduates by the Common European Framework of Reference of Language (CEFR) is lower than the CEFR B2 proficiency target set for high school graduates by EFL-speaking countries like Thailand and Vietnam. Moreover, Filipino university graduates' English proficiency median score was said to be compared to 5th and 6th grade of students from US or UK. These results only showed that Philippines may not be meeting the global English standards at present. This led this study to look into the situation of ESL speakers at a level where they are being hone with basic knowledge to prepare them for higher education. Using mixed method, the researchers conducted a survey using modified standardized instruments as well as focused group discussion to students from a local high school in Manila. Results showed that students who generally spoke Tagalog at home liked speaking in English, but would only practice speak it sometimes outside of the classroom. Also, while most of them view speaking in English as normally needed for their future jobs, they are found to be anxious about speaking in English in the classroom.

Keywords - Oral English Proficiency, Oral Communication, Oral English Performance, English Communication

Introduction

Spoken language is at the heart of every human interaction at home, at work, and in society. According to Burns and Joyce (cited in Forez, 1999) communication is an interactive process of constructing meaning that involves producing, receiving, and processing information. Hence, speaking is a salient process of giving and making information.

Communication skills is among the 21st century skills that learners need to hone to keep up with globalization and oral communication has been viewed that as a skill by which learners are judged in real life situation according to Brown and Yuke (cited in Rao, 2019). It is only important to give learners various opportunities to use and produce English accurately, efficiency in communication and include it as primary objective of all English language teachers. However, Filipino language learners, after years of studying English, can still fail to communicate fluently and confidently, and this can be associated to limited use of the second language in day-to-day communication (Separa, et al., 2020), language anxiety which can sometimes be caused by classroom speaking activities (Jugo, 2020), and not being able to acquire the needed language skills and knowledge in their formative years (Senobio, 2015). Therefore the decline in the English Performance Index from 14th place in 2018 to 20th place in 2020 as reported by Standard English Test can indeed be matter to be concerned about by the education bureaus, school administrators, classroom English teachers.

The cited situations have steered the researchers to investigate about the secondary school learners in terms of speaking in English. Determining the attitude of students, the factors which affect their performance, and the problems they may have in terms of speaking in the second language will afford those who manage the language learning of the students from policy to classroom implantation an understanding of how learners view speaking in English in and out of the classroom.

Methodology

The study used mixed methods in the form of survey and focused group discussion (FGD) in generating data for the study. Using a standardized instrument from a study by Tuan and Mai (2015) that is modified to meet the objections of the study and a checklist of question for the focused group discussion, 199 (of the 398) male and female, Grade-10 students of batch 2018-2019 whose ages ranged from 15-21 and would use Filipino as language at home have participated in the study. The respondents were drawn using simple random sampling. Permission from school administrators were sought prior to the conduct of data generation, and students have been oriented of the process which include the survey and the FGD and they were made to choose from the two. Aside from these 199 pupils, 12 have given assent to participate in the focused group discussion. Quantitative obtained were tallied and tabulated and computed using frequency and percent, and ranking.

Results and Discussions

The following are the results of the data drawn from the 199 students.

Table 1. Frequency and Percent Distribution of Pupils According to Their Interest in Speaking English in Class

How much do you like speaking English in class?	Frequency	Percent
Normal	101	50.75
Little	72	36.18
Not at all	7	3.52

Table 1 presents students' interest in speaking in English class. Majority of the Grade-10 students answered that their likeness in speaking the language is just normal.

As exhibited in the table, there are 7 or 3.52% of students who did not like speaking in English class at all. Subsequently, there were 19 or 9.55% of students who liked to speak in English class very much. Moreover, 72 or 36.18% of them liked speaking in English class a little and 101 or 50.75% of the students had a normal liking towards speaking in English class.

If students in the survey maintained normal liking towards speaking in English, students who joined the FGD have cited they like speaking in English in the class (although not all of them have expressed such in the second language) citing that it enhanced their speaking performance; it was the global language; it helped them communicate to other people all over the world.

Table 2. Frequency and Percent Distribution of Pupils According to How Often They Practice Speaking English outside of the Class

How much do you like speaking English in class?	Frequency	Percent
Always	7	3.52
Usually,	33	16.58
Sometimes	129	64.82
Rarely	20	10.05
Never	10	5.03
Total	199	100

Most of the respondents practice English sometimes with 129 or 64.82%. Thirty-three (33) or 16.58% of them usually practice English. Twenty (20) or 10% of the students rarely practice English outside the classroom. Ten (10) or 5.03% never practice English outside the classroom and 7 or 3.52% would always practice English outside the classroom

Conforming to the survey results, relatively fewer students from the FGD group have cited they practice English outside the class and would state that different means of doing so. One student would practice alone after reading a story from Wattpad. One student had to practice because of a sibling who is in a relationship with an American. It is notable to cite the one student who claimed that speaking in ESL can be caused for her to be teased by classmates which led for the student not to be confident about practicing oral English.

Table 3. Frequency and Percent Distribution of the Perception of the Pupils on the Necessity of Speaking English for Their Future Job

How important is English in your future job?	Frequency	Percent
Very Necessary	55	27.64
Necessary	55	27.64
Normal	78	39.20
Unnecessary	11	5.53
Total	199	100.00

As shown by the table 78 or 39.20% of the students have answered that speaking English is normally important for their job in the future. Fifty-five (55) or 27.64 % of them have answered English is a necessary skill for their future job. Another 55 or 27.64 % answered English was a very necessary skill for their future job and 11 or 5.53% of the respondents have considered English as unnecessary for their future job.

On the other hand, those who have joined the FGD have cited that they find speaking English to be necessary for their future job as there are situations that will require them to do so; the college program they will take entails dealing with tourists which will need for them to speak in English; it will be less difficult to communicate in English at work; and some of them see themselves working in the IT or Call Center industry which will require them to speak in English.

Table 4. Frequency and Percent Distribution of Emotional Perception of the Pupils in terms of their Oral English Performance

How do you feel when speaking in class?	Frequency	Percent
Motivated	50	25.13
Anxious	80	40.20
Confident	69	34.67
Total	199	100.00

Table 7 shows the pupils' feeling towards speaking English in class. There were 80 or 40.20% of 199 students who answered they are feeling anxious when they are to speak in class while 69 or 34.67% are feeling confident, and the remaining 50 or 25.13% feel motivated in speaking in an English-speaking class.

Most of the participants in the FGD have cited they are also anxious about speaking English in the class. Reasons for which are discussed in the following table.

Table 5. Frequency and Ranking of Problems Encountered by the Pupils in Speaking English in Class

What problems have you encountered in speaking in English	Frequency	Percent
You are worried about making mistakes	151	1
You are fearful of criticism or losing a face	62	3
You cannot think of anything to say	42	6
You are not motivated to express yourself	38	7
You speak very little or not at all	50	4
You use Filipino	49	5
You are shy	92	2

Table 11 reveals the problems students encountered in speaking English. Out of the seven factors provided, most students answered that they are worried about making mistakes with 151 which ranks the first. Second is being shy with 92, and third is being fearful of criticism or losing face with 62. Speaking very little or not at all is fourth with 50; followed by the tendency to use Filipino with 49. The two with the lowest answers are not being able to think of anything to say with 42 and having no motivation to express oneself with 38.

Participants of the FGD, on the other hand, have mentioned that problems they encountered include being nervous, being afraid to be laughed at, being worried of their mistakes, being shy, and anticipating their classmate's reactions.

Table 6. Frequency and Ranking of Factors that Affect Students' Speaking English in Class

What affects your speaking performance in the class?	Frequency	Percent
Time for preparation	90	2
Pressure to perform well	101	1
Listeners' support	62	4
Motivation to speak	48	6
Confidence	74	3
Anxiety	42	7
Topical knowledge	41	8.5
Listening ability	41	8.5
Time allowed to a specific speaking task	51	5

Table 6 presents the distribution of factors that affect students' performance in speaking English in the class. The top answer is the pressure to perform well with 101. Second is time for preparation with 90, and the third is confidence with 74.

As for the participants in the FGD, students cited their self-confidence as the factor that affect their speaking performance. When asked to clarify, they mentioned that the lack of confidence has led for them to speak in English less inside the classroom.

Conclusion and Recommendations

From the results, the study concludes that in terms of attitude, students have normal feeling about speaking English in class although they do not always practice speaking in ESL outside the classroom; that they feel normal about the necessity of English in their future jobs; and that they feel anxious about speaking English in class. Students are also found to be worried of their mistakes, shy, and fearful of criticisms when it comes to speaking in English. They also find the pressure to perform well, time for preparation and confidence as factors that affect their speaking in class.

Since the root of the problems with students' performance have got to do with building up their confidence to speaking, allowing for more oral English activities should really be the main consideration of English teachers. Current trends on performance tasks that promotes cooperative learning, outcomes-based, and inquiry-based learning could greatly help in making students become more confidence in speaking. These activities can also effectively be coupled with the functional use of language in teaching not only grammar but other skills as well. Administrators should also revisit their remedial program to check how much focus is provided on enriching students' oral English skills and formulate policy should there be need to enhance that aspect of their program.

Acknowledgement

The researchers wish to thank the English faculty and administration of Antonio A. Maceda for the school year 2018-2019 for the support they have afforded them throughout the conduct of the study.

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Lived Experiences of Educators Engaged in Continuing Professional Development in the New Normal: Insights from Seven Countries

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Abstract - This study focused on exploring and capturing the essence and meaning of the lived experiences of educators engaged in continuing professional development in the new normal. The study followed a qualitative research design and used the transcendental phenomenological processes. Based from the testimonies gathered from the participants from seven different countries- Philippines, USA, Panama, Peru, Pakistan, Nigeria, and Morocco they revealed that as a result of the Continuing Professional Development during pandemic, they have manifested adaptability and innovation to meet the demands of the current situation. With the force transition from face to face interaction to remote learning, they have tried their best to maintain a balance of digital and life skills. Participants also engaged in CPD in order to achieve creativity and resourcefulness to deliver and meet students' quality learning amidst pandemic. They also considered as blessings and great opportunity the connection and collaboration established with educators around the world during this time of Covid-19. They also achieved the passion for ever-learning mindset and satisfaction through CPD. Participants expressed that mindfulness and wellbeing of teachers should be set as priorities for their engagement to CPD in the new normal. The researcher recommends that the policy makers review and revisit their program for CPD training of the teachers during this period. Heads of the education sectors may also benchmark the CPD Training plan of this study and conduct needs analysis to provide the most appropriate trainings for the teachers based on their needs, skills and interests

Keywords - continuing, development, educators, new normal, professional,

Introduction

Teachers' professional development is described as "activities that improve teachers' skills, knowledge, expertise, and other teacher characteristics" (OECD, 2009, p.49). Professional learning, according to Levin (2014), is a more apt concept for professional development these days because it is "ongoing, always intense, and often centered on enhancing student learning."

Due to the current situation, the COVID-19 pandemic which is considered the major global pandemic for the last 100 years, teachers' professional development has been greatly affected. The pandemic has brought extraordinary challenges and has affected the education sectors all over the world. For more than a year now, each country is still implementing plans and procedures on how to contain the virus as the infections are still continually rising. Since January 30, 2020, the Philippines has faced a critical situation due to COVID-19 Pandemic. The Higher Education Institutions along with the Department of Education's (DepEd) primordial concern was to avoid and limit the risks of the infection of the academic community. The implementation of the community quarantine led to the deferment of the conduct of classes and other face-to-face activities. The challenge now is how to continue teaching and learning beyond face-to-face instruction.

Educational institutions in most parts of the world have physically closed with students and faculty forced to shift from traditional to distance learning and working from home. With this drastic change, the education sector especially the students and faculty members face an unprecedented challenging situation. People's lives and routines have changed dramatically as they continue this ongoing battle with the COVID-19 pandemic. However, it is fair to say that despite of the educational disruption, the education sector has not been fully jolted due to digital convergence and the online education revolution. The year 2020 marks the history in education in which the forced transition of many traditional classes and activities to an online digital learning environment may result in the longer-term adoption of remote working and learning (Qadir 2020).

Globally, teacher education programs are designed for providing educators with the certification and competencies required in their professional careers (Rao, 2004). Institutional management intentionally creates in-service training opportunities to ensure quality teaching and faculty retention (Ali, 2008). Guskey (2002, p. 381) emphasizes the importance of professional development, saying, "high-quality professional development is a central component of virtually every modern plan for improving education." Similarly, according to Seyoum (2011), educational changes will only succeed if "teachers are equipped with subject matter expertise and an evidence-and-standards-based range of pedagogical skills" (p.381). Given the key importance of professional development programs for the successful realization of any educational transformation, the quality of learning activities for school staff is a major issue in both policy discussion and educational research (Wilson & Berne, 1999).

As the world begins to relax some of the strict measures that have been in place, the only certain thing is that the 'new normal' will not be the same as before.

For this reason, the researcher saw the big challenge that lies in what new skills do educators need to support the students and how can they continue to develop as professionals in the current situation.

With the shared practices and experiences of educators from different countries such as Philippines, USA, Panama, Nigeria, Pakistan, Morocco and Peru leading professional development, the academic leaders in any education sector can gain various strategies on how to provide continuing professional development for teachers during this new normal. In order to explore and understand the lived experiences of educators engaged in continuing professional development in the new normal, the researcher formulated the following research questions:

1. How do the educators describe their experiences as regards the challenges encountered on continuing professional development in the new normal?
2. How do educators perceive continuing professional development in the new normal?
3. What themes emerge from the testimonies shared by the educators on continuing professional development in the new normal?
4. Based on the findings and reflections, what continuing professional development model for educators can be provided?

Methodology

This research study focused on the lived experiences of the educators as their collective voices were heard through the research design. I collected data directly from the phenomena under study (Creswell, 2007). In this study, the phenomenon of educators engaged in continuing professional development in the new normal was explored. This qualitative research study included an in-depth analysis of the reported and shared experiences and testimonies of the participants. The following were the transcendental phenomenological process, I considered and used in the treatment of qualitative data analysis.

1.I conducted synchronous individual interviews, asynchronous interviews through google form and online Focus Group Discussion. All the online interviews were conducted via zoom with considerations to the participants' convenience and preferred time zone. After conducting the interview, I, myself transcribed in verbatim all the shared experiences of the participants. I validated their interview responses from the results of their asynchronous interview. After the transcription, I conducted the second interview, the Focus Group Discussion which aimed to follow up questions and explored more meanings to the participants' lived experiences. The transcriptions were then submitted to each participant for validation and confirmation of their shared testimonies.

2.I practiced setting aside my preconceived ideas on the phenomena (epoche). I listed and bracketed all my preconceived ideas, biases, and judgment. My personal experiences on the phenomenon were also revealed in the study. Throughout the process, I observed this approach so I can set aside my views of the phenomenon and focus on those views reported by the participants (Moustakas, 1994). This also helped me to remain fresh and new in observing the phenomenon.

3.The next step in this phenomenological study was a phenomenological reduction. I identified significant statements/horizons (horizonalization) in the database from participants and treated them with equal value. Specific statements in the transcript that described the participants' views and experiences related to his/her lived experiences on continuing professional development in the new normal were identified and numbered referred to as horizon.

4.After reviewing that all the horizons have met the requirements, I carefully examined all the invariant constituents and the interconnectedness of each quality. I remained practicing the phenomenological process of epoche to ensure that participants' descriptions and not my perception were considered throughout the data analysis. Then, I clustered these statements into meaning units and themes. From each of the significant statements of the participants, I generated 56 initials themes. Each of the initials themes was related to continuing professional development. Some of the themes were derived from the exact word of the participants. In this process, I used vivo coding. In vivo coding is a form of qualitative data analysis that emphasizes the actual spoken words of the participants. ... In vivo coding is championed by many for its usefulness in highlighting the voices of participants and for its reliance on the participants themselves for giving meaning to the data. (Manning 2017). I used this to make sure that the actual experiences of the participants were reflected.

5.The next step was, I examined these statements and initial themes and clustered them into sub-themes. In this manner, I derived 32 sub-themes from the initial themes.

6. After extracting sub-themes from initial themes, the next step was to check and review sub-themes and clustered them into final or main themes. In this step, all similar ideas were grouped. I maintained that the sub-themes and main themes were reflecting the actual lived experiences of the participants. The main themes were generated from the shared testimonies of the participants. To fully describe the phenomenon, a discovery of similar themes among different participants added to the rich, descriptive analysis of the phenomenon. Abstract concepts were not used as themes. To ensure that I have derived the correct and appropriate themes from the participants' shared experiences and testimonies and become true in the essence of reflecting their actual experiences, the six generated themes were peer-reviewed by three qualitative researchers and the participants themselves.

7.Next, I synthesized the themes into a description of the experiences of the individuals (textual and structural descriptions). Then, I wrote individual textural descriptions for each participant. Verbatim statements of the participants were lifted and I prepared the narrative representing the participant's experience with the phenomenon.

8.Then, I constructed a composite textural description of the meanings and the essences of the experience. The composite textural description focused on a group description of the participants' lived experiences on continuing professional development in the new normal.

9.I also prepared individual structural descriptions for each participant. I integrated the structural qualities and themes into an individual structural description. I discussed the experiences, challenges, and perception on engaging to the continuing professional development in the new normal.

10. Then, I prepared the composite structural description. I strived to give meaning to the setting and context in which the phenomena were experienced (Moustakas, 1994). Using the themes, I wrote the structural description of the individual's experiences. Structural description discussed the meanings the individual attached to their lived experiences on continuing professional development in the new normal.

11.Then, I synthesized the composite textural and structural descriptions meanings and essences of the experiences. The composite description represented the meaning of the experiences of the participants involved in the study. I presented the six main themes using a thematic framework as suggested by Kiurkow 2020. He mentioned that the researcher can present her themes in a way she prefers like using tables, diagrams or plain text.

<table>
<tr><td rowspan="4">Researcher's Epoche/ Bracketing</td><td colspan="5">Phenomenological Reduction</td></tr>
<tr><td>Horizonalization (listing of significant statements)</td><td>Invariant Qualities and Themes
(identifying initial themes from horizons)</td><td>Clustering Themes
(deriving sub-themes to final themes)</td><td>Write-up of the individual textural description of experiences</td><td>Write-up the composite textural description of experiences</td></tr>
<tr><td colspan="2">Imaginative Variation</td><td colspan="3">Essences</td></tr>
<tr><td>Individual Structural Description</td><td>Composite Structural Description</td><td colspan="3">Syntheses of Composite Textural-Structural Description</td></tr>
</table>

Figure 1: Transcendental Phenomenological Process (Moustakas 1994)

Results and Discussions

After collecting and analysing the shared experiences and testimonies from the participants from seven different countries, the following terms emerged from their testimonies:

The six main themes described the aspect of the actual experiences shared by the participants.

As part of the Continuing Professional Development during the pandemic, the participants have manifested adaptability and innovation to meet the demands of the current situation.

Participants perceived that the new normal was challenging and was a very different situation. They also felt that there were a lot of challenges due to the sudden shift but due to their engagement with continuing professional development, they have learned to manage and adjust. The theme that emerged from the participants' testimonies implied that educators were trying their best to equip themselves with the skills even that it may be difficult for them. Their engagement to continuing professional development in the new normal helped them adjust to the situation. It also helped them to use innovative tools, find activities and ways on how to deal with the teaching and learning in the new normal.

With the force transition from face-to-face interaction to remote learning, the participants have tried their best to maintain a balance of digital skills and life skills.

Based on the testimonies of the participants and shared experiences during the interview, they have attended and facilitated various training and conferences on digital literacy skills, use of tools and apps, and other online platforms. They also perceived that they also have attended other training which was not technology-related but focused on developing life skills. The second theme that emerged from these participants' narrative experiences proved that with the force transition from face-to-face interaction to remote learning, the participants have tried their best to maintain a balance of digital skills and life skills.

They also believed that CPD training for teachers should not only focus on developing digital skills but should also consider other life skills. They perceived that teachers should be taught as well of managing tools and how to handle themselves in front of cameras. They believed that there should be a combination of teaching the tools and helping the teachers manage stress and anxiety in using the tools to help teachers become mentally, emotionally, and spiritually healthy.

Due to the current situation, participants engaged in CPD to achieve creativity and resourcefulness to deliver and meet students' quality learning.

They revealed that due to the current situation, they engaged in continuing professional development training to learn more tools and applications and enhanced their creativity and resourcefulness which they can integrate into their classes and which they can use in facilitating professional development activities. They believed that this creativity and resourcefulness were also the shared skills during the conduct of their CPDs for teachers. They believed that they also have imparted these skills by giving them innovative ideas and providing them different resources. All of the participants believed that most of the online engagement of teachers was in the form of webinars. They perceived that teachers have considered webinars as a form of professional development training that helped them improve their skills. As part of resourcefulness, there were participants who revealed that they were able to do more of international collaboration on continuing professional development through a Covid-Relief Grant which provided them financial assistance and helped them met some of their CPD needs and somehow served as motivation and reward to pursue CPD amidst pandemic.

Considered as blessings and a great opportunity during this time of pandemic was the connection and collaboration established.

All of the participants believed that there was a lot of teachers' collaboration and creation of community practice and support group that emerged during this time of crisis. They perceived that engagement and collaboration among educators were the results of the new normal. They considered connection and collaboration as a blessing and great opportunity during this time of the pandemic. All of them felt and realized the need of establishing connections and rapport among educators across the globe. They believed that through interaction with other people they also learned and improved themselves. All of the participants saw the significance of online collaboration and establish a community of practice during this difficult situation.

What the pandemic has brought the participant was their passion for an ever-learning mindset and achieving satisfaction in their Continuing Professional Development.

All of the participants perceived that through continuing professional development, teachers were being helped and encouraged to learn to adapt to the new normal to perform better. They believed that teachers were integrating the skills they learned from their training into their classroom teaching. They also viewed that teacher used their training for their continuous self-improvement. All of the participants showed their desire for continuous learning and optimal growth and development. They perceived that CPDs helped them to grow personally and professionally. They felt that they should continue to learn and engage more in the different professional development trainings. All of them realized that they gained satisfaction in improving their skills and potentials through continuing professional development. They also believed that CPD also helped them developed their leadership skills to help other educators develop their skills and potentials. All of them expressed respect to those teachers who pursued professional development amidst the limitation brought by Covid 19 Pandemic because of their passion to learn something new and to equip themselves for necessary skills and competencies. Just like the seasoned teachers, they believed that they were trying their best to learn something new as if they were striving and aiming for professional development and for academic excellence too.

Maintaining and sustaining mindfulness and wellbeing was believed by the participants to be an important priority in their engagement to CPD in the new normal.

All of the participants believed that teacher's social and emotional learning self must not be taken for granted when conducting CPD. They also felt that teachers aside from learning digital tools and enhancing digital skills must also be supported with training that would help them grow emotionally, physically, and spiritually. All of the participants realized the need to empower teachers through self-care and wellness.

Aside from the theme emerged, the testimonies of the participants also led to the development of a training plan on continuing professional development for educators in the new normal focused on the training on specific skills, competency, and aspects as suggested by the participants. This training will be concentrated on Teachers' Wellbeing and Mindfulness, Self-Directed Learning, Interactive Competence, and Digital Literacy Skills Training. This training plan was consisted of:

Area 1: CPD Overview and Process (COP). This area covers the introduction and overview of the CPD and the CPD Framework. It also includes the management of resources, goals, and objectives and the target beneficiaries

Area 2: CPD Needs Analysis Plan and CPD Cycle (CNAC). This area includes the pre-assessment of the training needs. It also discusses the need analysis part and the cycle of CPD and the training flow and process.

Area 3: Priority Skills and Competencies Training Plan (PSC). This area includes the contents and instructional plan area. This covers the priority skills and competencies for training as well as the instructional design, methods, and strategies of the training plan. The following components of training are on Teachers' Wellbeing and Mindfulness, Self-Directed Learning, Interactive Competence, and Digital Literacy Skills Training.

Area 4: Monitoring, Evaluation, Sustainability, and Impact Area Plan (MESI). The last part of the training plan focuses on the monitoring and evaluating of the training itself and its outcome. This also includes the monitoring of the sustainability and impact of the training conducted among teachers in the new normal.

The majority of the participants expressed that their experiences in teaching in the new normal were challenging and different. However, their testimonies also revealed that despite challenges, their experiences were also fun, productive, and rewarding and that they learned to manage and adjust to the situation through their engagement with continuing professional development activities and trainings. As specified by Qadir 2020, the physical closure of most of the schools has forced both the students and teachers to shift from traditional to distance learning and working from home. This was an unprecedented challenging situation faced by the education sector especially affecting the students and faculty members. Due to Covid – 19 Pandemic, the lives and routines of people have drastically changed. However, the education sector has responded to this situation by looking for possible ways not to hamper the teaching and learning process. This Covid -19 Pandemic will mark the history of the forced conversion of many traditional classes and activities to the online learning environment. This may result in the longer-term adoption of remote working and learning. The participants themselves engaged in continuing professional development that supported them for ways and means to support teaching and training in the new normal. The majority of the participants conveyed that the technical aspects like internet connection, internet cost, speed and devices were the biggest challenge on their engagement to professional development in the new normal. However, they pointed out that teachers were showing their eagerness and willingness to learn despite the connection issues. Based on their shared testimonies, they dealt with the teachers having a different mindset, who struggled to trust and show willingness in engaging themselves with the continuing professional development in the new normal. Majority of them revealed the different mindsets of teachers in terms of engagement in continuing professional development in the new normal.

All of the participants have attended virtual professional development training and online courses. The testimonies of the participants implied that all of the participants were deeply and actively engaged in attending and facilitating professional development. Aside from looking for professional development opportunities, all of the participants have created different trainings and workshops for their professional growth and eventually shared as well with other educators.

One thing which was also common to all the participants was that they voluntarily and freely shared with other educators the knowledge, skills, and opportunities they have gained from continuing professional development.

All of the participants also emphasized that they were able to connect and collaborate with other different educators across the world through professional development activities. Based on the participants' experiences and testimonies on attending and facilitating professional development in the new normal, all of their engagements used and integrated digital technology tools and online platforms.

All the participants have manifested full engagement in professional development in terms of attending professional development training, webinars, and online courses and at the same time in organizing and creating various CPDs for teachers.

The findings above are supported by a recent international review that concludes that teachers must become 'active agents of their own professional growth' (Schleicher, 2012:73). This could be possible if teachers apply reflective practice Dewey (1993) which is the ability to reflect on one's actions to engage in a process of continuous learning. Reflection is mental processing that is used to fulfill a purpose to achieve some anticipated outcome. The ability to reflect on what, why, and how we do things and to adopt and develop our practice within lifelong learning makes up a good teacher. One way to do reflective practice is to engage in a Professional Learning Experience. These professional learning experiences can be a catalyst for reflecting on practice individually or with others. Professional learning experiences may be through joining a network, participating in professional learning programs, attending conferences which may constitute the continuing professional development programs.

In addition to the participants' full engagement in professional development, they also demonstrated excitement and eagerness to share ideas, knowledge, skills, and learning opportunities to educators not only in their local places but also to teachers around world.

The majority of the participants revealed that they gained improvement of skills and potentials through professional development. The participants also described their engagement in professional development as having the opportunities to build connections with international communities.

Notably, collaborative learning is most likely to be effective where attention is paid to developing trust, building on existing relationships and networks, recognizing respective roles and contributions, ensuring knowledge meets local needs, and addressing competing priorities (Sebba, Kent & Tregenza, 2012). In this study, collaboration with and among the educators was made possible through their online engagement in CPDs. Participants created these collaborations with educators to share the same experiences and learnings.

The participants' experiences in engaging to the different professional development for teachers in the new normal revealed these four subthemes: teachers' mindset in engaging to continuing professional development, use of different platforms for webinars, online courses and training for professional development, high demand for computers and internet connection and devices and established partnership and collaboration through online connections.

All of them mentioned the use of different platforms for webinars, online courses, and training for continuing professional development in the new normal like zoom, WhatsApp, Facebook, Webinars, YouTube, Virtual Classrooms, and Virtual Conferences Apps.

Participants revealed that the new and innovative approaches to professional development which they have encountered since the start of the pandemic were the use of different technology tools and applications in attending and facilitating webinars and training and online collaboration of teachers and creation of community network and support group.

In this study, collaboration with and among the educators was made possible through their online engagement in CPDs. Participants created these collaborations with educators to share the same experiences and learnings.

Aside from the use of different platforms and tools for professional development, the participants also viewed the online collaboration of teachers and the creation of a community network and support group as a new and innovative approach to the new normal. They pointed out that they were able to establish partnership and collaboration.

All of the participants narrated and shared their experiences on how they have established partnerships and collaborations. According to them, these partnerships and collaborations were made possible by the current situation. Through their online groups and social media channels like Facebook, YouTube Channel, WhatsApp, and even Podcast episodes, they were able to meet and collaborate with various educators around the world. Apart from meeting people, they also partnered with universities and schools across the globe and organized different trainings, webinars and projects. There were participants who revealed that they were able to do more of international collaboration on continuing professional development through a Covid-Relief Grant which provided them financial assistance and helped them met some of their CPD needs and somehow served as motivation and reward to pursue CPD amidst pandemic.

With the strict social distancing measures and school closures in many countries, there has been an abrupt change to traditional modes of teaching and learning. As a result, UNESCO has recommended the adoption of distance learning programs and online educational applications designed to reach students remotely. In the same manner, approaches to teachers continuing professional development have shifted to online and blended learning modalities in the new normal.

A range of digital webinars, online courses, and training has been available for free. Many professional leaders around the world have created webinars and training using different platforms. Using social media for professional learning is essential for developing and maintaining effective teaching.

Due to the sudden shift to online and remote learning to ensure sustainable, high quality, and flexible teaching and learning and to maintain continuing professional development, at the center of many of these learning strategies is the use of technology.

Majority of the participants stressed out the digital literacy skills and digital citizenships of teachers. They also revealed that there were teachers who resist change, teachers who did not even grasp the situation, and teachers being set up in the traditional setting. However, they also perceived that teachers were doing their best to adjust to the situation by engaging themselves with training and collaborating with other teachers.

All of these findings from the testimonies and narrated experiences the participants are supported by the study on Teacher Digital capital which is also known as Teachers Professional Development. According to Seale (2013) digital cultural capital can be seen as individuals or groups investing effort and time into enhancing their technical knowledge and skills employing various forms of learning, both formal and informal.

Teachers' digital capital consists of a combination of all their knowledge, skills, and attitudes, complemented by their personal and professional social networks or relationships, which influence their engagement with technology. Technological engagement is seen here as any situation teachers face in which they use or learn about technology. Based on the findings, it intensified the need to be integrated into the training plan on Continuing Professional Development for Educators in the new normal as the output of this study.

The participants' supposed training plans for Continuing Professional Development for educators in the new normal revealed that they would focus on training on digital literacy skills, technology integration and use of digital tools, and training on social and emotional learning, resiliency, and wellness of teachers. To enhance their skills in digital literacy and other topics, teachers are required to take professional development classes for continuous learning (Professional Development for Teachers, n.d.). There are many professional development topic options for teachers. However, teachers might not think digital literacy is an important skill since only several states have required digital literacy training based on state legislation (Digital Literacy, 2019).

All of them have seen the importance of integrating Social and Emotional Learning, Resiliency, and Mindfulness for Teachers. The outline of the training competencies based on the shared testimonies from the participants was: Training on Teachers' Wellbeing and Mindfulness, Self-Directed Learning, Interactive Competence, and Digital Literacy Skills Training.

Conclusion and Recommendations

The following conclusions were derived from the shared testimonies of the participants as well as from the reflection and analysis of the researcher.

All of the participants' teaching experiences in the new normal were challenging. However, they found their experiences fun, productive and rewarding because of their engagement to continuing professional development. They also believed that teachers' social and emotional learning aspects must not be taken for granted when conducting CPD. They also felt that teachers aside from learning digital tools and enhancing digital skills must also be supported with training that would help them grow emotionally, physically, and spiritually. All of the participants realized the need to empower teachers through self-care and wellness.

On teachers' collaboration during their engagement with continuing professional development in the new normal. They recognized the value of CPD in fostering a community of practice, sharing ideas, methods, and resources, getting to know other people from across the globe. All were made possible through teachers' connections and collaboration during CPD. The participants set a culture of professional learning where individual needs were met and considered and opportunities for CPD were designed according to the respective needs of the teachers. Therefore, opportunities for reflection and research-based on CPD in the new normal were provided and possible.

Since participants of this study came from seven different countries, this may lead to establishing international collaborations and linkages which would open opportunities for research and extension and other professional development activities and projects for the educators.

Based on the findings of the study, the researcher has the following recommendations.

1. The educational institutions may strengthen their nationwide internet connectivity program which may also benefit the teachers in order for them to facilitate remote teaching and learning as well as to pursue continuing professional development in the new normal.
2. The approved CPD Training Plan for the new normal may be proposed to CHED/DepEd for consideration and recommendation.
3. Heads of the school administration may consider conducting Professional Development Needs Analysis for teachers so they may develop the most appropriate training plan for teachers based on their skills, knowledge, interests, and needs.
4. Colleges and universities can also help in the continuing professional development of their graduates by aligning their curricula to the needs of companies and industries in local and global markets.
5. Future research collaboration on professional development with educators from other countries may be conducted. Teachers may have entitlement to research training to develop their role as critical users of continuing professional development-oriented research.

Acknowledgement

The researcher's heart is filled with profound gratitude an appreciation to the following sources of inspiration and courage who have helped her immensely in the preparation and completion of this study:
First and foremost, to God Almighty for all the blessing, wisdom, courage and strength He bestowed upon her to make a meaningful and fruitful research study. She acknowledges His divine love and providence.
To the University President, Dr. Mario R. Briones, together with the University officials and Curriculum Instruction Development and Quality Assurance (now CID & QA) for formulating the Learning Continuity Plan which made learning still possible and accessible amidst the pandemic.
To the previous and current Campus Directors of LSPU Los Ba ños Campus, Dr. Daniel D. Bunal, Dr. Robert C. Agatep and Prof. Joel M. Bawica for trusting her potentials and allowing her to conduct various professional development activities since 2018.

To the Associate Dean of the College of Teacher Education, Dr. Karen A. Manaig, for her consideration and understanding extended during the time that the researcher cannot perform her duties and for supporting her to get involved and engaged in other professional development activities and associations.

To her adviser, Dr. Rolando V. Maningas, for giving her the brilliant concept of this dissertation study, for his supervision and support all throughout the conduct of her study and for being with her during the whole research process.

To her expert panel members: Dr. Consorcia S. Tan, subject matter specialist and former CTE Associate Dean, with whom the researcher owes a lot from the time she was hired in the university; for the constant support and guidance provided for her. For believing in her ability and for inspiring and pushing her that she can really make this 700-page Qualitative Research; for giving her the courage to manage challenges during her first three years of stay in LSPU Los Banos Campus. To her Technical Editor, Dr. Lerma P. Buenvinida, for sharing her knowledge and expertise and for expressing her willingness and sincerity for research mentorship to the researcher. Through her consistent reminder and words of encouragement, the researcher was able to pursue her studies. To her Qualitative Data Analysis critic, Dr. Alberto D. Yazon, whose research achievements in terms of publications and citations have been a source of inspiration and a legacy that the researcher looks up to. His advices and assistance contributed to an in-depth understanding of the transcendental phenomenological processes.

To her participants from the Philippines, USA, Panama, Morocco, Nigeria, Pakistan and Peru who have contributed meaningfully and significantly to the whole study which led to the creation of the research output Continuing Professional Development Training Plan for Educators in the New Normal. Truly, they have proven that distance and time do not really matter!

To her validators, Dr. Romualdo A. Mabuan (De La Salle University), Dr. Nimfa G. Dimaculangan (De La Salle Univeristy), Dr. Myrna O. Medrano (Batangas State University) and Sir Nelson Del Mundo (De La Salle University), for the analysis, critiquing and validation of the research and interview questions and for checking and reviewing the accuracy and appropriateness of the themes generated from the study. Their constructive criticisms played a significant role on the refinement, coherence and betterment of this study. The researcher expressed her deepest gratitude for sharing their expertise in doing qualitative research.

To Dr. Nimfa G. Dimaculangan, her former Director of International Local Affairs, for introducing her to the MOOC Camp which has opened the opportunities for the researcher's international collaboration and partnerships.

To Dr. Victoria E. Tamban, her ninang and mentor, for her genuine love, advices and reminders extended to the researcher.

To her friends, Rowan and Deaven and her two siblings Glevz and Edz, for their technical expertise in formatting, reviewing and editing the layout of this manuscript.

To all the special people behind for their unending love, support and patience during her exhausting and busy days. The researcher expressed her warmest gratitude and love..

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Reshaping Teachers' Identity for the New Normal: Thru the Liminal Space of the New Reality

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Abstract - This paper describes the impact of the COVID 19 pandemic on teachers' professional identity and determines the elements needed in a professional development program to prepare teachers in the new normal. This paper employs content analysis of selected literature published online within the 2019–2021-time frame under the significant concept of COVID 19 pandemic, impact on teachers' professional identity, and the sub-idea but essential topics of the liminal space and the new normal. The impact on teachers' identity includes the evolving realities, new spaces which require new skills (personal, social, and professional); and resulted in 3 gaps (access, use, and skills), which made teachers feeling novices again. Hence, a professional development program to reshape a teacher's identity is irrefutably desired. The literature analysis identified several elements that should be included in the professional identity development for teachers in the new normal. These elements include personal, relational, and contextual factors, structural and cultural forces, teacher's agency, access, use, skills gap, fostering self-determination and agency, building collective efficacy and social capital, and online teaching identity. The pandemic has resulted in an unprecedented change to the education system resulting in a new reality. Teachers need to be aware of the liminal space they are in at the moment and allow themselves to undertake professional development to reshape their identities. This personal awareness and professional commitment among teachers and the appropriate responses from relevant agencies are essential steps towards better education in the new normal.

Keywords - COVID 19, Teacher's Identity, New Normal, Professional Development, Liminal Space

Introduction

The pandemic of COVID 19 has indubitably and unprecedently change the way we live, interact, work, teach and learn (Alomari 2021 et al.; Holuka 2020 et al.). As more studies and similar initiatives are carried on, including the philosophical, historical, and sociological reflections by public intellectuals worldwide, we could initially grasp the immense impact of this emergency. As the effects of the pandemic ripples into the personal, social, economic, and education spheres, we've come to realize how volatile, unpredictable, complex, and ambiguous our future reality is. Nevertheless, the ongoing battle of this pandemic has shown the resiliency of people and community, the opportunity to solve and innovate, and the development of social order for the new normal.

The exact implications and long-lasting effects of the pandemic on education are yet to be known. Still, for teachers, it would mean embracing that online learning and related pedagogies will become the standard mode of delivery in the following years. Remote learning will be one of the futures of education. Hence, teachers and teacher education institutions need to adapt to this new context of teaching and learning more than the way they addressed and carried on with their jobs and accountabilities in such unexpected circumstances during the pandemic (Flores and Gago 2020; Nasri et al. 2020; Quezada, Talbot, and Quezada-Parker 2020). However, the process of this professional and institutional transformation will deal with the foundation of teachers' identity and the physical reality of personal, work, and learning spaces.

The Liminal Space

As teachers shifted to online teaching, the pedagogical approach at home is clearly found to be different compared to when in a classroom. The convergence of the physical realities of home, work, and school spaces create tension and psychological conflicts that affect teachers' perception of their roles and identities. The understanding of this situation is vital for the performance of teachers' roles and responsibilities. Teachers' initial response to the emergency depends on their views about the immediate transformation towards online teaching. Some teachers may willingly adapt to the situation, while others may resist and deviate from the institution's initial teaching schemes. In the end, realizing the situation and accepting teachers' losses before the pandemic is crucial in moving forward.

In the change process, Meyer and Land (2005) used the idea of "conceptual space" to account for these interim psychological spaces that an individual occupies – the convergence of work, home, and learning spaces. The idea of liminal space, being betwixt and between traditional and new educational practices, is critical for teachers' professional identity and the performance of their expected duties. Teachers should realize that at the moment, everyone is transitioning towards a new social order that is yet to be established. The big issue is that we can no longer go back to the old ways of previous school practices, yet the implementation of the new methods is still uncertain. It does not guarantee any effectiveness nor efficiency.

For now, the liminal space between a traditional teacher and being an online teacher should be contained in every teacher's perspective of the present and the future. Professional activities and engagements should be based on ones' views of the needed behavior and character of a morally functioning society with no socially accepted norms. Moreover, the inevitable interaction and fusion between the physical and psychological spaces and boundaries of home, work, and learning should be taken seriously so we can adapt adequately. (Ravitch, 2020)

The New Normal

What does the New Normal mean, and what happened to the Old Normal? As COVID 19 pandemic alters the fabric of social structure and etiquette, it paves the way to a different perspective of social interaction and engagements that the standards are yet to be defined. We are familiar with our Old Normal before the pandemic: where we are sure about the world where we are, we know the social rules and roles, where our home, school, and personal spaces are bounded separately with specific orders that we revered and expected to be followed; more importantly, our personal and professional identities are defined and fully integrated into this normal.

When COVID 19 pandemic occurs, all of this status quo became temporary. Teachers and schools needed to go online for the schooling to continue. We abruptly changed into an online teachers from a classroom, face-to-face classes to virtual classrooms. Although the concept of online learning as a subset of distance learning is not new, it is being used intermittently on classroom practices as an alternative approach by a handful of teachers—the process of "being" proved to be a different narrative. As Aristotle argued, the context of "knowing and being" proved to be not everyone's cup of tea (Goff, 2021). The difficulty resides mainly in the convergence of the realities of home, work, personal and learning spaces, and of course, the readiness of the teachers, the institution, the students, the parents, and the community. For teachers, their epistemological beliefs and ontological perspectives were challenged. As this happens, we enter into a conceptual space that allows the convergence of once individually bounded home, work, personal, and learning spaces – the liminal space. Besides the social roles and norms not yet established in this space, teachers' professional identity was also compromised in the context of the digital competencies required to facilitate online teaching. An online teacher identity needs to be incorporated as another component of teachers' identity.

As the pandemic ends and once the liminal becomes routine, the new normal will eventually exist. For the moment, the transition is underway, the new roles and rules are being slowly established, including a remake of teachers' identity as online teachers. (Atkinson, 2020)

Teachers Identity

The social concept of identity is diverse; nevertheless, it is conventionally accepted to be dynamic -as identity is both individually and socially shaped (Coldron & Smith, 2010). Identity is context-dependent in relationship with others, shifting and multiple, and constructing and reconstructing meaning. The concept of identity incorporates personal knowledge, reflection on experiences, presentation and expected perception from others, and recognition by the community. A teacher, mentor, researcher, leader, nature lover, digital-savvy may constitute sub-identities of an individual. Further, identity is also about a feeling of belonging to a collective group. Foucault (1979) "considered space as a quality of social being and it is commonly believed that people are placed within a space, and that 'they come from somewhere'." Space is not a place; identity refers to mental, imagined, or virtual as a contrast to the location and geography of a place.

On the other hand, according to Pillen (2013) et al., professional identity is how professionals explain and justify things concerning other people and contexts; professional identity is not something teachers have, but something they use to make sense of themselves as teachers. Professional identity includes beliefs, values, emotions about teaching and being a teacher. Teacher identity is enacted in the classroom as decision making or in different settings.

Teachers' professional identity has suffered in the incidence of the COVID 19 pandemic; it is what most teachers' have lost in virtual teaching. We need to recognize that teacher identity is crucial because it can exert a powerful influence on career choice, academic roles and responsibilities, and professional development opportunities. For teachers to get ready for the new normal, they need to develop a new professional identity that will include an online teacher identity.

What makes up a teacher's identity?

The literature shows that identity comprises all individuals' personal, psychological, and reflections on social interactions and engagements. New studies about identity also implicate perceived future events as a component of it. For instance, "new teachers and seasoned mentors consider their possible selves in the future when forming their identities within the domains of relationships, management, instruction, and professionalism (Hamman et al., 2010). In a similar manner, Zembylas (2003), noted that new teachers' reflections on past imaginations of what it may be like to become a teacher influence the shaping of contemporary teaching selves. The latter's studies have proven that emotion is "inextricably" linked to identity, and emotional experiences are an important component of self-knowledge. Haviland and Kahlbaugh (1993) call emotions the "glue" of identity as Zembylas points out the role of emotion in helping individuals assert meaning to experience and identity. The present idea supports the claim of Foucault (1979), as cited by Jones and Kessler (2020), who argued that selves do not develop within a vacuum; exterior structures and regulatory forces implicate them.

The formation of teachers' identity is also influenced by knowledge of the institutional codes and discursive materials available to them. The idea that power and regulation shape teacher's identity is further supported by Butler's (1999) as cited by Jones and Kessler (2020), discussion of performativity in the creation of gender identity. Butler asserts that individuals are only able to work with the tools that are laid out for them by the regulatory influences present in their lives. Within this framework of institutional power and regulation, "teachers' identity work is done within a specific frame of possibility; "authority is attributed and installed . . . the very expectation [of being] ends up producing the very phenomenon that it anticipates". In addition, teachers may conduct their expected roles according to or defy the profession's standards. These identity components are vital considerations in the development of a teacher's professional identity.

To recap, a teacher's identity is:

1. Socially constructed involving institutional codes, discourses, and relationships.
2. Impacted by discourses of power and knowledge – in communicating what teachers should be and should do.
3. Connected to and enacted via emotions (which correspond import).
4. Dynamic (in constant negotiation with factors as mentioned above).
5. And reflective yet forward-thinking.

The pandemic is leading us to a new reality. As we move forward, we find ourselves in a liminal space of the new normal. Early works of literature on this topic discuss the impact of the pandemic spanning from social, economic, education, health, psychological, cultural, even philosophical. In education, the pandemic has resulted in a new reality where teachers are not entirely ready. Their identity needs a professional development program to ensure continuity of service and commitments. This literature review digs into the pandemic's impact on teachers' professional identity and what elements are needed in professional development to reshape them for the new normal.

Research Questions

In general, this describes the impact of the COVID 19 pandemic on teachers' professional identity and determines the elements needed in professional development to prepare teachers in the new normal. Specifically, this review of literature will answer the following question;

1. What impact does the pandemic have on a teacher's professional identity?
2. What elements are needed to develop a teacher's professional identity in the New Normal?

Methodology

This paper employs content analysis of selected literature published online under the significant concept of COVID 19 pandemic, impact on teachers' professional identity and the sub-idea but essential topics of the liminal space and the new normal. Those are also the keywords used in searching for the articles. It used Google Search and Open Athens account at the University of the Philippines Los Baños to gather ten reports for the analysis. Other relevant documents were also included to comprehensively support the discussion of the results of the content scrutiny. The following criteria were considered in compiling the major articles in this study: the time-frame of publication, which is 2019 to 2021, and published online in educational journals.

Results and Discussions

While numerous articles have been searched through Google and Open Athens for the keywords used, only limited papers were found to be relevant to this study's research questions. From these little papers, ten were selected for analysis. These chosen articles are expected to respond to the study's objective, which is to determine the impact of the COVID 19 pandemic on teachers' professional identity and what elements are needed to develop this identity that will suit the realities of the post-COVID 19 education. The analysis employed covers only the title, the authors, publication details, and the significant findings or ideas generated/recommended.

The first article with the title, Strengthening Teachers' Professional Identities Through Faculty Development by Yvonne Steinert, Ph.D., Patricia S. O'Sullivan, EdD, David M. Irby, MDiv, Ph.D., claims that "faculty development programs or activities can awaken, strengthen, and support a teacher's identity." Activities or longitudinal programs involving networking and communities of practice, reflection, mentorship, identity workshops, and organizational support can be implemented to promote and sustain teacher's identity. As cited in this paper, Lieff et al. have pointed out that "educational leaders and faculty developers should be aware of the personal, relational, and contextual factors that can positively influence the growth and development of teachers' identities." This paper has also firmly pointed out that a "strong sense of identity can help direct the selection of professional development and educational leadership opportunities as well as career choices." Monrouxe's assertion that a solid professional identity enables individuals to practice with confidence and a "professional demeanor," thereby giving others confidence in their abilities, was also cited by the authors to support their study result. In the end, the study also declares that "faculty development programming can play a critical role in addressing and strengthening faculty members' identities and can help teachers to excel and thrive."

While this paper did not include the current pandemic situation in their discussion, it clarified that teachers' identity is a shared responsibility between the administration and the teachers themselves. As teachers' identity can be influenced by social and professional events, which may be programmed or otherwise, administrators and institutions should have a high level of awareness of the significance of these activities on teacher's identity development.

The second paper with the title, What kind of educator does the world need today? Reimagining teacher education in post-pandemic Canada, Cher Hill, Paula Rosehart, Janice St. Helene, and Sarine Sadhra reveals that "the pandemic has highlighted the need to re-envision teacher-education in multiple ways. This includes addressing and dismantling racism and systemic inequities within our educational systems, prioritizing mental health and wellness in schools, decolonizing teaching and learning and developing new models of education, building reciprocal relationships with the natural world, and recognizing and valuing teachers as knowledgeable professionals and community leaders." The paper suggests that these issues frame our vision of teacher education in the post-pandemic era.

The third paper, A critical reconceptualization of faculty readiness for online teaching by Ramona Maile Cutri & Juanjo Mena, analyzes two forces that produce and constrain faculty's experience in online education. It was highlighted that pandemic accelerated the use of online learning tools where teachers generally have issues on readiness.

The study emphasizes that structural forces influence teachers' experience in online teaching. For example, traditional rank and advancement in academia are based on scholarship rather than teaching innovation, and transitioning to online education is time-intensive, and permanent and contingent faculty can find this time comes at the expense of other responsibilities such as citizenship and scholarship. On the other hand, cultural forces also constrain faculty's transition to online teaching, for example, the clash between the traditional cultural milieu of academia and the intense emotional responses that faculty can experience in this process. The paper concludes that critical consideration of these structural and cultural forces contributes to a more nuanced understanding of faculty's experiences transitioning to online teaching.

The following paper, COVID-19 and its effects on teacher education in Ontario: a complex adaptive systems perspective by Shirley Van Nuland, David Mandzuk, Krista Tucker Petrick & Terri Cooper, ascertains that the volatility, uncertainty, complexity, and ambiguity as attributes of complex adaptive systems are forcing educators to be more adaptable, more flexible, and more creative than they have probably ever been expected to be. Considered as a sign that we are all living on the 'edge of chaos - the 'sweet spot' for creativity and innovation according to Hasinoff and Mandzuk (2018), Kelly (1998), and Pascale, Milleman, and Gioja (2000), as cited. As the paper claims, teacher education programs in Ontario and the teachers they prepare will likely be stronger and more able to adapt to change than ever before.

In addition, the study also highlights that "access to effective online connection and support, educator professional development for online learning, conversion of face-to-face courses to successful online courses, and the recognition of student teachers' practical experiences are only a few of the issues that initial teacher education will continue to grapple with. Further research will need to be conducted on a variety of emerging topics such as the technology and new associated skills that teacher educators and their students will require in the future; and the tools needed to sustain learning goals and answer the 'big-idea essential questions' that will pervade education for decades to come".

The fifth paper, Teachers' Emotion and Identity Work During a Pandemic, by Alexis L. Jones and Meghan A. Kessler, highlights the public's misunderstanding of the COVID-19 related conversations about education and how teachers work while on a lockdown and the refusal to go back to the classrooms during the partial opening of the schools as part of stimulating the US economy. The ongoing changes in the educational landscape and the absence of established social norms and the standards of the profession teachers align themselves with created something of a crisis of identity. Therefore, as the paper concludes, "it is imperative that teachers, teacher educators, policymakers, and others advocate on behalf of teachers. Now, more than ever, we must be mindful of the outsized expectations that may be placed on teachers and the resourcing necessary to support them. Anything less would undermine teachers' emotions, agency, identity, and capacity to take action on behalf of their most beloved commitments. The professional knowledge, practical experience, and voices of teachers should not be discounted, lest teachers are left unnoticed and disposable".

The sixth paper with the title, Analyzing the Impact of COVID-19 on Education Professionals. Toward a Paradigm Shift: ICT and Neuroeducation as a Binomial of Action by Luis Espino-Díaz, Gemma Fernandez-Caminero, Carmen-Maria Hernandez-Lloret, Hugo Gonzalez-Gonzalez, and Jose-Luis Alvarez-Castillo, establishes that a paradigm shift in education is going on that goes beyond the merely methodological. ICT has gone from a methodological resource to a necessary solution. This transformation affects the teaching profession by requiring education professionals to adapt to the new situation. The study affirms that the teacher's role in effectively using ICT tools in the teaching-learning process after the pandemic is essential.

The seventh paper, The COVID-19 pandemic and its effects on teacher education by Maria Assunção Flores & Anja Swennen reveal that the influence of the COVID 19 pandemic on a global scale has shocked teachers at all levels and at the same time inspired them to find solutions to problems they have not encountered before.

The eighth paper, Teacher Well-being During a Pandemic: Surviving or Thriving? by Anna Dabrowski, exposes that teacher's well-being is a matter of urgency. It is important to note,

There are significant reasons why schools should ensure teachers' well-being. For one, it contributes to work satisfaction, productivity, and most importantly, demonstrates a positive influence on the levels of student's well-being and academic achievement, according to Spilt et al., 2011 as cited. In addition, research also indicated that improving school performance has a positive impact on school well-being. Improving teacher's well-being also improves student outcomes, as cited in Briner and Dewberry (2007).

The ninth paper, The "new normal" in education by Jose Augusto Pacheco, claims that the pandemic has moved the curriculum online. COVID 19 also accelerated the existing trend that can be summarized as technologization – a development already well underway fueled by commercialism and reigning market ideology. In addition, the pandemic made the public space of education disappear into the pre-designed screen space that software allows. The machine now becomes the material basis for curriculum, not any more persons. The paper continued to claim that the pandemic curriculum becomes embedded in devices that technologize our children. While the report acknowledges the vital role of technology in the new normal, it also emphasizes that still, the design of the curriculum should focus on the humanistic side of society, providing greater importance for the involvement of learners and people in the conduct and implementation of the curriculum. Hence, the paper suggests taking time and slowdown in dealing with transforming educational resources and processes into technologies of today and the future.

The tenth paper, A professional development process model for online and blended learning: Introducing digital capital by Brent Philipsen, provides a framework for developing teachers' online teacher identity. The study underlines that in teaching online or blended, it is not only the teacher's knowledge base that will be considered but also the OBL (online and blended learning) related connections and networks together with societal dispositions with OBL. In other words, and in relation to the present study, developing online teacher identity-which is just one of the many identities of teachers, through a professional development program, should involve teacher's digital capital, which is the combination of all knowledge, skills, and attitudes complemented by their personal and professional social networks or relationships, which influence their engagement with technology.

The paper argues, that even before the pandemic, the teaching profession already faces unique challenges and pressures from its stakeholders and a constantly changing educational system; the COVID 19 pandemic will likely lead to further anxiety and weariness among teachers. Since teachers' well-being directly influences their identity, they need help as they continue to support students during the lockdown. The study suggests that it is imperative that whatever teachers have done during this pandemic should be recognized. Hence, in promoting teacher's well-being, teachers' voices should be heard and be part of a broader conversation on how schools and schooling shall continue beyond the pandemic.

Impact on Teachers Professional Identity

As Pacheco (2020), the ninth paper described earlier, puts it, the pandemic has changed everything, and no one could prepare. COVID 19 has disrupted the flow of time and unraveled what was normal. Citing Zisek (2020), the emergency restarted time creates radical ruptures and imbalances and brings about a contingency that becomes a new necessity. Our reality has been questioned as the pandemic reshuffled our needs and ways and imposed new order. This reshuffling and even mixing like the convergence of work, home, and learning spaces described in the initial pages questioned the ontological perceptions of teachers, which consequently impacted teacher's identity.

The seventh paper by Assuncao (2020) et al. explains that the reality resulting from the COVID-19 crisis not only raises questions about the nature of teaching and ways of supporting the learners, it "also challenges teacher education to (re)think ways of (re)educating teachers for scenarios that are unpredictable and unknown." Subsequently, this reality has required the development of new personal, social, and professional skills.

Espino-Diaz (2020) et al., in the sixth paper, describes that the abrupt transformation of teaching activity from the face-to-face model to the online modality reveals the existence of three gaps: the access gap (having or not having access to connection and technological devices); the use gap (time of use and its quality); and the gap in teacher skills, availability of resources, and adaptation of online platforms to support teaching). These gaps directly affect the teacher's self-efficacy; hence, the performance and motivation to perform his duties and responsibilities also suffer. This poor performance of teachers, if not correctly addressed, will provide a significant obstacle towards developing a teacher's professional identity. For this reason, these gaps should be considered when designing a professional development program for teachers.

This new reality (Pacheco, J.A., 2020), the need for new skills (Assuncao, 2020, et al.), and the gaps (Espino-Diaz, 2020 et al.) that emerged as an unavoidable effect of the pandemic directly disrupted teacher's professional identity. The overall theme of teacher's identity disruption revolves around the transition from classroom to online teaching. As already mentioned, this transition displaced teachers from their usual conceptual spaces. It forced them to work on a new area they are unfamiliar with yet, where their skills are insufficient, and where they do not identify themselves. The mere transfer of courses online disrupts teachers' identity, as the Johnson et al. (2014) study confirms. The same study also asserted that teachers face-recognizing potential discontinuities between who they are as face-to-face instructors and who and how they will be as online instructors. Meanwhile, the stress related to no longer being within one's area of expertise must be resolved during the transition to online teaching, as emphasized by the study of Golden (2016). In addition, Golden and Brown (2016) pointed out to ensure that the affective and behavioral aspects of the comprehensive experience of changing from a face-to-face teaching format to an online format must be considered.

Moreover, citing Sockman and Sharma (2008) from the third paper of Cutri (2020) et al., A Critical Reconceptualization of Faculty Readiness, teachers' emotional resistance to online learning as a pedagogical and implicit power shift, stems from the distaste for feeling like novices again. Feeling powerless and disoriented as teachers are required to master a new skill supports the idea of their hesitation and resistance to shift into online teaching. Sockman and Sharma (2008) suggested that teachers assume a humble stance toward online learning, although such humility undermines the teaching profession's competitive and peer review structure.

All of these disruptions in the traditional practices in education come as a challenge from the digital phase of education. This is a vital consideration because teachers are being compromised and taken vulnerable if not appropriately addressed in professional development support for teachers.

Summing it up, the impact on teachers' identity includes the evolving realities, (Pacheco, 2020), new spaces which require new skills - personal, social, and professional (Assuncao, 2020), et al.; and resulted in 3 gaps (access, use, and skills), Espino-Diaz (2020) et al; which made teachers feeling novices again, Cutri (2020) et al. Hence, a professional development program to reshape teacher's identity is irrefutably desired.

Remaking Teachers Professional identity in the New Normal

Steinert (2019) et al., the first paper previously described, confirms that faculty development programs can be used to explore and strengthen faculty members' professional identities. As professional identities exert a powerful influence on teachers' choices of professional roles, academic productivity, motivation, and satisfaction, a pre-designed short-term or longitudinal program should be implemented to help teachers achieve excellence in teaching and learning. Yet, the study finds that most faculty development initiatives reported in the literature focus primarily on improving teaching and learning (Steinert, 2016 et al.); they rarely address professional identity. In light of the challenges of the pandemic and the new role, teachers are assuming that faculty development support must be extended to all teachers. These programs should include all activities teachers pursue to improve their knowledge, skills, and behaviors as teachers and educators, leaders and managers, and researchers and scholars, in both individual and group settings, the paper suggests.

In crafting a strategic faculty development program, Lieff et al. (2012) identified three factors that can influence identity formation in longitudinal programs. These are personal factors (which include cognitive and emotional aspects unique to the individual), relational factors (which comprise connections and interactions with others), and contextual factors (which refer to the program and the external work environment). The study also has pointed out that educational leaders and faculty developers should be aware of the personal, relational, and contextual factors that can positively influence the growth and development of teachers' identities.

The second paper included in this study by Hill (2020) et al., What kind of educator does the world need today? Reimagining teacher education in post-pandemic Canada provides a frame of vision teacher education should be in the post-pandemic era in Canada and maybe in the global arena. The study stipulates critical issues that should make up teacher education in the future.

This includes the:

1. Need to dismantle racism and systemic inequities within the educational systems.
2. To prioritize mental health and wellness in schools.
3. To broaden and decolonize mainstream conceptions of teaching and learning as well as access to education.
4. To build caring reciprocal relationships with the natural world.
5. To recognize teachers as researchers and community leaders.

This could also be what professional development programs for teachers in the future shall cover. The pandemic highlights that these issues will create a new professional identity for future teachers once addressed and integrated into the curriculum.

Similarly, paper number four by Nuland (2020) et al. examines some of the significant challenges that teacher educators face as they struggle to reimagine teaching and learning remotely. Using the lens of 'complex adaptive systems, exemplified by the VUCA future, the study tallied vital teacher education issues that need to be answered if it should hold out hope for the future. These issues, as enumerated earlier, are significant inputs for the development of the professional identity of teachers in the indefinite future.

In developing a teacher's professional identity in the new normal, paper number five by Jones & Kesler (2020) uses the concept of teacher agency and tension to explicitly describe the challenge on teachers' identities during the pandemic. It contends that teachers' traditional identity and core motivation are shaped in the idea of the capacity to make a difference in children's lives and help individuals achieve lifelong success. This inspiration stems from the professional expectation that teachers can construct learning environments and lessons that address the child's needs. The commitment to perform a teacher's identity is called the leveraging agency. Zembylas (2003), as cited, describes the agency as the connection between identity and emotions. In a post-structuralist perspective, teacher agency is "contingent upon the cultural, historical, and policy dynamics in which a teacher is situated. The viability of teacher agency impacts teachers' capacity to enact their commitments and, therefore, feel that their identities are being realized". This agency, hence, teacher's identity has "certainly been severely impacted by the pandemic."

The sudden shift to online teaching, unprepared and unprepared, teacher's agency and identity should have been under tension and were left feeling uncertain and inadequate. In a relevant study, Connelly, and Clandinin (1999), as cited, assert that teacher identity and practice are interwoven. This means that a significant reform or unexpected change in teaching practices can cause a feeling of loss. This consequently requires that teachers adapt or resist their constructed identities or stories to continue or live by. It is, in fact, excellent managerial practice in dealing with subordinates when they resist the introduced change to take it as resistance not with the change but to the "losses" they get. As proven by Clandinin and Connelly (1996), they "point out that while others may see teachers as simply resisting or subverting new knowledge or reform, teachers are instead reacting according to their narrative understandings of selves, schools, and students."

Hence, suddenly shifting to online teaching constitutes a change in how teachers know their classrooms and themselves. The pandemic completely disrupts teacher's professional landscape and, therefore, their own professional identities. Professional development or any intervention should focus on re-affirming the boundaries that would enclose teachers' professional and personal agencies to remake such disrupted identities. Using the theoretical constructs of the aforementioned post-structuralist theory of teacher agency, if cultural and political discourses set the boundaries for what is possible, "teachers learn to internalize and enact roles and norms assigned to them by the school culture through what are considered 'appropriate' expressions and silences" (Zembylas, 2003). In general, setting the right policy and an inclusive strategy may help teachers regain an assemblance of the former selves of their identities. Their agency usually acts within existing frames of possibility or appropriateness, which are determined by the "discursive environments that set the conditions of possibility" for those actions and identity work (Zembylas, 2003).

With tensions and uncertainty on teacher's agency might be a problem for teachers at the moment, article number eight of this literature review by Dabrowski (2020) commends the prioritization of teacher's well-being while the pandemic is still on its way. To ease the current difficulties, the study identifies two key areas of focus for school systems, leaders, and teachers:
(1) fostering self-determination and agency and (2) building collective efficacy and social capital. The recommendation is based on the premise that "making changes in individuals when the system is part of the problem leaves basic structures intact and is unlikely to affect the problem... policymakers should consider making changes for teachers rather than in teachers" (Berryhill et al., 2009).

Finally, the last paper included in the analysis of this study by Philipsen (2019), articulates a model that can be used to frame a professional development program for teacher's identity. Focusing on the professional development of an online teacher, the model sets components based on change processes on the implementation of the professional development program. Remaking a teacher's professional identity is a priority to enable teachers to navigate through the liminal space of the new normal. There are enough elements and justification now, from the analysis of the literature, in which a professional development program can be designed.

Elements Needed for Teacher's Professional Identity Development in the New Normal

The literature analysis in the previous section identified several elements that should be included in the professional identity development for teachers in the new normal. These elements include personal, relational, and contextual factors, Steinert (2019) et al.; structural and cultural forces, Nuland (2020) et al.; teacher's agency, Jones & Kesler (2020); access, use, and skills gap, Espino-Diaz (2020) et at.; and fostering self-determination and agency and building collective efficacy and social capital, Dabrowski, (2020).

Moreover, the 10th paper by Philipsen (2019) suggests that online teaching identity is crucial for a teacher's professional identity in the new normal. Therefore, the teacher's knowledge base on OBL – Online-Blended Learning and the related connections and network, social dispositions, and digital capital must be included. However, all of these elements can be covered in the categories of personal - cognitive and emotional aspects unique to the individual; relational-comprises connections and interactions with others; and contextual factors, which refers to the program and the external work environment. These elements promote that professional development programs for teacher's identity should revolve around them.

Process Model for Teachers Professional Identity Development in the New Normal

Two things have been cleared out from the analysis of the literature included in the present study; (1) the COVID 19 pandemic has disrupted the professional identity of teachers, and (2) professional development is recommended to prepare teachers to be ready for the job that is still evolving. Hence, using this information from the identified components and coverage of professional development, a process model is presented and the subsequent elaboration of how it is designed.

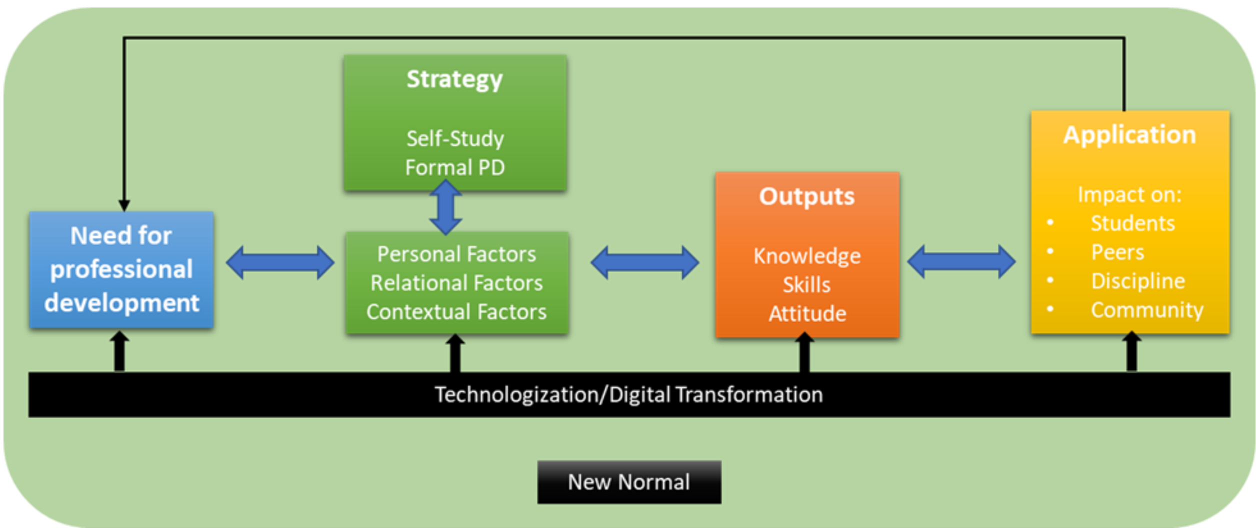

Figure 1: Professional Development Process Model for Teacher's Identity in the New Normal

Step 1 Need for Professional Development

The first step in this process model is to determine the relevant need for professional development as confirmed by the studies of Knowles et al. (2015), King and Lawler (2003), and Philipsen, Tondeur, Pareja Roblin et al. (2019). Meanwhile, Clarke and Hollingsworth (2002) mention the presence of stimulus to commence a teacher's professional development program. The stimulus being referred to in the study can be a personal need when teachers' competencies are no longer sufficient with the current demands. Another stimulus is a high-level policy initiative that requires training or major adjustments to the existing practices. On the other hand, events like the COVID 19 pandemic, as discussed in this paper, can elicit both a personal need and a high-level reform that should merit a need for a professional development package for reasons and justifications earlier presented.

Step 2 Strategy

The next step involves the actual professional development program, which is presented in two options: self-study or formal program. The option to take a self-study or a formal program depends on the need identified in the previous step.

A professional development program for teacher's identity should incorporate the factors, components, and perceived necessities identified or recommended by the literature discussed in this study. More importantly, this model proposes to consider the following components to be included in the program:

1. Personal factors which include the cognitive and emotional aspects unique to the individual;
2. Relational factors comprise the connections and interactions with others;
3. Contextual factors refer to the program and external environment (Steinert, 2019 et al.)

Step 3 Expected Output

The third step in this proposed process model is the expected outputs from the professional development program received. These are the changes that teachers should exhibit
after their participation and engagement in the designed program. Evans (2014) identifies these changes related to a behavioral change, an attitudinal change, an intellectual or cognitive change. Relating this to the objective of the present study, these expected changes should involve any of those components or issues needed for the new normal. While there is an opposing view on how teachers change, whether teachers change their practice first and then attitude or the other way around Guskey (2002), Consuegra and Engels (2016); the theoretical foundations of behavioral change contend that this order is interchangeable.

Step 4 Application and Impact

Once teachers' practices and/or behavior have changed, restoring normalcy on teachers' professional identity and performing their duties excellently, the professional development program should conduct an assessment to look into the impact on students, peers, discipline, and the community. This is also an opportunity to see whether the program is appropriately designed or requires a modification which could mean that the process could go back to Step 1.

External Factors

The proposed model identifies two external elements involved throughout the entire process that should be considered in every step of the procedure. These are the technologization or digital transformation and the new normal. As earlier discussed in this paper, as the pandemic forced the creation of a new reality and the new normal slowly evolves, technology drives the transformation; hence, these two should be incorporated in every step of the process.

Summary

The ultimate impact of the COVID 19 pandemic is the reshaping of what we perceive as normal. The sudden shift to online learning as schools were closed caught teachers unaware and unprepared. This event tremendously impacted teachers' professional identity, leaving them to adapt, resist, and/or renegotiate with the new reality. Teacher's loss of access to the physical structure of their workplaces, the conduct of online classes at home while at the same time attending to the demands of their family and other responsibilities were some of the unexpected results when boundaries of home, workplace, and learning spaces were converged.

The pandemic, however, made it clear that the new normal is dominated by technology – at least in education. Social norms will be defined by how and what technology is integrated with them. The convergence of traditional spaces challenged teacher's ontological beliefs of the present reality – requiring a redefinition of a new reality along the way. At the onset of the new normal, teachers are suspended in the liminal space between the old and the ongoing present. In this space, teacher's professional development must focus on building a professional identity defined by the demands and realities of the new normal.

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Sweet Spots for Qualitative Science: Basis for Stem Qualitative Research Policy

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Abstract - In the Philippine K-12 Basic Education Curriculum, Research in Daily Life 1: Qualitative Research is offered as an applied subject across all tracks and strands. This implies that researching qualitatively is positioned as an essential 21st-century skill. The challenge arises when teachers and students contemplate the needed topics to be researched since scientific research is highly quantitative. In past implementations, compromises were made to cover scientific phenomenon explained using qualitative methods in which findings and results are difficult to analyze. As this problem continues, this research aims to unravel the possible areas in which both scientific research as a theme and qualitative method as a design will meet. In this study, the Research in Daily Life 1 teacher-researchers of Senior high school STEM collated the approved topics of all the students. The topics were presented to science research teachers to determine the possible areas of scientific research in which qualitative methods can be used. The responses of the science research teachers were coded to determine the emergent themes. It was found out that a) qualitative design is necessary for science, b) problem orientation in research should be emphasized, c) the objectives of the scientific research should be given focus, not the design, and d) environmental and other relevant issues should be emphasized in future researches. The generated themes were considered in developing a proposed research policy for STEM qualitative research to solve the problem seemingly.

Keywords - STEM qualitative research, Research in Daily Life 1, STEM Qualitative Research Policy, Qualitative Research, Scientific Research

Introduction

According to Creswell (2013), qualitative research is a vital means of discovering life's nature. Currently, there are numerous journals, web-based resources, conferences, books, and academic courses devoted to this form of inquiry (Creswell, 2013; Saldana, 2011; Miles, Huberman, & Saldaña, 2014; Bernard, Wutich, & Ryan, 2016). Great topics and disciplines attest to the popularity of qualitative research in various files such as counseling, health, tourism, management, and all levels of education (Corbin, Strauss, & Strauss, 2015; Holton, 2011; Saldaña, 2016). Qualitative data has become a standard indicator in academic development and policymaking in international settings (Wutich, & Ryan, 2016; Creswell, 2013; Saldana, 2011). Yet, there are fields in qualitative research that remain untouched (Trinidad, 2018) because of their humanistic nature (Creswell, 2013). According to Trinidad (2018), the "contemporary Philippine society needs a lot more research on different ideas and areas (p.25)." This quotation and many more were left unsaid about qualitative research. This reminds us that there is a great need for knowledge to be continuously produced and discovered and for learning to expand and flourish the research on Philippine realities constantly.

Challenges to researching Philippine realities include the relatively small amount of published materialized areas of knowledge (Trinidad, 2018), like scientific research using qualitative methods (O'Connor & Cargill, 2013; Dochartaigh, 2012). Scientific research has its discipline, as it is defined as the systematic investigation of scientific theories and hypotheses (Barrot, 2016; Cristobal & Cristobal, 2017; Del Rosario-Garcia, 2017; Trinidad, 2018; Rapley, 2011). A hypothesis implies testing it using statistical treatment (Miller-Cochran & Rodrigo, 2013; Devlin, 2017). The aim of scientific research, quantitatively, is to understand the magnitude of a scientific phenomenon (Trinidad, 2018) by testing the hypothesis (Treiman, 2014; Cristobal & Cristobal, 2017, Del Rosario-Garcia, 2017; Trinidad, 2018), the relationship between variables (Kanire, 2012; Nadal, 2011; Holland, 2013; Stage & Manning, 2015), and making predictions (Barakso, Sabet, & Schaffner, 2013). An example is when a researcher aims to develop a bioplastic made out of banana peelings (Mohapatra, Prasad, & Sharma, 2014; Mohamed, n.d.; Ghamande, Kulkarni, Shah, Kothari, & Bhosale, 2018; Treiman, 2014). To test the hypothesis, he needs to have the necessary variables (independent, dependent, control) and a statistical treatment via experiment (i.e., testing the durability, etc.). The data, as opposed to the typical qualitative research methods (surveying, quasi-experimental design, correlation) and qualitative research, come from subjects other than people (Schutt, 2013; Talmon-Heller & Cytryn-Silverman, 2014; Onwuegbuzie & Frels, 2016). This is by which the opposite of researching realities. This very nature of scientific research makes it almost impossible for qualitative research to come in. The study of Devetak, Glažar, Vogrinc (2016) suggests that those authors have been using qualitative and mixed research approaches in more than half of the published papers in the science in the last three years to address the research questions in their studies. This claim may further develop specifically in the senior high school research to enhance qualitative methodologies in science. The Philippine K-12 curriculum is more likely to practice qualitative research in a scientific setting via the Research in Daily Life 1: Qualitative Research subject.

We cannot deny the difficulty of forcibly combining qualitative research design in a scientific setting, as they are entirely different. However, it may ease out the difficulty of topic generation and be a unique guide in creating qualitative research in the sciences with the help of a qualitative research policy (Gibton, 2016; Creighton, 2006). This study attempts to look for promising areas, “sweet spots,” for both scientific and qualitative research to fill in DepEd’s goal of qualitative science researches (DepEd GC, 2016). Early iterations of this practice suggest that some specific fields and perspectives cover the mentioned sweet spots. Hence, this study aims to determine the workable areas of research for STEM qualitative research.

In addition, this paper seeks to answer the following questions:

1. What makes the qualitative method difficult for scientific research?
2. What themes were generated from the approved topics of the STEM senior high school students?
3. What are the research areas possible for STEM qualitative research?

Methodology

This research is a humanistic-qualitative mixed-method design that aims to unravel the emerging themes from both the document analysis and coding-and-encoding of the interview data.

Figure 1. Research Paradigm

The research paradigm is illustrated as a cycle wherein there are no endpoints. This implies that the research process contributes organically with neither an end nor a start. In this research paradigm, there are seven circles. Each circle contains the detailed procedure of this research. Firstly, the approved topics of the Senior high school STEM students were acquired through a list. Secondly, the list was subjected to content analysis. Thirdly, the content analysis was presented to science research teachers via interview to determine their perspectives. Fourthly, the interview data were coded and encoded. Fifthly, the encoded data were subjected to thematic analysis to determine the theme of the participants' responses. Ultimately, a proposed research policy for STEM qualitative research was formulated. The proposed research policy will serve as feedback once used to formulate research topics for the next school year.

The paper used an interview guide to conduct a focus group interview with the participants. These are Science research teachers of the University of the East-Caloocan campus handling Grade 12 STEM Research Capstone subjects. They were chosen because they are practitioners of science research areas as well as teachers handling science subjects. Also, this study utilized the data from the document analysis were tallied and tabulated to determine the common areas of research based on the nature of phenomena, method, instrumentation, sources of data, and data analysis. These are the approved topics for STEM qualitative research that was used as the corpus of this study. This was analyzed to determine the themes in the topic selection done by the students. This corpus was presented during an interview with the science research teachers. The topics are from the Senior high school STEM students enrolled in Research in Daily Life 1: Qualitative Research were chosen because they are the direct beneficiaries of this study in which future STEM senior high school students of the subject above will benefit from the proposed output.

Results and Discussions

In this study, there are four themes generated from the interview of the senior high school science teachers which were: a) qualitative design necessary in science; b) the objectives of the scientific research should be given focus, not the design, c) problem orientation in research should be emphasized, and d) environmental and other relevant issues should be emphasized in future researches.

THEME 1: Qualitative design necessary in science

The participants came to an agreement that qualitative design is necessary for scientific inquiry. According to them, "qualitative research allows perspectives to come in as a necessary part of data analysis." This helps not only the science researchers but science practitioners like. One participant stressed that "it is possible. It is used in the field of nursing, and it is effective. It gives intangible data needed like patient's perspective." The only difference is that qualitative deals with data that cannot be described by quantitative research in a scientific inquiry such as statistical instrumentation and laboratory. They even stressed that what makes qualitative scientific is that, although "it is not strict to the research flow of the scientific methods, there are still steps. First, you need to have an established problem that you want to solve. Then, gather data from the existing body of knowledge and work on the data collection. Afterward, you start making a solution to that problem which will be your research." This suggests that qualitative research takes advantage of lived experiences and perceptions to solve an existing problem using scientific concepts.

The value of qualitative study comes from its focus on the participants' lived experience, which enabled the development of a greater understanding concerning the essential, relevant, and meaningful outcomes to the people involved (Devlin, 2017). Qualitative data may impart light to scientific inquiries that are hardly answered using the traditional quantitative research method. According to Mohapatra, Prasad, and Sharma (2014), scientific research is a research method that seeks to explain naturally occurring phenomena in the natural world by generating credible theories. It is a systematic process that involves formulating hypotheses, testing predictions using relevant data and other scientific methods, and finally coming up with a theory (Ghamande, Kulkarni, Nimish Shah, Sakshi Kothari, & Bhosale, 2018). As such, this study requires rational and statistical evidence to conclude. Moreover, this theme is supported by Devetak, Glažar, Vogrinc (2016), which suggests that authors have been using qualitative and mixed research approaches in more than half of the published papers in science in the last few years three years to address the research questions in their studies.

THEME 2: The objectives of the scientific research should be given focus, not the design

The participants believe that all research, regardless of the topic, can be collected and interpreted quantitatively. According to them, "researchers may collect primarily using quantitative means and then explore [triangulate] using the qualitative method of data analysis." To them, any data proving or disproving any scientific theory will give justice to scientific inquiry. The issue that should be addressed is not the research design but its goals. To them, curiosity, the basic foundation of scientific inquiry, cannot do justice in doing scientific research. A researcher should meet the objectives or goals to improve daily living.

The participants stressed that the sources of data are the most crucial indication of the findings. To them, "as long as the precise participants are purposively selected, the research topic is workable. Since most of the topics [referring to the topic matrix] are phenomenology, they investigate phenomena based on the participant's perception. To make the findings valid, they need to make sure that the selected participants are aware of the phenomena since they will be the sources of data." This statement suggests that teachers and students of research should check whether the instrumentation truly seeks data needed to meet the goals of the scientific inquiry. To them, the collected data is precis to make the analysis valid. They cited that "there might be instances in which their participants do not match the data needed. For instance, [referring to one topic] what should be selected are those parents [participants] affected by the vaccine scare." The question should be asked according to them is "let's say they have an interview guide, does the interview guide aligns to their aims?" They all agreed that the problem statement to the research instruments to the participants' responses down to data analysis. The findings are essential if the goals and objectives of the research are indeed met.

Creswell (2013) suggests that the researchers need to establish a clear relationship among all the essential parts of a research. There is a need to refine the topic and clearly state what is intended to explore. Formulation of the research problem includes narrowing down the research area and formulating the objectives. Therefore, the objectives should be addressed by the sources of data collected using a validated instrument (Devlin, 2017). Trinidad (2018) added that qualitative research should be focused on a particular reality: a text, phenomenon, social issue, event, or organization. It should not be motivated by a discipline or subject area but by the understanding of an experience.

THEME 3: Problem orientation in research should be emphasized

The participants claim that the problem orientation in research should be emphasized in any scientific inquiry regardless of design or method. They suggested that the primary way of being aware of the problem is two-fold: by observation and building the literature review. They cited, "what usually happens is that they create hunches that do not have bases. For example, vaping is a means of therapy. What I usually ask is the study was conducted prior.

Secondly, "researchers should base their problem using observation. If they become aware of the problem, they must conduct a thorough observation." They even supported it with scientific concepts such as novelty, in which they emphasized that "it should add up to the current body of knowledge, not just for it to exist." For qualitative to be scientific, there should still be an output for the problem, utilizing scientific concepts. They stressed that "if you are doing scientific research, you should be able to generate new knowledge, develop or improve a theory, or come up with a product that is something beneficial to the community." This suggests that scientific research should be problem-based.

Trinidad (2018) posits the advantage of problem-based research in senior high school can help integrate different perspectives from one issue to another. This enables the research to become flexible in working on a particular interest. It requires familiarity with different perspectives and insights from the participants. This means that the researchers should be able to choose relevant information to be incorporated into scientific inquiry, which also enlightens the validity problem posted in the second theme of this research.

THEME 4: Environmental and other relevant issues should be emphasized in future researches

When asked about the possible topic for research, the participants started their discussion about the primary indicators of determination, such as the "inclination of the topic, their interest, and what they are passionate about," which should be the start of the topic selection. They even mentioned that any topic in scientific inquiry is workable as long as it is incorporated with scientific concepts to explain a phenomenon.

Going into the question, they suggested topics that are needed, like environmental issues. According to them, "the focus of future researchers should be based on the needs and problems of the society such as "pollution of many kinds [plastic pollution, air pollution, water pollution, etc.)." Also students of research may work on the topic in which they can develop prototypes such as in "physics and engineering." However, according to one of the participants, they can contribute to the field of medicine in which strives in the field of qualitative science. He cited "nursing, which is still broad, probably pain management, psychiatry, etc.). They even cited specific research topics like "mother's concern in pregnancy and breast-feeding as a crucial stage of babies' development" and other topics that would involve snowballing (snowball sampling). Thus, any scientific inquiry field can be accompanied by this design to describe and analyze data that cannot be quantified. They recommended, however, that topics towards the environment should be emphasized because it is the most concerning global issue to that and that a lot of researchers in the field of inquiry have been occupied locally in the college and graduate levels.

Trinidad (2018) noted that the "contemporary Philippine society needs a lot more research on different ideas and areas (p.25)." This quotation and many more were left unsaid using qualitative research. This reminds us that there is a great need for knowledge to be continuously produced and discovered and for learning to expand and flourish the research on Philippine realities constantly.

Conclusion and Recommendations

It was found that qualitative research design comprises tedious research methods such as interviews, document analysis, and coding, which are different from the conventional scientific methods. In this study, there are four themes generated from the approved topics of STEM Senior high school students, which were: a) qualitative design is necessary for science, b) problem orientation in research should be emphasized, c) the objectives of the scientific research should be given focus, not the design and d) environmental and other relevant issues should be emphasized in future researches.

In the first theme, the science research teachers emphasized the importance of qualitative design in scientific inquiry. Though scientific research is purely quantitative, there are still areas of inquiry that cannot be quantified.

In the second theme, the science research teachers argue that the problem orientation in research should be emphasized in any scientific inquiry regardless of design or method. They highlighted that research would only be helpful only if it answered a relevant issue. Both the teachers and students should understand that the foundation of scientific research is grounded on the problems faced by society. Both entities should be able to build on that foundation to advance the field of scientific inquiry further.

In the third theme, the science research teachers downplayed the importance of research design to approve a topic in scientific research. Instead, they emphasized the importance of the linear relationship among the parts of the paper, such as the statement of the problem to the research instruments to the participants' responses down to the analysis of data. The findings are essential if the goals and objectives of the research are indeed met.

The fourth theme adheres to the previously generated themes. The science research teachers established the fact that qualitative design is necessary to scientific research. Thus, any scientific inquiry field can be accompanied by this design to describe and analyze data that cannot be quantified. They recommended, however, that topics towards the environment should be emphasized because it is the most concerning global issue to that and that a lot of researchers in the field of inquiry have been occupied locally in the college and graduate levels.

Based on the themes emerged from the analyzed data, this study recommends the following: a) the use of qualitative method should be encouraged in the field of sciences for data triangulation; b) the teachers and students of research should both understand the linear relationship among the crucial parts of research such as the statement of the problem to the sources of data to the instrumentation to the analysis of data, to the formulation of the solution; c) problem-orientation should be emphasized in a topic generation to ensure the relevance of the topic to the field of scientific inquiry; d) environmental and other relevant issues should be addressed in future research topics. More importantly, the researchers propose to create a research policy for the next three years that addresses the challenges raised by the science research teachers (checking the conception of the research topic, phenomena, validity of the instrumentation, data collection, and analysis) in this research. This research policy will contain specific topics, methodology, instrumentation, data analysis, and outputs workable for qualitative research.

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Lebel ng Pagkatuto sa Paraang Flexible Learning ng mga Mag-aaral sa Panahon ng Pandemya

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Abstrak - Ang pag-aaral na ito ay naglalayong malaman ang lebel ng pagkatuto sa paraang flexible learning ng mga mag-aaral sa panahon ng pandemya ng Batsilyer ng Edukasyong Sekondarya, midyor ng Filipino, Iloilo Science and Technology University, Miagao Campus, unang semestre taong panuruan 2020-2021. Paraang palarawan ang metodong ginamit sa pag-aaral. Gamit ang tseklist inalam ang lebel ng pagkatuto ng mga mag-aaral sa paraang flexible learning sa panahon ng pandemya kung ipapangkat ayon sa kasarian, antas ng grado, istatus pang- ekonomiko, at lokasyong heograpikal. Ito ay ginawa ng mga mananaliksik at isinailalim sa balidasyon para matiyak ang pagiging balido at pagkamapanaligan ng mga ginawang instrumento. Mean, Frequency, Percentage at Standard Deviation ang ginamit sa pagtatalakay ng datos. Lumabas sa pag-aaral sa kabuuan, na ang mga tagatugon ay may mataas na lebel na pagkatuto sa paraang flexible learning sa panahon ng pandemya. Iminumungkahi ng mga mananaliksik sa lahat ng maaaring kasangkot sa pag-aaral na ito na ipagpatuloy ang nasimulang paraan ng edukasyon dahil kasabay ng pagbibigay ng katuturan sa kahalagahan ng edukasyon sa kabataan sa panahon ng pandemya ay mahalaang maisaalang-alang din ang kaligtasan ng mga mag-aaral, kung kaya't ang flexible learning ay isa sa mga mabisang paraan ng edukasyon sa panahon ng pandemya.

Susing salita - Lebel ng Pagkatuto, Flexible Learning, Mga Mag-aaral, Uri ng Flexible Learning, Panahon ng Pandemya

Introduksyon

Sa paglaganap ng pandemya sa bansa, isa na ang sektor ng edukasyon sa lalong nabahala, bunsod nito napagpasyahan ng buong sangay at kawanihan ng edukasyon na magsagawa ng alternatibong pamamaraan sa pagtuturo nang sa gayon ay hindi maantala ang edukasyon ng mga mag-aaral at matuloy pa rin ang taong panuruan 2020-2021. Isa sa mga ito ay ang 'flexible learning' na kung saan ito ay ang kombinasyon ng digital at hindi digital na teknolohiya na hindi nangangailangan ng pagkakakonekta sa internet. Ang 'flexible learning' ay isang inklusibo at abot-kamay na uri ng edukasyon na talagang angkop sa pangangailangan at istatus ng mga mag-aaral sa panahon ng pandemya. Sa ganitong paraan, matutukoy at mababatid ang antas at lebel ng pagkatuto ng mga mag-aaral gamit o sa tulong ng 'flexible learning' sa panahon ng pandemya. Hudyat nito, magkakaroon ng ideya't kaalaman ang guro at mga magulang sa estado ng pagkatuto ng mga mag-aaral ngayong nahaharap ang bansa sa nasabing krisis.

Metodolohiya

Disenyo at Layunin ng Pag-aaral. Ang disenyong ginamit sa pag-aaral na ito ay palarawang pamamaraan na naglalayong malaman ang lebel ng pagkatuto sa paraan ng flexible learning ng mga mag-aaral sa panahon ng pandemya ng Batsilyer ng Edukasyong Sekondarya, medyor ng Filipino, Iloilo Science and Technology University, Miagao Campus, unang semestre taong panuruan 2020-2021.

Ayon kina Gonzaga, et.al at binanggit nina Española (2018), ang palarawang pamaraan ng pananaliksik ay isang disenyo para sa mananaliksik upang makalap ng impormasyon tungkol sa kasalukuyang kalagayan. Ang pangunahing layunin ng pag-aaral na ito ay mailarawan ang kalikasan ng isang sitwasyon habang ito'y nagaganap sa panahon ng pag-aaral.

Ayon naman kay Aquino at binanggit nina Española (2018), ang paraang palarawan ay isang kapaki-pakinabang na metodo sa pagbibigay ng impormasyon o kaalaman na maaaring pagbabatayan ng mga maka-agham na paghahatol.

Mga Tagatugon sa Pag-aaral. Gamit ang sampling na may layunin, ang mga kalahok sa pag-aaral na ito ay ang mga mag-aaral ng Batsilyer ng Edukasyong Sekondarya, medyor ng Filipino, Iloilo Science and Technology University, Miagao Campus, unang semestre taong panuruan 2020-2021.

Manghad 1: Pamamahagi ng mga Tagatugon

Tagatugon	N = 86	Porsyento
Kasarian		
Babae	77	89.53%
Lalaki	9	10.47%
Antas ng Taon		
Unang Taon	37	43.02%
Ikalawang Taon	29	33.72%
Ikatlong Taon	20	23.26%
Istatus Pang-ekonomiko		
Mababa	69	80.23%
Katamtaman	14	16.28%
Mataas	3	3.49%
Lokasyong Heograpikal		
Barangay	81	94.19%
Poblacion	5	5.80%
Kabuuan	86	100%

Ang Manghad 1 ay nagpapakita ng pamamahagi ng mga tagatugon kung saan ang kabuuan ay walumpu't anim (86). Ang unang taon ay may 37 (43.02%), ikalawang taon na may 29 (33.72%) at ikatlong taon na may 20 (23.26%). Kung ipapangkat naman sa kasarian. Ang mga babae ay may 77 (89.53%); lalaki ay may 9 (10.47%). Kung ipapangkat ayon sa antas ng taon, ang unang taon ay may 37 (43.02%), ikalawang taon ay may 29 (33.72%) , at ikatlong taon ay may 20 (23.26%) . Samantalang , sa istatus pang- ekonomiko, ang mababa ay may 69 (80.23%), katamtaman ay may 14 (16.28%), at mataas ay may 3 (3.49%). Sa lokasyong heograpikal, ang barangay ay may 81 (94.19%), at sa poblacion ay may 5 (5.81%).

Mga Kagamitan sa Pagtitipon ng Datos

Ang mga datos na kinailangan sa pag-aaral ay tinipon sa pamamagitan ng inihandang tseklist ng mga mananaliksik na siyang ipinasagot sa mga mag-aaral. Ang tseklist ay hinati sa dalawa. Ang unang bahagi ay naglalaman ng personal na datos ng mga tagatugon na tumutukoy sa pangalan, kasarian, istatus pang-ekonomiko, lokasyong heograpikal, at antas ng taon. Samantalang, ang ikalawang bahagi ay ang pag-alam sa antas ng pagkatuto ng mga mag-aaral sa panahon ng pandemya sa paraan na flexible learning sa pamamagitan ng kanilang natamong grado sa mga medyor na asignaturang Filipino sa unang semester ng taong panuruan 2021. Ito ay dumaan sa masusing balidasyon upang mapatunayan ang pagiging pagkamapanaligan ng nasabing pag-aaral.

Paraan. Ang pag-aaral na ito ay isinagawa sa pamamagitan ng pagtitipon ng mga mananaliksik ng lahat ng kinailangang datos sa pamamagitan ng pananaliksik sa internet at pagbasa ng isang babasahin na may kinalaman sa flexible learning at pandemya, at pagsama- sama ng mga ideya upang makabuo ng instrumentong gagamitin sa pagkuha ng kakailanganing datos. Ipinasuri ng mga mananaliksik ang binuong tseklist sa mga eksperto o dalubhasa, tagapayo ng riserts ang balidasyon nito.

Gamit ang tseklist, tinipon ang mga nakukuhang datos at binigyan ng interpretasyon sa pamamagitan ng iba't ibang kagamitang pang-istadistikal.

Para sa pagtiyak ng lebel ng pagkatuto ng mga mag-aaral gagamitan ito ng mga sumusunod na iskala:

Iskala	**Deskripsyon**
1.4 – 1.0	Pinakamataas
1.9 – 1.5	Mataas
2.4 – 2.0	Katamtaman
3.0 – 2.5	Mahina

Pang-istadistikang Pagtatalakay ng mga Datos

Ang pang-istadistikang pagtatalakay ng mga datos ng ginamit sa pag-aaral na ito ay Frequency Distribution, Percentage, Mean, at Standard Deviation.
Frequency Distrbution – ang ginamit sa pagkuha ng kabuuang bilang ng mga tagatugon.
Percentage – ang ginamit upang malaman kung ilang porsyento ng tagatugon ang kabilang sa pangkat.
Mean - ginamit upang matukoy ang lebel ng pagkatuto ng mga mag-aaral
Standard Deviation- Ang ginamit upang masukat ang lawak ng pagkatuto ng mga tagatugon

Resulta and Diskusyon

Sa paglalarawan ng mga datos,Frequency distribution, Percentage, Mean, Standard Deviation.
Ang mga sumusunod na manghad ay nagbibigay patunay sa kinalabasan ng pag-aaral.

Manghad 2
Lebel ng Pagkatuto sa paraang Flexible Learning ng nga Mag-aaral sa Panahon ng Pandemya sa kabuuan

Baryabol	***N***	***Mean***	***SD***	***Deskripsyon***
Kabuuan	86	1.7	0.22	Mataas

Ang Manghad 2 ay nagpapahayag ng lebel ng pagkatuto sa paraang flexible learning ng mga mag-aaral sa panahon ng pandemya sa kabuuan. Ayon sa resulta nito, ang mga mag-aaral ay may mataas na lebel ng pagkatuto sa paraang flexible learning, (m =1.7 , sd=0.22).

Sinasang-ayunan ito sa pag-aaral ni, D.R. Robert Joan, (2013), na pinamagatang , " Flexible learning as New Learning Design in Classroom process to Promote Quality Education", na ang flexible learning sa silid-aralan ay nakakatulong sa pagtaguyod ng dekalidad na edukasyon, gayundin sa mga aktibidades ng mga mag-aaral.

Manghad 3
Lebel ng Pagkatuto sa paraang Flexible Learning ng nga Mag-aaral sa Panahon ng Pandemya kung ipapangkat ayon sa Kasarian, Antas ng Taon , Istatus Pang-ekonomiko,at Lokasyong Heograpikal

Baryabol	***N***	***Mean***	***SD***	***Deskripsyon***
Kasarian				
Babae	77	1.7	0.22	Mataas
Lalaki	9	1.8	1.18	Mataas
Antas ng Grado				
Unang Taon	37	1.7	0.19	Mataas
Ikalawang Taon	29	1.8	0.27	Mataas
Ikatlong Taon	20	1.6	0.14	Mataas
Istatus Pang-ekonomiko				
Mababa	69	1.7	0.23	Mataas
Katamtaman	14	1.6	0.15	Mataas
Mataas	3	1.6	0.14	Mataas
Lokasyong Heograpikal				
Barangay	81	1.7	0.23	Mataas
Poblacion	5	1.7	0.14	Mataas

Ang Manghad 3 ay nagpapakita na ayon sa Kasarian ang mga babae na mag-aaral ay may lebel na pagkatuto na mataas (m=1.7; sd= 0.22), ang mga lalakina mag-aaral naman ay may lebel na pagkatuto na mataas (m=1.8; sd= 0.18). Ayon naman sa Antas ng Taon, ang mga mag-aaral sa unang taon ay may mataas na lebel ng pakatuto (m=1.7; sd=0.19), sa ikalawang taon naman ang lebel ng pagkatuto ay mataas (m=1.8; sd=0.27), sa ikatlong taon naman ang lebel ng pagkatuto ay mataas (m= 1.6; sd=0.14) . Samantalang, sa Istatus Pang-ekonomiko naman ay ang mababa na kita ay may lebel na pagkatuto na mataas (m=1.7; sd= 0.23), sa katamtaman na kita naman ay may lebel ng pagkatuto na mataas (m-1.6; sd=0.15) at sa mataas na kita ay may lebel na pagkatuto na mataas (m=1.6; sd=0.14).Sa Lokasyong Heograpikal naman ang mga mag-aaral na nakatira sa barangay ay may lebel na pagkatuto na mataas (m=1.7.; sd=0.23), sa mga mag-aaral na nakatira sa poblacion ay may lebel na pagkatuto na mataas (m=1.7.; sd=0.14).

Konklusyon at Rekomendasyon

Paglalagom. Ang layunin ng pag-aaral na ito ay malaman ang lebel ng pagkatuto sa paraan ng flexible learning ng mga mag-aaral sa panahon ng pandemya ng Batsilyer ng Edukasyong Sekondarya, medyor ng Filipino, Iloilo Science and Technology University, Miagao Campus, unang semestre taong panuruan 2020-2021.

Paraang palarawan ang metodong ginamit sa pag-aaral na ito. Gamit ang tseklist inalam ang lebel ng pagkatuto ng mga mag-aaral sa paraang flexible learning sa panahon ng pandemya kung ipapangkat ayon sa kasarian, antas ng grado, istatus pang- ekonomiko, at lokasyong heograpikal Ang Istadistikang palarawang ginamit ay Mean (Katampatang tuos), at Standard Deviation.

Lumabas sa pag-aaral na sa kabuuan, ang mga tagatugon ay may mataas na lebel na pagkatuto. Ayon sa kasarian, lumabas sa pag-aaral na ang mga babae ay may mataas na lebel na pagkatuto, samantalang ang mga lalaki ay may mataas din na lebel na pagkatuto. Kung ipapangkat naman sa antas ng taon ang lahat ng antas, Unang taon, Ikalawang taon,Ikatlong taon ay parehong may mataas na lebel na pagkatuto. Samantalang ang resulta ng pag-aaral kung ipapangkat ayon sa istatus pang-ekonomiko ay parehong may mataas na lebel ng pagkatuto sa anumang antas ng pamumuhay na kanilang kinabibilangan. Sa kabilang dako,kung ipapangkat ayon sa lokasyong heograpikal, ang mga tagatugon ay parehong may mataas na lebel ng pagkatuto mapa- barangay man o sa poblacion ang kanilang tirahan.

Konklusyon. Ipinakita sa pag-aaral na parehong mataas ang lebel ng pagkatuto ng mga babae at mga lalaki. Maaaring sa kabila ng pagbabago ng paraan ng pagkatuto na tinatawag na Flexible learning sa panahon ng pandemya, ang mga mag-aaral ay hindi natinag at nagpakita pa rin ng determinasyon sa pag-aaral, dahil sa kabuuang resulta ng lebel ng pagkatuto na mataas, nagpapatunay lamang na ang mga mag-aaral ay hindi nagpabaya sa pag-aaral kahit anumang sistema o paraan ng pagkatuto ang ipapatupad sa ating bansa, at sa kabila ng ating kinakaharap na pandemya na idinulot ng COVID 19.

Kung ipapangkat naman sa antas ng taon ang lahat ng antas ay parehong may mataas na lebel ng pagkatuto.Maaaring ito ay nagpapatunay lamang na kahit anong antas man o walang basehan ang haba ng pinag-aralan ng mga tagatugon ay nangungibabaw pa rin ang pagpapakadalubhasa sa Filipino lalong-lalo na sila ay medyor sa Filipino. Dagdag pa, ang pagkakaroon ng positibong pananaw sa kinukuhang kurso sa gitna ng pandemya, at ito rin ay nagpapatunay na may determinasyon ang mga tagatugon isama na rin ang tamang desisyon sa pagpili ng kursong tinahak.

Samantalang ang resulta ng pag-aaral kung ipapangkat ayon sa istatus pang-ekonomiko ay parehong may mataas na lebel ng pagkatuto sa anumang antas ng pamumuhay na kanilang kinabibilangan. Maaaring, sa kabila ng umiiral na makabagong plataporma o paraan sa pagkatuto, ang flexible learning at sa gitna pa rin ng hindi matapos-tapos na pandaigdigdigang krisis sa kalusugan ay tuloy pa rin ang pagkatuto ng karamihan sa mga mag-aaral.Kasabay ng pananalasa ng Covid-19 ay ang pagkawala rin ng maraming kabuhayan, nakompromiso ang pag-aaral ng ilan sa mga mag-aaral ngunit tila marami pa rin ang patuloy na lumaban, nagpunyagi at ituloy ang kanilang nauna ng nasimulan sa kanilang pag-aaral. Mahirap,oo, ngunit hindi lahat ay may kaparehong pananaw. Maraming mga magulang ang mas piniling itawid ang pag-aaral ng kanilang mga anak sa kabila ng kasalatan sa pera at paghihikahos sa buhay sa gitna ng umiiral na pandemya. Dahil na rin sa ipinamalas na determinasyon, tatag ng loob at pagpupursigi ng kanilang mga anak sa kanilang pag-aaral hindi naging balakid ang kasalukuyang estado ng pamumuhay na dinadanas nila sa kasagsagan pa rin ng Covid-19. Sa kalinga,paggabay at bukas-loob na pagsuporta na rin ng kanilang mga guro nagawa nilang ituloy ang kanilang pag-aaral. Patunay lamang na nakakasabay sila sa kanilang mga kaklase na may lalong mataas na pribiliheyo sa kanila at hindi naging hadlang ito sa pagkakaroon ng mataas na grado, babae man o lalaki.

Sa kabilang dako,kung ipapangkat ayon sa lokasyong heograpikal, ang mga tagatugon ay parehong may mataas na lebel ng pagkatuto mapa- barangay man o sa poblacion ang kanilang tirahan. Maaaring, nagagawan ng paraan ng mga mag-aaral sa kung papaano sila makakasabay, makatanggap at makapasa nang kani-kanilang mga modyul at makapasok sa online class sa kabila ng mga pagsubok sa bawat lokasyon. Sa katunayan, ang signal ay mahirap higalapin lalong-lalo na kung nakatira sa barangay lamang, hindi tulad sa poblacion na pirmihan. Mas malala kung ang barangay ay nasa liblib o nasa bukid dahil nagiging hamon ito para sa mga mag-aaral. Sa lagay ng mga mag-aaral, parehong mataas ang lebel ng kanilang pagkatuto sa kabila ng pagkakaiba sa kanilang lokasyong tinitirhan. Siguro'y sinisigurado nilang hindi maaapektuhan ang kanilang pagkatuto sa gitna ng "new normal" saan man sila naroroon.

Rekomendasyon

Batay sa kinalabasan at konklusyon ng pag-aaral, ang mga sumusunod ay iminumungkahi ng mga mananaliksik:

Sa mga mag-aaral, ay ipagpatuloy lamang ang mataas na resulta ng lebel ng pagkatuto sa paraang flexible learning. Pero, kung makakaya pa na maaabot ang lebel na pinakamataas ay mas mainam, ito ay makakamit sa pamamagitan ng determinasyon, at pagmamahal sa napiling kurso , na kahit ang pandemya ay hindi makakahadlang.

Sa mga guro, upang mapanatili at maitaas pa ang lebel ng pagkatuto ng mga mag-aaral ay ipagpatuloy pa nila ang kanilang paraan ng pagtuturo at kung maaari pa ay paunlarin pa ang kaalaman, istratehiya, dulog, at pamamaraan sa pagtuturo ngayong panahon ng pandemya.

Sa mga magulang, ay marapat na huwag silang magsawa na suportahan ang kanilang mga anak moral man o pinansyal sa kanilang pag-aaral sa paraang flexible learning,antabayan, at gabayan pa lalo para sa ikauunlad pa ng lebel ng pagkatuto sa panahon ng pandemya.

Sa tagagawa ng kurikulum, dapat isaalang-alang ang kasalukuyang sitwasyon ng mga mag-aaral sa partikular na mga paaralan upang mabigyan ng gabay ang mga guro sa mga istilo ng pagtuturo na kanilang ilalapat sa kani-kanilang pagtuturo. Dagdag pa, iminumungkahi ang pagpapatuloy pa rin ng flexible learning bilang isang paraan ng pagtuturo at pagkatuto.

Sa mga mananaliksik sa hinaharap, ipagpatuloy ang pananaliksik tungkol sa paggamit ng Flexible learning bilang paraan ng pagkatuto ng mga mag-aaral sa panahon ng pandemya, dahil hindi lingid sa ating kaalaman na ito ay isa sa mahalagang dapat malaman kung pag-uusapan sistema ng edukasyon sa kasalukuyan na kung saan tayo ay sa modernong panahon.

Pasasalamat

Lahat ng gawain ay hindi magtatagumpay kung wala ang mga taong naging bahagi nito. Taos-pusong ipinaaabot ng mga mananaliksik ang pasasalamat sa mga sumusunod na indibidwal at sa iba pang mga naging bahagi ng pag-aaral para sa walang humpay na suporta, tulong , kontribusyon upang maisagawa at maging matagumpay ang pag-aaral na ito.

Kay Dr. Sandra T. Examen, administrador ng kampus, sa pagbibigay ng pagkakataon sa mga mananaliksik na maisagawa ang pag-aaral na ito;

Kay Gng. Genalyn L. Moscaya, kapita-pitagang tagapayo sa pananaliksik na naglaan ng malawak na pang-unawa at gumabay sa ginawang pananaliksik, nagbahagi ng mga ideya upang mas mapalawak ang pamanahong papel. Pinasasalamatan din ang kanyang suporta , makabuluhang oras na ginugol upang iwasto, ayusin ang papel-pampananaliksik, at pagtuturo ng tamang gagawin upang hindi na uulit sa paggawa;

Sa mga magulang, na tumulong at umintindi sa mga panahong abala ang mga mananaliksik sa paggawa ng pag-aaral na ito , sa pagbibigay ng moral at pinansyal na suporta, pagmamahal at inspirasyon;

Sa mga tagatugon, na naglaan ng kanilang oras at masigasig na nakilahok sa pagsagot nang tapat sa inihandang tseklist gamit ang Google Form, kahit na minsan ay mahirap silang maka-acess, at ito ay ginawan nila ng paraan;

Sa mga kamag-aaral, sa pagtutulungan, pagbibigay inspirasyon at pagsuporta upang maisakatuparan ang pamanahong papel na ito;

Higit sa lahat, sa Poong Maykapal, sa paggabay sa mga mananaliksik upang maisagawa at maisakatuparan ang pag-aaral gayundin ang pagpapala ng kaalaman na ginamit sa pananaliksik. Sa pagdinig sa mga panalangin lalong-lalo na sa mga panahong pinanghihinaan ng loob na matapos ito sa takdang panahon, sa proteksyon at seguridad sa pagsasagawa ng pag-aaral na ito lalong-lalo na sa ngayong panahon ng pandemya;

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Metaphorical Descriptions of Teaching and Learning of English during Pandemic

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Abstract - The present study aimed to examine what multilingual English learners and teachers were like in times of the Covid-19 Pandemic based on the English language teachers. Specifically, it attempts to show what metaphors multilingual English language teachers identify to describe their learners and themselves at this time of the Covid-19 pandemic; and what do these metaphors disclose about the English language teachers' sense of teaching while handling their learners. A prompt, "English learners are like" and "teachers are like …" that formed as written narratives of the respondents, was utilized to collect the data. The data were qualitatively analyzed using the in vivo coding, using the respondents' words. These words were listed and categorized using the themes. Findings indicate that multilingual English teachers identify varieties of metaphors to describe their learners. These metaphors describe struggles in their English learning process, especially during the Covid-19 pandemic, and multilingual English teachers should serve as a provision to ease these struggles experienced by the learners. Furthermore, metaphors disclose that multilingual English teachers are shifting from seeing their learners' needs to survive that and become successful in their English language learning to seeing themselves the need to act as helping hands for their learners. Implications for teacher education indicate that greater emphasis still needs to be exerted on exploring language learning and teaching for multilingual learners.

Keywords - English learners and teachers, metaphor, teacher education, multilingual, Masbateño

Introduction

Closed schools and higher education institutions. Imposed lockdowns. Stay at home rules. Alternative teaching methods. Dramatic change.

These scenarios describe the present situation in most, if not all, parts of the world during this Covid-19 Pandemic. With the impacts of this pandemic, the English language teaching and learning process took its share in this universal shift from face-to-face to flexible/blended learning. Expectedly, the transition has created difficulties for the learners (Zboun & Farrah, 2021; Maican & Cocoradă, 2021; UNESCO, 2020).

With the unexpected emergence of a pandemic comes the challenges that heightened the innate complexities of English language teaching and learning for multilingual (Egbert, 2020; Gacs, Goertler, & Spasova, 2020). Countries from all parts of the world continuously focus on provisions such as policies regarding education and training (e.g., White Paper on Education and Training, Commission of the European Communities, 1995; European Union, 2019) and upholding of quality standards and sustainability for language learning in support of online and digital tools (European Union, 2019).

In the Philippines, the government extends efforts on improving the quality of education through the DepEd and CHED's initiatives (e.g., revising learning standards; alternative learning delivery modalities) during this pandemic. However, it is still necessary to examine first-hand how teachers and learners cope with these changes in the education system and how they handle their learners and portray their language learning and teaching processes.

With the gap in the literature concerning English language teaching and learning in the Philippines (Tarrayo et al., 2021) in the middle of this global effect of the pandemic, considering an analysis of the multilingual English language teachers and students' representation through metaphors can bring meaningful information on sustaining valuable English language learning and teaching undertakings for multilingual.

To achieve this goal is to employ metaphorical perceptions about multilinguals' English language teaching and learning process during this pandemic. Espousing this framework on metaphors originated with Lakoff and Johnson's (1980) publication on "Metaphors We Live By," underlying a principle "the locus of metaphor is not in language at all, but in the way we conceptualize one mental domain in terms of another" (p. 185). This means that with this theory, the multilingual English language teachers will portray the kind of English teachers and the learners they hone to become proficient in the English language.

A vast number of metaphor studies in English language or foreign language has been conducted setting learners' perceptions of learning English (Woon, 2016); learners' perspectives on English instructors (Erarslan & Asmali, 2017; Nikitina & Furuoka, 2008; Ahkemoğlu & Kesen Mutlu, (2016); ESL teachers and attitudes (Aktekin, 2013); Views on the learning process (Fang, 20150; Mudra & Aini); learning motivation and experiences (Jin et al., 2014); multilingual's floral Englishes (Carmen, in press); and teachers' views towards research assistant (Yalcin et al., 2016). However, these above-cited studies delved on metaphorical perceptions participated by learners towards teachers or learners' views towards learning and teachers towards teachers and learners in a global context. No study yet has been conducted by a multilingual master of arts in education in English (MAED English) students in the Philippines focusing on themselves and their multilingual learners currently at the pinnacle of Covid-19 Pandemic using metaphoric perceptions. This present study will fill this literature gap. This research attempts to answer the following research questions; What metaphors do multilingual English language teachers identify to describe their learners and themselves at this time of the Covid-19 pandemic? Moreover, what do these metaphors disclose about the English language teachers' sense of teaching while handling their learners?

Literature Review

The Nature of Metaphor

Metaphor is defined "as a novel or poetic linguistic expression where one or more words for a concept are used outside of its normal conventional meaning to express a similar concept" (Lakoff, 1993, p. 202). Metaphors can do many things. It allows us to understand clearly the world surrounding us while seeing a well-known idea or a thing in a different aspect. It shows what is in people's minds and describes tacit knowledge such as experiences, beliefs, attitudes. It is also "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" (Lakoff & Johnson, 1980, p. 5).

George Lakoff's and Mark Johnson's "Metaphors We Live By" (1980) posits that metaphor is beyond creative and imaginative language but says something about our thinking and actions. Lakoff and Johnson used several examples: "I am feeling up today, Your spirits soar or sink; you wake up; you fall asleep" (Lakoff & Johnson, 1980, p. 14- 15); Love is a journey (Lakoff & Johnson, 1980, p. 44). These metaphors imply meanings such as feeling good today, we cannot always be in permanent situations, or love needs time and action to make it work for the lovers.

An additional essential aspect of metaphor is "by investigating people's use of metaphors, we can better understand their emotions, attitudes, and conceptualizations, as individuals and as participants in social life" (Cameron & Maslen, 2010 in Mudra and Aini, 2020, p.72). Therefore, metaphor is an appropriate method to describe the concepts of multilingual English learners and teachers as perceived by multilingual Masbateño English teachers, especially amid the Covid-19 pandemic times.

Metaphor in English Language Teaching and Learning

Ahkemoglu and Kesen Mutlu (2016) investigated the conceptual metaphors of ELT major and non-ELT primary learners as for their perception of an English teacher. The study used metaphor elicitation sheets, semi-structured interviews, and personal essays to gather data. The results indicated metaphors considered peculiar to English language teachers such as oracle, schizophrenic, and gum, and some common metaphors such as "light," "guide," and "bridge."

Nikitina and Furuoka (2008) focused on student-generated metaphors about language teachers and examined its dimensions through quantitative analysis. Distributed metaphor-related questionnaire to

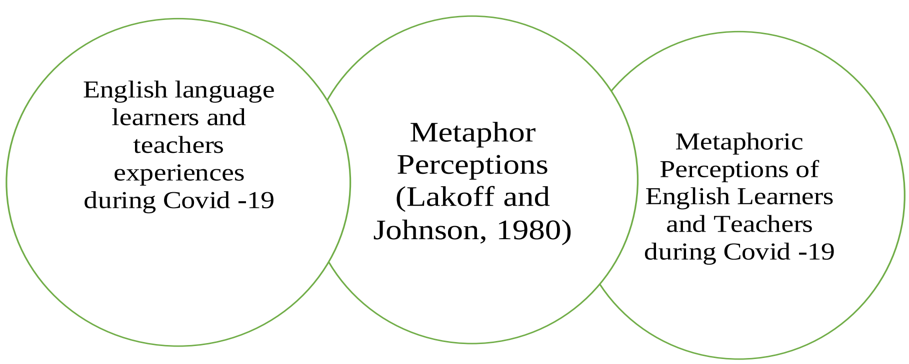
98 students at the Universiti Malaysia Sabah, the study conducted a factor analysis as a research technique in identifying the metaphor dimensions. The findings relate to the metaphor taxonomy of Oxford et al. (1998) and Chen (2003).

Aktekin (2013) revealed ESL teachers' and students' attitudes and beliefs through metaphors. The study analyzed the metaphors produced by the participants, composed of 30 instructors and 156 students from the Foreign Languages School of a Turkish university. Utilizing the metaphor elicitation method wherein learners completed the prompt question 'Learning/Teaching English is like ... because…' using a metaphor, findings depicting teachers' beliefs for language teaching and their roles in the classroom, and learners' beliefs towards language learning process were attained. The study proved the usefulness of metaphor elicitation as valuable in describing the second language learning and teaching process.

Mudra and Aini (2020) examined the attitudes and types of metaphorical perceptions of male and female prospective English teachers (PETs) towards their English learning process. The study employed an elicitation sheet with the prompt "English learning is (like) … because …" to gather the data. The data were qualitatively analyzed by listing, naming, categorizing, and determining the metaphors. The findings revealed metaphors of male and female PET's attitudes towards the English learning process to be positive, negative, ambivalent, and neutral. However, distinctions between male and female PETs were discovered as males viewed English learning negatively while females viewed English learning positively. Moreover, metaphors elicited were categorized into different types such as enjoyable activity, construction work, movement/journey, experience, planting/farming, exploration, and things. In conclusion, the study proved metaphors to help determine suitable strategies, methods, and materials for English teaching and learning.

Erarslani and Asmali (2017) focused on understanding university preparatory class students' mental images about their English language instructors through metaphors. One hundred forty-eight students participated in the study and wrote metaphors on the metaphor elicitation task with the prompt "my English instructor is like.......................because................................" The data gathered were subjected to a metaphor analysis technique that included naming, elimination, deciding unit of analysis, categorization, and quantitative data analysis. The result revealed nine conceptual themes out of 153 metaphors elicited. The top category to describe was the metaphor 'teacher as nurturer' noted by the female participants and followed by "teacher as someone good-hearted" according to the male participants. In sum, students took notice of the good side of the teachers hence this kind of positive views.

Research Framework



Employing this framework served as massive assistance in comprehending the findings of the study. These English language experiences of teachers and learners during this Covid-19 pandemic were vividly appreciated, as portrayed in the metaphors applied by the participants. Through these metaphors, we were able to understand and experience what the multilingual teachers and learners are feeling and seeing while conducting these English language processes even in times of difficulties with the aid of "another thing" (Lakoff & Johnson, 1980, p. 5) that assisted in describing the concept in focus.

Methodology

To materialize exploring the use of metaphors in the language learning and teaching process, 18 MAED students who are currently teachers of English in the province participated in the study. Of these 18 participants who participated in this study, 66% (n=12) were female, and 33% (n=6) were male. With their experiences and knowledge, these participants are believed to produce deep understanding and extended metaphors helpful in this study.

The data were collected using written narratives that elicit metaphors, with a prompt "English learners during this COVID-19 pandemic are like…English teachers during this COVID-19 pandemic are like…. (like). It follows some discussions or justifications about the metaphors given. Before writing their narratives, several data collection steps were followed. First, the participants were informed about metaphors and how they will use them in their narratives. This was done to clarify things that will deepen their understanding of metaphors in the English learning-teaching processes. Also, they were given examples to serve as their pattern in thinking of their metaphors. Second, they were given enough time to write their narratives and requested to send in their outputs via messenger or email.

The researcher suggested to the participants for their metaphor. However, she gave an example. She also used Thomas and Beauchamp's definition of metaphor: "A metaphor is another way of saying whom you are using an object or a role to represent the way you see yourself as a teacher. For example, you could say that I am a gardener because I help children grow." Since metaphors are highly reflective of personal interpretations of phenomena or anything focused at hand, the researcher is aware that their metaphors may be influenced by the lenses of class, gender, race, ethnicity, and educational and life experiences. Therefore, their kind of metaphor was not questioned, especially since their responses were with explanations.

This present study is a descriptive one utilizing the qualitative method. Since the participants were small in number, the researcher coded the data by hand. She started by identifying the metaphor from each participant. Utilizing the iterative approach, she grouped the metaphors according to themes about language learners and teachers that emerged as possible categories. Moreover, she used "in vivo codes, that is, the exact words of the participants as labels for the categories" (Creswell, 2002, p. 448) during this open coding phase. To achieve reliability in the analysis, the researcher used the participants' own words to reflect the actual intent of the participants. When done with coding, the researcher reread the participants' narratives and re-examined the identified thematic categories. The researcher checked that all the metaphors are placed accordingly in their categories.

Results and Discussions

In the study of Fang (2015) and Mudra and Aini (2020), they focused on employing a similar prompt of metaphor elicitations "English learning is like…" and presented a variety of metaphors to describe the teachers and learners during the time wherein the innate complexities of English language teaching and learning for multilingual are found as factors to create a more significant impact. In this study, the participants used metaphors that mainly describe the difficulty of teaching and learning the English language amid the complexities of the Covid-19 pandemic. In response to our first research question: What metaphors do multilingual English language teachers identify to describe their learners and themselves during the Covid-19 pandemic?, the study identified metaphors for both English learners and teachers.

Metaphors for English Learners

The researcher found that the metaphors collected from the written narratives of the participants describe the English learners at this time of Covid-19 as a person, thing, activity, animal, and plant. Understandably, these metaphors focus on the 'learners' needs for guidance,' 'proper direction,' and 'dreams.' Other metaphors described 'can turn into reality,' 'slow learning,' 'need nurturing,' 'push,' and 'can be defensive at times.' Moreover, 'need a proper connection from teachers,' 'must follow steps to go to the top,' 'delicate,' 'a treasure hunter,' 'determination,' 'can win a battle with focus and determination,' and 'encounters a huge challenge,' and 'frustrating experience.' Examples include:

Like a wanderer with only a lamp on hand
Like lost souls in the vast ocean
Like travelers on strange roads
Like a maze
Like travel to an island
Like a mountain climber
Like a miner
Like of David (of the battle of David and Goliath)
Like a turtle
Like plants
Like a seedling
Like a cactus
Like a ladder
Like a pearl
Like a sharp as a tack
Like a boat swallowed by gigantic waves

Learners' Metaphor

Table 1. Learners' Metaphors

IN VIVO CODING/	DESCRIPTIVE CODING	THEMES
Like a wanderer with only a lamp on hand		
Like lost souls in the vast ocean	Needs guidance and direction	
Like travelers on strange roads		
Like a maze	Need proper direction	needs
Like plants		
Like a seedling	Need nurturing	
Like a mountain climber	need push	
Like travel to an island	Dreams can turn into reality	
Like a miner	A treasure hunter	Goal/Success
Like of David (of the battle of David and Goliath)	Can win a battle when with focus and determination	
Like a turtle	Slow	
Like a sharp as a tack	Determination	Trait
Like a cactus	Can be defensive at times, need a right connection from teachers	
Like a pearl	Delicate	
Like a ladder	Must follow steps to go to the top	Process
Like a boat swallowed by gigantic waves	A learner encounters enormous challenges and frustrating experience	Challenges/Natural course of life

Metaphors for English Teachers

The second focus of the participants' metaphor is all about describing teachers while handling their students in these Covid-19 times. These descriptions reveal a thing, an animal, a person, a plant, a part of the body, nature, and a goal. Interpreting these tell us about accommodating, with high tolerance, serve as guidance and defense of and for the students, open for more knowledge, support of the delicate (students), with a helping heart, equipped, giver of hope, nurturing, strong, hopeful/ambition, knows how to anticipate, and alert. Examples of metaphors from their narratives include:

Like fitting yourself into an array of books
Like Camel's endurance under the heat of the sun and long-distance travel
Like the person to water and nurture them
Like a farmer constantly watering the plants
Like a guardian angel
Like a mountain climber with a helping hand
Like a cactus
Like a book
Like a pearl oyster
Like a hand
Like Mining tools
Like sunshine
Like a gardener
Like a Nito Vine
Like reaching a star from above
Like a compass that gives direction
Like a detective

In response to the second question: 2) What do these metaphors disclose about the English language teachers' sense of teaching while handling their learners?

The researcher found several patterns among the metaphors used by the participants. For the metaphors from the first focus of the written narrative, five different themes were determined. They are "needs," "goal or success," "traits," "process," and "challenges as a natural course of life." The responses indicate that these participants saw the needs of the students in their language learning process. These students have their own goals in life as learners, and to achieve these goals, students may ask for help or assistance from their teachers. Students have unique qualities or traits that will help them reach their highest potential as learners. Although they may possess positive (e.g., determination, defensive) and negative (e.g., slow, delicate) traits, they may be honed into the most acceptable learners in the class.

Table 2. Teachers' Metaphors

IN VIVO CODING/	DESCRIPTIVE CODING	THEMES
Like fitting yourself into an array of books	Accommodating	
Like Camel's endurance under the heat of the sun and long-distance travel		Traits
Like the person to water and nurture them	High tolerance	
Like a farmer constantly watering the plants		
Like a gardener	Nurturing	
Like a book	Open for more knowledge	
Like a hand	Helping	
Like an eagle	Alert	
Like a Nito Vine	Strong	
Like reaching a star from above	Hopeful/ ambition	
Like a guardian angel		
Like a compass that gives direction	Guidance	
Like a cactus	Defense	
Like a pearl oyster		Roles
Like a mountain climber with a helping hand	Support of the delicate	
Like sunshine	Giver of hope	
Mining tools	Equipped	Abilities
Like a detective	Anticipate	

Students are also likened to 'process that must be followed from step one to the last part. It means they have to experience things following the step-by-step process without shortcuts or in sequence to become fully developed individuals. Finally, students may be in the middle of challenges or circumstances that could hinder their success in school or with their learning in general. This implies that the lives of the learners are not always smooth-flowing. They are not free from worries and trials. Selected excerpts below demonstrate these experiences of the learners.

S1: In my students very well. Since I have been in their shoes before, I think I can say that the metaphor suited for my learners is like a wanderer with only a lamp at hand. That lamp is none other than us. These learners are like lost travelers in the field of language. They may not know where and when to start, and once they start, they may not know how to continue. Learning the English language is indeed tricky. You will get lost and stumble on the ground, but most importantly, you get on your feet and continue learning, just like us, learners, sometimes feel disappointed once they do not understand the topic. That is why in this metaphor, we are the light to guide them. We are not placed in the classroom to ridicule their subject-verb agreement nor to criticize their accent. We are there to lessen the burden and illuminate the light of a welcoming atmosphere where everyone is free to make mistakes and learn from them. A traveler does not arrive at his destination just by simply smiling throughout the journey. There will be obstacles to go through, just like how our learners mold themselves into the language users that we envisioned them to be. Generally speaking, the thought that I am trying to imply is that our learners are like lost souls in the vast ocean of language, and we will always be there ahead of them, trying to test the waters and making sure that it is safe for them to enjoy. This may sound idealistic, but our job is to turn this into reality which I believe we are putting our best foot forward into its realization.

S2: Being an English language teacher is like fitting into an array of books. During this short but meaningful journey of mine, being a language teacher, I would say that I embody the metaphor of being a book, fitting into an array of books. It will not be enough to depend on the knowledge you acquired from your four years' stay in college as a language teacher. Believe me; it takes more than that. In teaching English, you depend not only on what is learned based on grammar, syntax, and pragmatics. You go beyond what the usual teaching of language demands. For me, it is like using an interdisciplinary approach to teach the language you do effectively. Not limit yourself to what grammar seeks to teach. Based on experience, to effectively produce a relative output in writing, you have to trigger the students' emotions. With that being said, you are not just a teacher. You already have to cover the job of a psychiatrist. I believe that writing in English is best achieved when emotions flow freely. I also believe that for us to teach effectively and efficiently, we must widen our horizons. We must break limitations. We must endure the hardship of reading tons of related materials to come up with the best teaching material. This book signifies what we are as a teacher and what there is to be offered around us. Practically speaking, you cannot get the best output in crafting your syllabus once you limit your resources. Just like in teaching, if you only depend on yourself being a teacher, you will not get any further than a good discussion or outcome. In a nutshell, what I mean by this metaphor is to realize the hardship that we all English language teachers have to go through. We may not be the best in what we do, but we continuously improve our craft but do not set limitations in what we can do.

S3: My pupils in language lesson respond slowly, but at the end of the session, they can reach the finish line and my only way to hold on even waiting, sometimes make me feel inactive, is my continuous and never-ending patience because I believe in achieving goals, the most important step is starting and keep moving. And I thank you! No matter how slow it is, it is still better than nothing.

S4: My patience and sacrifice as a language teacher are like the camel's endurance under the heat of the sun and long-distance travel. I know that teaching the language will always be my life as long as I am in the field. Like Camel, along the way, there is scarcity like in the desert, but at my back, I have stirred something I can feed to myself to feed my learners. As a professional, I am gathering ideas and continuous learning to always pour the emptiness in the learners' cap through my survival and consistently imparting knowledge and skills.

S5: I would compare my students to plants. Each one of them is beautiful and unique in its way. I understand that they have different approaches in terms of learning basically because of their *different interests, experiences, and needs. Thus, I firmly believe that each one requires extra care to grow and be successful based on their differences. As a teacher, I must water them and nurture them to watch them grow fully.*

S6: Climbing mountain as a metaphor. If you ever climb a mountain, you know that it is hard work. You are often taking it one step at a time. However, when you reach the top, you get a great sense of ecstasy. You can look down at the views and enjoy the fact that you conquered a significant challenge. My role as an English teacher is to uplift the English proficiency of my students, give them the extra mile to become proficient and productive individuals. I would not be selfish to impart my knowledge, give the best of my ability, and help them grow to the fullest.

S7: Learners are travelers to strange roads. Students get to learn many things in school, might as well the fact that there were many things they need to learn along the process they seem to be traveling either in an unknown or strange road where there is no probability of going to the exact destination. This is the same way learners learn English; it is hard and takes real-time to acquire and become language literate. By this, they significantly need guidance and patience, companion on their travel towards achieving greatness, perhaps, believing in the power of language is learned. Learners can probably learn the English language properly when they are in a conducive learning environment with a teacher who can give the best way of teaching, communicate using their thoughts, establish a harmonious relationship and strive harder to make sense and difference through learning a language.

S8: Every student is a potency whereby he/she is being subjected to becoming an actor. It is inevitable for a student to have difficulties in various subjects, matter, and learning areas because of insufficient knowledge resources. Analogically, a student is an epitome of a plant sown on rocky ground lacking the soil's nutrients, especially during the dry season. A plant can grow, flourish, and bear much fruit to a learner. A plant on the rocky ground needs a stable water resource for it to survive, to accomplish its purpose on its nature, so he/she can be produced globally, but his/her foundation is unfortunately not concrete during his/her early stage of learning. In this connection, his/her communication skills, especially the so-called lingua franca, should be appropriately learned and contribute essential knowledge to cope with globalization.

S9: Learners learn best in a ladder-like way. Learning starts from the basics. These basic skills are considered indispensable in the process of learning. A child would experience difficulty in acquiring complex knowledge if his foundational skills are not adequately established. The ladder that is shown in the picture above represents the steps of learning. The people around are perhaps the educators and persons who can guide and teach the learners systematically through step-by-step processes for them to be directed on the path they are taking. Every stair has a complementary skill that is needed for a learner to acquire. If the acquisition of this skill were fully implemented, learners would be productive in many ways; just like learning English, it can be learned in a step-by-step process so that little by little, learners can use this language in interaction and communication. They will be comfortable in using this language in their daily conversation.

S10: Children as pearls, teachers, and the education as the pearl oysters as with all metaphors in appreciation of it depends on some understanding of at least one of the elements of being compared. Most people have some rudimentary idea about how plants develop and can easily use the analogy of children to plants. The development of pearl is less understood and used to understand the relationship between the child and education. We need some understanding of the relationship between the pearl and the pearl oyster. The pearl is the result of some irritant. Like a grain of sand getting inside the shell of an oyster, the oyster then secretes calcium to encapsulate the irritant so that it lessens the irritation. The shell protects the meaty part of the oyster and the pearl and allows the transformation process to occur. Creating a pearl is very gradual, with the oyster covering the object with more substance each day to make it a pearl, transforming the worthless piece of clay and sand little by little into a beautiful and valuable pearl. Education and guidance can also transform a piece of clay or sand into a being, into a beautiful creation. Without the shell of guidance and education, we remain as a worthless piece of clay. As teachers, we need *to transform the irritants in our shells into beautiful beings by daily bathing them with the education they need.*

Moreover, with this kind of constant action, all the efforts of then oysters will eventually pay off in the future. We will transform every worthless sand into a gem that will be adorned every side of the earth. Moreover, by that, we make this world shine through the reflection of those pearls that will light our path in attaining a better world to live in. to all oysters out there, we must not stop enduring all the pains that the irritants are causing us. Let us transform every sand into a pearl even if it means exhaustion, for someday, we will sell those pearls and become rich.

S11: The plant, on the other hand, represents our students. They must be given much attention and proper nourishment to grow in the way we want them to be. The water, the fertilizer, and proper sanitation somehow serve as the knowledge, skills, and values we want to instill in them. So, in the end, we can harvest the excellent fruit they might give us and be the best version of plants they can be.

S12: They say knowledge is power, but to me, knowledge is a treasure. Buried down deep in this earthly world, like a mine hole for students to dig. For them to discover and explore such intriguing existence. As students, they symbolize as the miner to find their answers in a dark tunnel. However, we teachers are a tool. We light, we give them something to use to find and fig knowledge as tools for education. We must be sharp and study as a pickaxe. Not dull as a rusty iron.

Teachers have also embraced their roles, centering themselves on their students than focusing on their curriculum or their manner of teaching (Thomas and Beauchamp, 2011). For the second focus of the narratives, on the part of the teachers, they see themselves the necessity to acquire abilities that will feed the needs of the learners. There are many ways to support the learners. Participants regard themselves "as a guardian angel," (guidance); "like a compass which gives direction," (guidance); "like a cactus," (defense); "like a pearl oyster," (support of the delicate); and "like a mountain climber with a helping hand," (support/pull up the learners).

The following are some metaphoric elicitations describing a teacher as perceived by the MAED in English students.

S1: An educator is a guardian angel. Teachers are genuinely becoming guardian angels for every learner they have in their custody. They take up the responsibility of safeguarding and nurturing the students when learners are on their job. We, teachers, are considered their second parent, which signifies huge responsibility to let students feel the referent power, which actively demonstrates the feeling of being loved, welcomed, and belonging to a conducive learning environment for them. Similar to a guardian angel, teachers must find different ways to teach our learners in the English language differently since they are diverse in many aspects. For instance, learners want their teachers to be more approachable, make learning fun, encourage verbal practice, be understandable and forgiving, make connections between the lessons and students' actual lives, and lastly, guide them to become the best version of themselves.

S2: Cactus as a teacher. A Cactus is like a teacher who can be a complex species. There are life lessons that we all can learn from this plant. Lessons that will serve as a reminder whenever we drift from our personal ……….

S3: In the context of the metaphorical statement on students in the English language subjectively, the mentor should have the right and factual knowledge to teach and guide the learner as the philosopher said: "nemocud nun habet" which means you cannot give what you do not have. Thus, a mentor equipped with a concrete foundation should provide a concrete foundation to a learner. I am confident of the knowledge and foundation acquired from others and knowledge that is learned intrinsically. Also, I have faith and know that every learner is unique and capable of becoming a good and productive individual, further in the analogy of a student and plant. The teacher would also be the farmer analogically. The farmer will toil and water the plants to grow, flourish and bear *fruits since it is his nature, so a teacher will provide the essential* learning resources to the learners from him/ her to be able to cope with every task given to him/her. Both the teacher and the student will feel the contentment of the fruits of their labor.

S4: Teacher represents as a book. Teaching language subject is not an easy task. It requires skill and passion for learning different approaches that will fit learners' learning differences. Books symbolize wisdom. I chose the book as the representation of a teacher because the teacher is the one who gives insights and guides learners on what to do. Though a role of a teacher today is only a facilitator, he/she plays a vital role in the teaching-learning process. As a neophyte English teacher, I have experienced difficulty teaching English language subjects, knowing that I have different kinds of learners. To fulfill their needs, I ought to utilize appropriate teaching strategies that will cater to their diversity. In promoting effective teaching, teachers should be acquainted with the various approaches that / can produce globally competitive quality learners, just like the picture. Helping learners learn their ways and letting them collaborate are some life-long that are necessary to build a productive nation.

S5: Nurturing a plant as a metaphor for teaching English. The outcome and product of a particular thing depend on the process it underwent. It depends on how strong the foundation is made of. The picture above simply shows a concrete situation of teaching the English language to the learners. Teaching English to students is as you invest in a plant you are nurturing. Planting then is not just simply putting the seed into the soil. Indeed, there is no assurance whether the plant will successfully grow so as English Language Teaching. Teaching English is indeed always be compared to nurturing a plant.

S6: The hands represent the teacher. The hand is much responsible for taking care of the plant. All the needed things must be done and provided so the plant will prosper and grow. Thy hand must water and cultivate the soil for complete nourishment and proper growth. The teacher might nurture a different breed of plants. Even if so, it is always what is best in his/her mind, so the plant will successfully grow until it bears good fruit. Same as teaching English to diverse learners. Learners who have different learning styles, multiple intelligences, personalities, and needs the teacher must address.

Conclusion and Recommendations

Showing their support for the students through metaphors, these participants are already giving clues to their learners about the kind of teachers they have become while living their teaching careers. Overall, the responses in this section display positive support for the learners, indicating their passion for supporting the learners achieve their own educational goals in life and becoming productive individuals when they are out in the real world. In summary, teachers' metaphors emphasize on traits, roles, and abilities of the teachers.

The connection between how English language teachers see themselves and their learners is a viable feature towards understanding the relationship between teachers and learners in the English language classroom. Employing metaphors in this study offered an explicit exploration of how multilingual teachers might help the multilingual learners by giving them a clue on focusing on the needs of the learners rather than themselves. With the metaphors utilized in the study, we were given a concrete idea that English language teaching and learning is not easy and needed understanding teachers with a heart for their struggling learners. The study's findings will serve as a hint for other multilingual English language teachers of what to expect in teaching learners, especially in these trying times of the Covid-19 pandemic. Furthermore, this study signifies the richness of metaphors when used to describe the experiences of English language teachers and learners in a multilingual context amid this challenging time. The researcher has realized that even in the middle of hardship, teaching could be a source of comfort when there is a passion for achieving teachers' goals for learners' sake.

Acknowledgment

The researcher acknowledges the respondents in giving their precious time to materialize and finish this study. Moreover, her gratitude goes to her supportive state college, DEBESMSCAT, for all the necessary assistance extended to her. To God be the glory. Thank you all.

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Development and Acceptability of Minasbate-Translated Grade 3 Science Module

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Abstract - This study aimed to develop a Grade 3 Science module by translation using the Minasbate Working Orthography and to determine its level of acceptability among all the Mandaon North District Grade 3 Science teachers. This descriptive and developmental study used the Grade 3 Science textbook in Hiligaynon, Filipino and English, the translated Minasbate version of the selected Unit 1, and the translation evaluation criteria questionnaire based on the work of Reiss (2014). The five highest criteria rated by the respondents were fluency in the target language, suited to the target audience, appropriate for the purpose intended, sufficient familiarity with the field/ subject matter, and overall positive quality or consistency. The Module was rated lowest in these criteria: shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage, considers place factors, components of the original text have been adequately carried over to the target language on the lexical level, considers extra-linguistic factors, and takes into account the influence exercised by non-linguistic factors. Overall, the Module was rated as Acceptable. The variance in the acceptability was 0.034196 meaning the scores on the different criteria were closer together. The findings reflect the different criteria used in evaluating a localized instructional material in terms of the translated materials' acceptability to the teachers who will potentially use them and the instructional material's acceptability by the respondents, although the completed work may still be enhanced even further by working on the different criteria which were rated low.

Keywords - Mother Tongue-Based Multilingual Education, Minasbate, translation, Science

Introduction

More than ten years ago, one of the most prominent advocates of Mother Tongue-Based Multilingual Education (MTB-MLE) noted a fundamental flaw afflicting Philippine education: that a lot of learners lack comprehension of what their teacher is saying because they have to overcome the language barrier (Filipino and English being the prescribed media of instruction) in school, which leads to their losing track of the lesson and thus learning (Nolasco, 2008). When the MTB-MLE was made an official policy through the Department of Education's Deped Order No. 60, series of 2008, institutionalized through DepEd Order No. 74, series of 2009 and later strengthened by way of a law (Republic Act 10533 or the Enhanced Basic Education Curriculum Act of 2013) (Congress of the Philippines, 2013), the road towards the official use of the Minasbate language in grade schools in Masbate was paved. However, the absence of a generally-accepted orthography in the language and the dearth of available usable educational materials led to the continued use of Filipino in supposedly Mother Tongue subjects and worse, the use of Bicolano and later Hiligaynon instructional materials in some schools in the province. Thus, the research-based and legal prescription for the use of Mother Tongue remained unheeded.

The unwise use of Bicolano may have stemmed from a misinterpretation of Section 4, paragraph 6 of RA 10533, which states in part that: "For kindergarten and the first three years (3) of elementary education, instruction, teaching materials and assessment shall be in the regional or native language (emphasis supplied) of the learners." Though Masbate is part of Bicol region, Bicolano is spoken by only 2% of the population (Rosero, 2009). Meanwhile, Hiligaynon materials were supplied recently to elementary schools in Mandaon and Balud probably because Mandaonians and Baludeños speak a Minasbate dialect with a lot of Hiligaynon similarities. Mandaon and neighboring Balud are the two municipalities of Masbate with this peculiarity probably because of their trading ties and proximity to Hiligaynon-speaking Panay Island. Thus, the move from Bicolano to Hiligaynon may be an improvement though still inadequate, with teachers not using or minimally using the DepEd-supplied materials. Moreover, both Bicolano and Hiligaynon materials were prepared by non-Masbatenyos and thus can be said to lack appropriateness and cultural grounding and context suitable to Masbate's early grade learners.

In a bid to address the problem, several faculty members of the Dr. Emilio B. Espinosa, Sr. Memorial State College of Agriculture and Technology (DEBESMSCAT) initiated a research project entitled "Minasbate Orthography and Development of Mother Tongue-Based Instructional Materials". One of the objectives of the project was the crafting of the Minasbate Working Orthography, which was realized in 2016. In June 2018, further development materialized in the form of a Division of Masbate-wide training on the said Minasbate Working Orthography. The above-mentioned research project sponsored by DEBESMSCAT referred to the development of materials in subjects taught in the college level. Thus, there is a lack of initiative in the more important domain of instructional materials development in Minasbate in the kindergarten up to Grade 3 (K-3) levels, which is the one required by both science and law. Therefore, the present research is a step in the right direction and a very much needed one. Further delay contributes to the unnecessary detriment of the K-3 learners. However, with the inherent limitations of time, technical expertise and resources, completely original instructional materials may not be immediately feasible for production. Hence, translation of available instructional materials may be done both to test the Minasbate Working Orthography and to address the present needs of the Grade 3 elementary pupils.

Many potential benefits can be derived from this study. It can be helpful to the Department of Education (DepEd) in that the results may be used in the development of instructional materials in Minasbate language and in the recognition of the language in which mother tongue materials can be developed and used in the classroom. Particularly, negative concerns identified can be considered in the various stages of instructional materials development. School administrators may also benefit in the sense that instructional outcomes may be enhanced by the use of translated mother tongue materials. Administrators also function as instructional managers so they will have an advantage in attaining learning goals. The teachers will benefit most of the time when available information on instructional materials development is considered in coming up with outputs designed to help facilitate learning in the classroom. They will also be familiar with some of the issues that come up in the development process and other implications of this study on their roles as not just teachers but also as instructional content developers. Most importantly, learners will be the main beneficiaries in any improvement in the instructional process. As the center of the teaching-learning process, learners should always benefit when appropriate materials are used for facilitating learning.

The objectives of this study are the following: (1) development of the Grade 3 Science textbook by translation using the Working Orthography; and (2) determining the level of acceptability among Mandaon North District Grade 3 Science teachers of the Minasbate-translated Grade 3 Science Module translated using the Working Orthography. This study was conducted in Mandaon North District, Mandaon, Masbate from June 2018 to February 2019. It was limited in its scope of translating the lessons for the first grading period or approximately the Unit I only in the science textbook.

Methodology

This study made use of the Grade 3 Science textbook in Hiligaynon, Filipino and English, the translated Minasbate version of the selected Unit 1, and the translation evaluation criteria questionnaire based on the work of Reiss (2014) as the basis for the acceptability of the translation. It is quantitative research employing the descriptive design to determine the acceptability of the Grade 3 Minasbate language Science Module translated by the researcher. The developmental design is also used in that a translated instructional material was developed and evaluated for its acceptability. The researcher used all the Grade 3 Science teachers in the North District of Mandaon as the respondents, thus complete enumeration sampling technique was used. Before the conduct of the study, the necessary permission from the pertinent school, district and division authorities was sought. The translation evaluation criteria questionnaire that was used to test the Module's translation's acceptability was developed. Afterwards, translation of the topics in the textbook followed. The Minasbate-translated Grade 3 Science Module and the Hiligaynon version together with the questionnaire was provided to the teacher-evaluators. Data analysis of the acceptability scores followed. To determine the level of acceptability of the Minasbate-translated Module, descriptive measures such as mean and variance were used to analyze the gathered data.

Results and Discussions

The developed Science 3 Module was translated using the Minasbate Working Orthography and underwent initial checking by a Minasbate language scholar who is also an Education Program Specialist of the Department of Education Masbate Province Division. The Hiligaynon version of the Science 3 Learners' Material was primarily used, as well as the original English version as additional reference. The researchers themselves translated the work with the help of fellow teachers who are residents of Mandaon and more familiar with Minasbate western dialect.

A total of 19 Science 3 teachers evaluated the developed Minasbate western dialect-translated Science 3 Module using a 26-item translation evaluation criteria. Table 1 shows the five highest criteria rated by the respondents. Criteria 1 "the translation shows fluency in the target language (Minasbate western dialect)" ranked first with 1.57 while criteria 4 "the translation shows an overall positive quality, or shows a consistency with the overall spirit of the original work" ranked number five with 1.68, all equivalent to Highly Acceptable. In short, the five criteria rated highest were fluency in the target language, suited to the target audience, appropriate for the purpose intended, sufficient familiarity with the field/ subject matter, and overall positive quality or consistency.

Table 1. Translation Evaluation Criteria Rated Highest by the Respondents

Translation Evaluation Criteria	Level of Acceptability	
	Numerical Value	Adjectival Equivalent
The translation shows fluency in the target language (Minasbate western dialect).	1.57	Highly Acceptable
The translation is particularly suited to the target audience of Grade 3 Science pupils whose mother tongue is Minasbate western dialect.	1.58	Highly Acceptable
The translation is particularly appropriate for the purpose intended which is to facilitate learning of Grade 3 Science lessons.	1.58	Highly Acceptable
The translator shows sufficient familiarity with the field/ subject matter of the material, enabling him/ her to construct a lexically adequate version in the target language.	1.63	Highly Acceptable
The translation shows an overall positive quality, or shows a consistency with the overall spirit of the original work.	1.68	Highly Acceptable

Table 2 shows the five lowest rated criteria as determined by the respondents evaluating the developed Science 3 Module. Criteria 2 "the translation shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage" was the lowest rated while criteria 13 "the translation takes into account the influence exercised by non-linguistic factors on the semantic, lexical, grammatical and stylistic fields" was the fifth lowest rated. In summary, the Module was rated lowest in these criteria: shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage, considers place factors, components of the original text have been adequately carried over to the target language on the lexical level, considers extra-linguistic factors, and takes into account the influence exercised by non-linguistic factors.

Table 2. Translation Evaluation Criteria Rated Lowest by the Respondents

Translation Evaluation Criteria	Level of Acceptability	
	Numerical Value	Adjectival Equivalent
The translation takes into account the influence exercised by non-linguistic factors on the semantic, lexical, grammatical and stylistic fields.	2.05	Acceptable

The translation considers extra-linguistic factors enabling the author to make specific choices among the variety of means available in his/ her mother language which would not only be intelligible to the reader or hearer, but under certain circumstances would even permit him/ her to ignore certain linguistic means and still be understood by members of his/ her language group.	2.1	Acceptable
The translation shows that the components of the original text have been adequately carried over to the target language on the lexical level. This involves observing whether the translator has demonstrated competence in dealing with technical terminology and special idioms, "false friends" (word in a second language that closely resembles a word in somebody's first language but means something different), homonyms, untranslatable words, names and metaphors, plays on words, idiomatic usages and proverbs, etc.	2.16	Acceptable
The translation considers place factors which include primarily all the facts and characteristics of the country and culture of the source language, and further also any associations of the scene where the actions described take place.	2.16	Acceptable
The translation shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage.	2.26	Acceptable

The 26 criteria and their obtained level of acceptability, numerical and adjectival, are shown in Table 3. As a whole, the Module had an overall acceptability of 1.9 equivalent to Acceptable. The variance in the acceptability was 0.034196 meaning the scores on the different criteria were closer together.

Table 3. Translation Evaluation Criteria Rated as by the Respondents

Translation Evaluation Criteria	Level of Acceptability	
	Numerical Value	**Adjectival Equivalent**
1. The translation shows fluency in the target language (Minasbate western dialect).	1.57	Highly Acceptable
2. The translation shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage.	2.26	Acceptable
3. The translation avoids internal consistencies or absurdities which may be conspicuous even without a comparison with the original text, such as inadequate knowledge of the vocabulary and grammar of the source language, a failure to appreciate non-verbal factors operative in the target language, other errors of this kind that generally occur on the semantic level of translation.	1.94	Acceptable
4. The translation shows an overall positive quality, or shows a consistency with the overall spirit of the original work.	1.68	Highly Acceptable
5. The translation shows complete fidelity to the intent of the original author.	1.84	Acceptable
6. The translation is particularly suited to the target audience of Grade 3 Science pupils whose mother tongue is Minasbate western dialect.	1.58	Highly Acceptable
7. The translation is particularly appropriate for the purpose intended which is to facilitate learning of Grade 3 Science lessons.	1.58	Highly Acceptable
8. The translation is appropriate for the text type and kind which is content-focused/ informative educational work.	1.74	Highly Acceptable
9. The translation ensures that the content and information in the original is fully represented in the target language. This primary requirement demands that the linguistic form of the translation be adapted without reservation to the idiom of the target language; in other words, the form of the translation should be essentially oriented to the usage of the *target language*.	1.95	Acceptable
10. The translation shows thoroughness of its orientation to the target language. The target language must dominate, because in this type of text the informational content is most important, and the reader of the translation needs to have it presented in a familiar linguistic form.	1.95	Acceptable
11. The translated content-focused/ informative educational work shows primary concern for accuracy of data.	1.95	Acceptable
12. The translation shows recognition of the potential linguistic equivalents, and then selecting from among them the one best adapted to the particular	1.95	Acceptable

	context, also considering how well each element in the translation unit fits the overall context.		
13.	The translation takes into account the influence exercised by non-linguistic factors on the semantic, lexical, grammatical and stylistic fields.	2.05	Acceptable
14.	The translation is able to recognize polysemous (with multiple meanings) words and homonyms and uses them appropriately.	2.0	Acceptable
15.	The translation shows congruence between source and target language terms, and avoids misinterpretations and arbitrary additions or omissions.	2.0	Acceptable
16.	The translation shows that the components of the original text have been adequately carried over to the target language on the lexical level. This involves observing whether the translator has demonstrated competence in dealing with technical terminology and special idioms, “false friends” (word in a second language that closely resembles a word in somebody's first language but means something different), homonyms, untranslatable words, names and metaphors, plays on words, idiomatic usages and proverbs, etc.	2.16	Acceptable
17.	The translation shows that grammatical correctness is satisfied by conforming to usage of the target language and if the relevant semantic and stylistic aspects of the grammatical structure of the source language have been understood and adequately rendered.	1.95	Acceptable
18.	The translation shows that stylistically, the text in the target language exhibits complete correspondence, whether the translation gives due consideration to the differences between colloquial and standard or formal usage observed in the original, and whether the differences between the language levels in the two languages are actually comparable.	1.95	Acceptable
19.	The translation takes into account the stylistic components of the source text with regard to standard, individual, and contemporary usage, and whether in particular stylistic aspects the author’s creative expressions deviate from normal language usage.	2.0	Acceptable
20.	The translation pays attention to how each of the elements (linguistic, semantic, lexical, grammatical, and stylistic) relate not only to each other, but also to the demands of their text type. In content-focused texts verbal semantics (the lexical element) and syntactical semantics (the grammatical element) assume priority.	2.0	Acceptable
21.	The translation considers extra-linguistic factors enabling the author to make specific choices among the variety of means available in his/ her mother language which would not only be intelligible to the reader or hearer, but under certain circumstances would even permit him/ her to ignore certain linguistic means and still be understood by members of his/ her language group.	2.10	Acceptable
22.	The translator has chosen the proper words not only lexically but semantically as well appropriate “in the situation” or context.	1.79	Highly Acceptable
23.	The translator shows sufficient familiarity with the field/ subject matter of the material, enabling him/ her to construct a lexically adequate version in the target language.	1.63	Highly Acceptable
24.	The translation considers place factors which include primarily all the facts and characteristics of the country and culture of the source language, and further also any associations of the scene where the actions described take place.	2.16	Acceptable
25.	The translator makes it possible for the reader in the target language to see and understand the text in the terms of his own cultural context.	1.73	Highly Acceptable
26.	The translation shows that affective implications (‘affective values,’ ‘means of expression,’ ‘affective elements of thought,’ an ‘affective character of means of expression,’ an ‘affective syntax,’ and the like”) are appropriately echoed in the target language, whether the linguistic means for expressing humor or irony, scorn or sarcasm, excitement or emphasis in the original have been properly recognized by the translator and rendered appropriately in the target language.	1.90	Acceptable
	Average	1.9	Acceptable

The five criteria rated highest were fluency in the target language, suited to the target audience, appropriate for the purpose intended, sufficient familiarity with the field/ subject matter, and overall positive quality or consistency. This section discusses each of these criteria to relate the present study results to existing literature. Speaking about English translation, Venuti (2004, p. 4) stated that a fluent translation is current ("modern") instead of archaic, that is widely used instead of specialized ("jargonisation"), and that is standard instead of colloquial ("slangy"). Venuti added that a fluent translation is immediately recognizable and intelligible, "familiarised," domesticated, not "disconcerting[ly]" foreign, capable of giving the reader unobstructed "access to great thoughts," to what is "present in the original." Under the regime of fluent translating, the translator works to make his or her work "invisible," producing the illusory effect of transparency that simultaneously masks its status as an illusion: the translated text seems "natural," i.e., not translated. It is interesting to note that the present study is rated the highest in fluency of translation, probably due to the fluency of the translators themselves in Minasbate western dialect. Reiss (2014) stated although translation methods should not be determined solely by the particular target audience, the extent to which adjustments should be made, depends very largely upon the audience for which the translation is designed (Nida, 1964). In translating for Grade 3 learners, this criterion is very important because the translation is aimed at an educational purpose. The appropriateness for the purpose which is for teaching should also be a top consideration. It is the high acceptability in these criteria that the study results should be primarily considered.

As for the criteria sufficient familiarity with the field/ subject matter, and overall positive quality or consistency, these results could be due to the adherence of the translators to the format of the material used for translation and the fact that the researcher-translator herself has taught the subject for several years. Even though the researcher-translator has limited training in professional translation, she relied more on extra-textual knowledge, in this case with subject matter knowledge, which supports the findings of Tirkonnen-Conditt (1992) and Bernardini (2001). The results of the present study speak to the viability of classroom teachers as translators of instructional materials for learners. Science teachers who taught the subject themselves were employed as the translators in a study which found significant effects for the native language of the students (Prophet & Dow, 2009). In a study by Then and Ting (2011) involving code-switching by teachers in a science classroom, it was found out that "the reiterative function of code-switching resembling translation was used mainly for bridging comprehension gaps", as well as for "marking salient information and instructions". Thus, it is reasonable to infer that the science teachers themselves are a resource for translation work in their field.

The Module was rated lowest in these criteria: shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage, considers place factors, components of the original text have been adequately carried over to the target language on the lexical level, considers extra-linguistic factors, and takes into account the influence exercised by non-linguistic factors. These translation criteria obtained the lowest ratings from the respondents which all got the interpretation of Acceptable. With the possible exception of the criteria "considers place factors", the lowest rated criteria are all related to work that are best suited to be done by someone with linguistics training or by a professional translator. However, while the Module was evaluated lowest in these criteria, the overall results are still Acceptable.

Talking about the criteria "shows a mastery of stylistic and grammatical standards and is supported by familiarity with idiomatic usage", the low ratings may be due to the lack a widely-publicized stylistic and grammatical standards and idiomatic usage guides on Minasbate western dialect. Minasbate is not taught as a prescribed subject in any level except only recently in the elementary level. In addition, according to Wolfenden (2001), there are competing grammatical and lexical subsystems in the Minasbate language, which may shed light on how another criteria "components of the original text have been adequately carried over to the target language on the lexical level" obtained a low rating.

The extra-linguistic situation plays a critical role in determining the form in the target language (Catford, 1965). According to Mounin (1967), "Translation is primarily and universally a linguistic operation," but yet "it is never solely and exclusively a linguistic operation." Hence, extra-linguistic and non-linguistic factors also need to be accounted for. In trying to improve on the translation of the present Module, these factors need to be further investigated.

As to the place factors, which include primarily all the facts and characteristics of the country and culture of the source language, and further also any associations of the scene where the actions described take place, the source language Hiligaynon and also English, may or may not be factored since the text itself is about science, which should not be affected mainly by the place of origin of the source languages Ilo-ilo and United Kingdom/ United States. If at all, the influence is from English since many scientific terms in the material are English in origin. According to Reiss (2014), it is especially difficult to translate into a target language lacking similar kinds of places, attempting to describe things which are beyond the range of its speakers' imagination. According to Cary (1963), the act of communication is never perfect. Much is lost in the process, and this is as true for the printed page of translation as for the foreign country that is being described or the distant past which is being revived. It is impossible for the end result to be perfectly identical without a difference.

Conclusion and Recommendations

The findings of this study reflect the different criteria used in evaluating a localized instructional material translated using the Minasbate Working Orthography in terms of the translated materials' acceptability to the teachers who will potentially use them. The instructional material Science 3 Module has been rated as acceptable by the respondents of this study, although the completed work may still be improved to enhance its acceptability even further. Different criteria which were rated low by the respondents were identified in this study and may serve as springboard for improving the Module's acceptability. As noted by Fillmore (2014, p. 46), the implementation of MTB-MLE makes the stakeholders realize the actual work needed and the enormous time and effort needed, that things done are constantly a work in progress, and the importance of taking beginning steps.

The findings of this study may also be seen in the light of the language policy currently in place. The Philippine MTB-MLE policy is anchored on the theory of common underlying proficiency (CUP) by Cummins (1981a, p. 25) which states that experience with either the first language or the second language can "promote the development of the proficiency underlying both languages, given adequate motivation and exposure to both, either in school or in the wider environment". CUP is related to the interdependence principle (Cummins, 1981b), which states that when instruction in the first language is effective in promoting proficiency in that first language, transfer of this proficiency to a second language will occur provided there is adequate exposure and adequate motivation to learn that second language. Closely-related is the cognitive/ academic language proficiency (CALP) theory by Cummins (1981a, p. 23) which defines CALP as "those dimensions of language proficiency that are strongly related to literacy skills. CALP reflects individual differences in processing language which is 'disembedded' from a meaningful interpersonal context and is an autonomous representation of meaning". While student achievement was not investigated in this present study, findings concerning the role of teachers in making the mother tongue work as a tool for comprehension revealed their viability in this regard. Spolsky (2009, p. 1) posited that "the goal of a theory of language policy is to account for the choices made by individual speakers on the basis of rule-governed patterns recognized by the speech community (or communities) of which they are members". Thus, stakeholders like the teachers implementing the language policy need to be factored in the conversation. Ideally, if the theories hold, proficiency in mother tongue leads to proficiency in second language and vice versa, which can facilitate proficiency in content areas such as science, which in turn should guide the adoption of language policy such as MTB-MLE.

Based on the findings of this study, the following recommendations are suggested: the developed Science 3 Module be utilized in the classroom and further studied for its effectiveness in facilitating learning; the developed Module for further improved according to the criteria which were rated low; and the difficulties encountered in the translation using the Minasbate Working Orthography be qualitatively studied.

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Diversification in the Digital Age: Measures of Information and Communications Technology (ICT) Literacy and Self-Efficacy of Junior High School Students

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Abstract - The rapid advancement of science and technology in society allows the learners to be more informed about the changes and developments that happen in society and education. Moreover, literacy evolves from the conventional way of reading and writing to applying and accessing information from a digital environment. Hence, this paper aims to look into a way to extrapolate the correlation of Information and Communications Technology (ICT) literacy and self-efficacy of Junior High School students in one private school in the district of Obando, Bulacan, Philippines. Using a descriptive-correlation research design, the researcher believes that there is a significant correlation between and among variables. The chosen respondents for the study consisted of one hundred and thirty-five (135). The findings of the study revealed that Junior High School students had moderate literacy towards ICT. Also, it was found out that the Junior High School students described their ICT self-efficacy as moderately agrees. Furthermore, results of the correlational analysis using Pearson r revealed that the ICT literacy of Junior High School students was significantly correlated to their ICT self-efficacy. It is recommended that the schools should include this concept to their annual school improvement plan under the students' services affairs and pay attention to this since majority of the private schools were now at the height of integrating ICT in the school system and further uplift the ICT literacy and self-efficacy of Junior High School students toward ICT integration thru an enhancement program.

Keywords - Information and Communications Technology (ICT), Literacy, Self-Efficacy, Junior High School Students

Introduction

The presence of technology in society is undoubtedly expanding as science and technology progress. The rapid advancement of technology allows individuals to become more informed about what is truly going on in their society and to become more conscious of the potential consequences for their life. As a result, people's literacy was improved from the capacity to read and write to accessing and applying information from a digital environment. This paves the path for the emergence of digital literacy. People's minds aid society's advancement in any subject, allowing it better to answer their demands through the use of technology. The capacity of humans to access, process, comprehend, and create information or material in a digital context is referred to as digital literacy. Digital literacy refers to a set of abilities needed to succeed in an increasingly digital environment. In addition, people who are more scientifically and technologically literate make better decisions and choices in their life (Ng, 2013). It also aids an individual's advancement in any field by allowing them better to meet their demands via the use of technology.

On the verge of the Industrial Revolution 4.0, where technology infusion is one of the significant reformation and innovation, it appears that education is one of the areas that have been impacted by ICT infusion. Researchers worldwide have concluded that 21st-century education has reacted to the needs of Education 4.0 through management system advancements, and it now has a significant impact on the teaching and learning process. Educators are increasingly expected to use digital technologies as instructional aids while instructing pupils. Thus, it is critical to educate the brains of our country's future leaders, who are the learners in school, on how to be more digitally literate. With this, numerous educational institutions employ ICT; Jan (2018) stipulated that since they believe it provides many benefits to students and empowers teachers and learners to boost learning and obtain 21st-century skills. It is widely assumed that ICT provides students with a more collaborative and engaging teaching and learning environment.

Tang & Chaw (2016) extrapolated that ICT literacy is essential for students to learn effectively in a blended learning environment. When the level of students' ICT literacy is high, it can make it easier for them to participate in the learning process, giving learners a more positive feeling about the educational experience. Hence, students' learning performance and self-efficacy may be increased.

Unfortunately, recent studies have indicated that not all learners are digitally literate, although most learners are actively engaged with modern digital resources and have confidence in utilizing them. According to Fazli & Norazilah (2016), there is a lack of digital literacy in online learning. Anthonysamy (2020) discovered that students lacked literacy in a digital learning environment. It may be explained by the significant challenges students face in gaining digital literacy, including power outages, inadequate internet bandwidth, ICT facilities, and a lack of digital literacy programs and standards (Ukwoma, Iwundu, & Iwundu, 2016). Similarly, Lorenzo (2016) articulated that most public schools in the Philippines lack adequate ICT infrastructure, and most teachers are not ICT literate, resulting in low student and school performance. The study of Hamutoglu et al. (2020) revealed that the students from Turkey scored lower than other countries in terms of cognitive skills needed for digital literacy. This may lead to the recommendation of program development for digital literacy for students. Even if they have advanced in ICT and are actively engaged in it, they still face problems and are concerned about its utilization and application.

Presently, a multitude of Information and Communication Technologies affected the Philippines. Information and Communications Technology (ICT) in the Philippines represents a watershed moment in the educational system, and it provides a wide range of opportunities for both teachers and students. Individuals may gain multiple benefits from ICT, including information transfer, data collection, and research, but it is still a pipe dream for many. People plan, develop, implement, and exchange ideas and information has evolved as computers and laptops, the internet, social media, and smartphone devices have become more prominent. And to adapt to these developments, Filipinos will need to learn a whole new set of ICT-related skills to be successful citizens in an increasingly digital world.

In times of crisis, such as when the country was hit hard by the Corona Virus 2019 (COVID-19), ICT usage became a viable alternative for keeping the school year going. As a result, most institutions adopt an online distance learning mode to continue educating Filipino students in the thick of the pandemic. ICT literacy and ICT self-efficacy are essential to understand and measure since their learning modality is online distance education. Their literacy and self-efficacy should be examined for the school to determine if they experienced issues and concerns about it and how the school uplifts the ICT literacy and self-efficacy of the learners in a digital learning environment. Hence, the primary concern of this study is to describe and evaluate the Information and Communications Technology (ICT) literacy of Junior High School students and its association to their ICT self-efficacy from one private school in one district of Bulacan, Philippines, for the School Year 2020-2021. This study would try to propose an enhancement program through a webinar series, as the study's outcome, for the learners for the school administration to enhance the ICT literacy and self-efficacy in an online distance learning modality.

Methodology

This study essentially used a descriptive correlation design that determined the relationship of Junior High School students' ICT literacy and their ICT self-efficacy. The correlational analysis is designed to evaluate whether or not there is a relationship or correlation between and among variables and the extent and degree of the relationship. The study respondents included 135 private schools' Junior High School students who are currently enrolled for the School Year 2020 - 2021 and currently using an online distance learning modality as their platform for learning. The researcher utilized a universal sampling procedure as the study's sampling technique since the entire population was active in an online learning platform. This study utilized a survey instrument, a standardized questionnaire, through Google Forms as the primary data collection tool. The Digital Literacy Survey Questionnaire (DLSQ), from the study of Baterna, Mina, & Rogayan (2020) and the ICT Self-Efficacy Scale of Musharraf et al. (2018), is highly reliable, as evidenced by 0.904 and 0.88. Hence, it is highly reliable since Cronbach's alpha values are above .70. In addition, the study's variables were analyzed and interpreted using a quantitative research approach. The researcher utilized Statistical Packages for Social Sciences (SPSS) v. 25 as the study's statistical tools to analyze and interpret the data gathered. Junior High School students' ICT literacy, as the study's independent variable, and ICT self-efficacy, as the study's dependent variables, were quantified using descriptive statistics such as weighted mean procedures.

On the other hand, to determine if there's a significant correlation between the students' ICT literacy and their ICT self-efficacy, the researchers utilized Pearson Product Moment Correlation (Pearson r). Informed consent and respondents' assent were secured first before their participation in this study.To establish and safeguard ethics in conducting this study, the researcher firmly observed the following actions: the students' names were not mentioned in any part of the study; the students as the respondents of the study were not emotionally or physically harmed. The study respondents were not forced to participate, thus they have the right to refuse their participation in the study. The researcher cited and observed proper referencing of literature to promote and copyright laws. All respondents in the study signed informed consent before their participation. Observance of all ethical principles was done during the conduct of the study. All researchers declared no conflict of interest in conducting this study.

Results and Discussions

ICT-based innovations have genuinely become a part of the paradigm change in education, particularly at the onset of this global pandemic. A paucity of literature expressed that most learners in the 21st-century are literate on the use of ICT in their studies and have an excellent self-efficacy in ICT. Hence, this section would catechize and discuss the ICT literacy and self-efficacy of Junior High School students and corroborate the findings with other researchers worldwide to develop a well-written enhancement program for the learners.

Table 1. Information and Communications Technology (ICT) Literacy of Junior High School Students

Information and Communications Technology (ICT) Literacy of Junior High School Students	Average	Interpretation	Rank
1. Access and Evaluation of Information	3.61	High	1st
2. Interaction through Technologies	3.44	Moderate	2nd
3. Effective Application of Technology	3.38	Moderate	3rd
4. Media Analysis	3.26	Moderate	4th
5. Creation of Media Products	3.25	Moderate	5th
6. Utilization and Management of Information	3.06	Moderate	6th
General Average	**3.33**	**Moderate**	

Table 1 presents the Information and Communications Technology (ICT) literacy of Junior High School students. It shows that Junior High School students exhibit moderate literacy towards ICT, as shown by the mean values of 3.33. Analysis from the six domains of ICT literacy shows that access and evaluation of the information are high, as can be gleaned from the mean values of 3.61. While, Junior High School students display moderate interaction through technologies, practical application of technology, media analysis, creation of media products, and utilization and management of information, as can be gleaned from the mean values of 3.44, 3.38, 3.26, 3.25, and 3.06 respectively.

It can be deduced from the summary of digital literacy in Table 1 that access and evaluation of information in the digital environment recorded the highest weighted mean of 3.61, interpreted as high. The finding expresses that Junior High School students can access information in a digital environment effectively and efficiently. They know where the information needed can be generated and can use for their studies. Similarly, findings reveal that students are literate in evaluating critically and scientifically the generated information from a digital environment. These components are the essential skills Junior High School students should possess since some fake information and grey bodies of knowledge are continuously arising. Their awareness of different websites may also help them to determine whether the information is credible and reliable to be used. Marttunen, Salminen, & Utriainen (2021) emphasized that promoting students' skills in evaluating and analyzing the credibility and reliability of online information and analyzing its quality is vital in helping students determine what is helpful not. This contradicts what the Stanford History Education Group (2016) found out about students' poor skills and literacy in accessing and evaluating information delivered through different websites and social media.

Specific developments and improvements about digital literacy were observed on the students. That is why the poor skills in accessing and evaluating information were not a problem for the teachers, especially when students are more exposed to the use of technologies in their studies. Thus, it is now the responsibility of the school to enrich and uplift this domain of digital literacy for the students to be more critical and scientific in using and generating information from any websites or online sources. The role of the school in this matter is essential since the top mission is to give quality learning and promote the capacity of young men to future leaders (Kahne & Bowyer, 2017).

Table 2. Information and Communications Technology (ICT) Self-Efficacy of Junior High School Students

Information and Communications Technology (ICT) Self-Efficacy of Junior High School Students	Average	Interpretation	Rank
1. Privacy and Security	3.61	Agree	1st
2. Communication	3.48	Moderately Agree	2nd
3. Differentiation and Learning	3.25	Moderately Agree	3rd
General Average	**3.45**	**Moderately Agree**	

Table 2 illuminates the Junior High School students' Information and Communications Technology (ICT) self-efficacy. As can be observed from the table above, it is shown that Junior High School students describe their ICT self-efficacy as moderately agree as shown by the general mean values of 3.45. As to the sub-constructs of ICT self-efficacy, students rated agree the privacy and security by the weighted mean value of 3.61, while communication and differentiation and learning recorded mean values of 3.48 and 3.25 respectively, interpreted as moderately agree.

The summary on the table above shows that privacy and security appear to have the highest mean values among the three sub-constructs of 3.61, interpreted as agree. This implies that students are aware of the privacy and security of using ICT resources and social networking sites. It is evident by the practices that they know how to change passwords from their social networking sites accounts and their email. Also, they are known to filter, hide, and restrict any post or person from their social networking sites and report on any fake accounts and news that may affect their account's privacy and security. The findings may aid the conclusion of Saravanakumar & Deepa (2016) which privacy concerns in social networking sites are relatively weak, and users' efforts to make suitable modifications to their social media privacy are far lower than in other modes of security operations. Furthermore, many social media users lack technological skills and efficacy, resulting in minimal privacy concerns regarding their own content. Since the students' exposure to ICT is very high, problems and issues about privacy and security were added. These developments contributed to the web developers' maintaining privacy and security.

On the other hand, differentiation and learning recorded the lowest weighted mean values of 3.65, interpreted as moderately agree, among the three sub-constructs of ICT self-efficacy. This reflects that students have a moderate knowledge and understanding of different information provided on social networking sites and other information sources, if correct or not. They can't easily judge the reliability and trustworthiness of information on social networking sites and other sites on the internet. Moreover, the findings also observed that students are not aware of the consequences of too much use of social networking sites and the likes. Some violations are committed that affect the conduct on the use of ICT in learning. Despite the importance of media literacy in preparing students for later learning in adulthood and to a technology-based education, it is also a vital moment owing to the complexity of the material they receive and the malleability of their brains. The children and adolescents' abilities to assess the credibility of information were evaluated. The findings revealed that most of them have placed minors in front of information that is alien to their interests or hardly related to the issues that affect them (Middaugh, 2019).

Overall, the findings on students' ICT self-efficacy postulated are in moderation. Though they are considered digital natives because of their orientation towards technology, they still have room for improvement and expansion of knowledge on the technical side of ICT in education, focused on their self-efficacy. They still need to learn how they will become more secure on the use of ICT, their attitudes and demeanor towards it, and improve their social skills. It can be further inferred that the school should look into this matter since the new normal setting of education in this School Year was commenced thru an online distance learning modality.

Table 3. Test of Significant Correlation between Information and Communications Technology (ICT) Literacy of Junior High School Students and their ICT Self-Efficacy

Computed r-value	t-value	Critical t-value	Decision	Interpretation
0.51	6.84	1.96	Reject the Null Hypothesis	Significant

$\alpha = 0.05$

The study's significant variables are information and Communications Technology (ICT) literacy of Junior High School students and their ICT self-efficacy. With this, this table seeks to ascertain whether the ICT literacy of Junior High School students correlated significantly to their ICT self-efficacy. The data collected were subjected to the Pearson Product Moment Correlation to determine the link between and among variables.

As can be gleaned from the results of Pearson's r analysis in Table 3, it shows that the ICT literacy of Junior High School students is correlated significantly to their ICT self-efficacy to a varying extent. The nature of correlation is positive as shown by the r-value of 0.51; this means that the better ICT literacy they develop, the better self-efficacy may be perceived. Conversely, the lesser ICT literacy, it is expected that their ICT self-efficacy will also be lessened. The magnitude or degree of correlation is a substantial/moderate relationship based from the r-value of 0.51. This implies a substantial/moderate relationship between the ICT literacy and self-efficacy of Junior High School students.

Furthermore, findings from the analysis of the t-test for the significance of r show a computed t-values equals 6.84 at 0.05 level of significance where degrees of freedom (d.f.) is equal to 150; the critical t-values was registered at 1.96. Comparison of the computed and critical t-values reveals that the computed t-value exceeds or is greater than the critical t-value, giving the researcher reasons to reject the null hypothesis. This may be safely concluded that ICT literacy significantly affects their ICT self-efficacy.

This implies that the level of their ICT literacy exerts a significant relationship to their self-efficacy. This implies that students show competence and self-confidence as digital literate studies in this new normal education set-up. The correlation of ICT literacy and self-efficacy may result to in academic excellence in this new normal education set-up. As stipulated by Kay (2006), cited in the study of Wang & Chen (2021), the stronger the student's self-esteem, the better. The more effective ICT literacy is, the more probable this favorable attitude is to encourage individuals to participate in ICT-related activities, and therefore the greater the ICT literacy.

Conclusion and Recommendations

Based on the objectives raised in this study and the findings presented, this study concluded that junior high school students possess moderate ICT literacy. This study also found out that junior high school students agreed to their ICT self-efficacy in this new normal education set-up. This further concludes that even though they are so-called digital natives, they still have room for improvements to uplift their ICT literacy and self-efficacy in this new normal education setup. Furthermore, the findings revealed that the ICT literacy of junior high school students is correlated to their ICT self-efficacy.

The study recommends that the principal, academic coordinator, and teachers pay careful attention to students' ICT literacy and self-efficacy, particularly those with inadequate information and digital literacy abilities, and take appropriate action. As a result, principals and top management in educational institutions must be cautious about allocating appropriate resources to boost and develop students' self-efficacy, particularly those with low self-efficacy. Also, an enhancement program to further unleash their potential towards ICT and its role to their studies this new normal education set-up. This is to strengthen the knowledge and understanding of students about the essential domains in ICT literacy and self-efficacy in a digital learning environment. Enhancement programs may maintain and improve the literacy and self-efficacy of students towards ICT integration. This enhancement program can be included in the homeroom time of the class advisers or a separate program to be commenced in the school to assure that the welfare of the students is the topmost priority of the school in this new normal education set-up. Moreover, this study proposed that teachers create exploratory classes that increase students' willingness to learn outside of the classroom with ICT integration. Future researchers, who may be interested in the same parameter of the study, may undertake a similar study to assess further the ICT literacy and self-efficacy of junior high school students and towards ICT.

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Exploring the Problem-Solving Ability of Gen Z Gamers and Non-Gamers

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Abstract - One of the results of modernization is the development of video games for enjoyment, creativity, socializing, and challenges. Though video games have been a source of debate in terms of their negative impact, they have been viewed as an instructional tool for improving various abilities such as problem-solving. The researchers conducted a descriptive-comparative study to explore the problem-solving ability of Gen Z gamers and non-gamers. Respondents of the study were drawn from a state-run university's senior and junior high school students, with a total of 210 respondents (105 non-gamers and 105 gamers). The researchers used a two-part instrument to arrive at a conclusion. The researchers formulated the first part to determine the respondents' profile and the second part, is the Solving Problems Survey. All of the information was obtained via internet questionnaires, particularly Google Forms. T-test and ANOVA were used to evaluate the data. The results revealed that there was no significant difference in the problem-solving abilities of Gen Z when grouped based on their gaming status, gender, estimated weekly gaming hours, and preferred video game genre. Hence, the said factors have little or no impact on an individual's problem-solving ability. Future researchers may experiment with different approaches, research designs, instruments, and other methods to learn more about problem-solving and video games, or they may try to investigate different variables such as spatial skills, cognitive skills, social skills, memory, perception, and so on.

Keywords - video games, problem solving ability, gamers, non-gamers, descriptive-comparative

Introduction

Problem solving is an important skill, especially for young people, and it is not something that people are born with; it is something that develops over time. According to Coombs (2013), Generation Z are lacking in problem-solving and have not exhibited the ability to look at a situation, put it in a setting, analyze it and settle on a choice. Consequently, young people frequently make irrational decisions, and they require guidance as their brains develop, especially in managing desires and impulses in solving problems (Talukder, 2013). Moreover, adolescents struggle with life skills because they frequently lack opportunities to practice decision-making and problem-solving processes in their daily lives (RPC, 2013). Evidently, Gen Z, particularly adolescents, lack or have low problem-solving abilities.

To improve problem solving ability, it requires experience and practice, especially in a mathematics classroom for students. Accordingly, experience and practice will help individuals develop problem-solving, and Mathematics will help students improve the analytical and critical thinking skills required to solve problems (Kumar & Raja, 2019). In addition, students who practice specific mathematical problem-solving methods may learn how to solve problems successfully in a broader context later in life (Szabo et al., 2020).

Pehkonen et al. (2013) asserted that instruction must support the learner's problem solving and mathematical thinking in addition to calculation skills that are being taught in school. Furthermore, the role of mathematics in numerous countries is to foster students' understanding of mathematical structures and to develop mathematical thinking (Pehkonen et al., 2013). In the Philippines, the twin goals of mathematics education are critical thinking and problem-solving skills (DepEd, 2016).

Given the fact that there are learner-centered instructional approaches such as project-based and problem-based learning that allow learners to analyze a real-life problem to generate or design and develop a solution (Donnelly & Fitzmaurice, 2016), concerns have been raised that, despite these numerous strategies implemented by teachers, many students are struggling to understand and apply the concept of mathematical problem solving in real life (Malibiran et al., 2019). Findings by Pearce et al. (2013), show that the most cited reason for struggling with problem solving is the students' ability to read and understand the problem. This indicates that there is a need to implement a new strategy or tool to assist with the aforementioned problem.

The number of studies demonstrating how video games help improve problem solving (Adachi & Willoughby, 2013; Shute & Emihovich, 2018; Kumar & Raja, 2019) and the growing number of people actively participating in online gaming (Statista, 2021; Elliott, 2020), provide compelling reasons to investigate the phenomenon. Hence, the researchers explore the problem-solving ability of gen z gamers and non-gamers. Moreover, researchers test if there is a significant difference in the problem-solving ability of the respondents when grouped according to their profile, which includes gaming status, gender, estimated number of hours spent playing video games per week, and most preferred/played genre of video games.

To provide further detail on the study's context, several research and associated literature were analyzed. Various references were quoted and reviewed to help the readers better understand the subject and its underlying variables. One important thing to define in this study is problem solving. In this study, problem solving is defined in broader context, as to its application on day-to-day life. Problem solving abilities are essential for finding answers to issues that arise in a variety of settings, including the home, families, partnerships, schooling, employment, careers, financial capital, travel, and health (Kapur, 2020). Moreover, engaging in problem solving includes the abilities to: (1) identify the problem, (2) assess probable causes of the problem, (3) find possible solutions, (4) choose the best solution, (5) execute the solution, and (6) evaluate and update the solution as needed. Hence, problem solving according to D'Zurilla and Maydeu-Olivares (1995) as cited by Duerden et al., (2012) is a self-directed cognitive behavioral mechanism where an individual tries to find or discover useful or adaptive ways of dealing with difficult circumstances experienced in daily life. It is somewhat similar to the definition of Polya (1945 & 1962) as cited in DepEd (2016), that problem solving entails overcoming a difficulty, overcoming an obstacle, and determining a solution to an unknown problem.

Having a good and low level of problem-solving ability has different implications. Possessing good problem solving will help an individual easily adjust to new things and makes it easier to find solutions to every problem that the person encounters (Hooda & Devi, 2018). In contrast, low problem-solving skills are associated with the character of a young adult and influence impulsiveness or carelessness (Jaffee & D'Zurilla, 2009). Also, low problem-solving ability could be a main predisposing factor for depression among adolescents (Babaoglu et al., 2014). Moreover, as per Gutierrez (2012), having low-level problem-solving ability affects children's academic success.

According to Sumitha and Rexlin (2016), among 100 adolescents, 68 percent have average problem-solving skills while 17 percent have low problem-solving skills and 15 percent have high problem-solving skills. Similar to the findings of Baro and Paraon (2017) that adolescents in Cavite’s level of problem-solving skills is "average", having the highest percentage of 34.3, followed by "low average" with 33.7 percent, and "below average" with 15.7 percent. Thus, in the study of Baro and Paraon, it was clearly shown that there is only a small difference in the number of individuals who have average and low problem-solving ability. Moreover, according to Piaget (1950), as referenced by the American Psychological Association (2002), teenagers at their age are more cognizant of logically analysing the problem's sources and effects. They've also advanced to the point where they can evaluate the effects of their activities and forecast dangers (Office of Adolescent Health, 2018). Risk taking, on the other hand, is one of the most challenging aspects of youth development, and they do not always make the healthiest decisions due to a variety of reasons such as emotions, social rewards, impulsiveness and so on. Furthermore, they are having difficulty choosing which course of action is the best.

There are several ways to improve in problem solving. According to Abazov (2016), to improve problem-solving skills, one must practice identifying the problem, define the main elements of the problem, examine possible solutions, act on resolving the problem, and look for lessons to learn. Moreover, according to Kapur (2020), to build problem solving skills, one must gain experience, look out for ways to solve problems, use practice and role-play strategies, learn how others solve problems, focus on the answer rather than the problem, explicitly identify and grasp the problem, cultivate critical reasoning, develop analytical skills, and produce as many ideas as possible.

Studies have been conducted to show that video games may or may not help in improving problem-solving abilities. As per Adachi and Willoughby (2013), video games are a helpful tool for the development of problem-solving skills. Moreover, based on the findings of Shute and Emihovich (2018), conducting research with the goal of improving twenty-first century competencies such as problem-solving skills for learners through immersive and engaging gameplay environments is relevant and important to undertake. In line with that, according to Kumar and Raja (2019), video and computer-based games have advantages, such as the ability to select various solutions to a challenging problem and then observe the effect of the decision, allowing users to experiment and exercise problem solving in a safe environment. Hence, they concluded that video games can help improve problem-solving abilities, creative process, and even confidence. In contrast, Rosenbaum and Burt (2017) looked at the statistical differences between gamers and non-gamers and concluded that there is no significant difference in response time or puzzle solving problems between gamers and non-gamers. Furthermore, Santos et al. (2019), found no significant differences in problem-solving abilities between gamers and non-gamers in terms of recognizing the problem, identifying feasible solutions, and implementing solutions after assessing the data. Hence, it is possible that abilities learned in video games aren't transferred to real-world situations (Unsworth et al., 2015 and Simons et al, 2016).

In the paper of Esposito (2005), video games are defined as a story-based game that can be a puzzle game, a toy game, or any other type of game that can be controlled by an audio-visual apparatus. According to him, an audio-visual apparatus is an electronic system with computing capabilities, input devices (controllers, mouse, keyboard, etc.), and output devices (screen, loudspeakers, etc.), such as an arcade video game, a video game console, a handheld console, a computer, a personal digital assistant, a phone, and so on. Video games could be played in two ways, either offline or online, where online video games are mainly played with the use of the internet (Labucay, 2014).

Data shows that numerous individuals are hooked on video games. As per Statista (2021), the video gaming industry is huge and shows no signs of slowing down. In the year 2015, there were almost two billion video gamers across the world and it is expected to rise, making it three billion gamers by 2023. And based on the report of Elliott (2020), the Philippines is the world's 25th-biggest market by game revenues, as well as a key driver of Southeast Asia's overall games market. Additionally, mobile phones are the most used platform for playing video games, followed by PC games and then console games. In terms of the gender of the gamers, males engage more than females (Hainey et al. 2011; Brand et al. 2017). According to the most current research, in the Philippines, 81 percent of males and 73 percent of females stated they played online games, showing that males were more active in online gaming than females (Statista Research Department, 2020). Most gamers only play in moderation. Most players spend 1 to 5 hours each week playing video games (Baro & Paraon, 2017). It backs with the result of Dumrique (2018), that gamers spend 3-5 hours playing on weekends. In genre preference, according to Baro and Paraon (2017), the puzzle genre is the most popular among gamers, whereas Chen (2019) claims that role-playing games are the most popular, and CIIT Philippines (2019) claims that action games are one of the most recognizable among gamers. It demonstrates how genre preferences change over time and differs based on the respondents.

Several studies also looked into the implication of the number of hours spent playing video games and problem-solving skills. A study conducted by (Takeuchi et al., 2016) showed that more hours of playing video games for children is linked to lower verbal IQ and other negative changes in the brain which actively affects learning and other brain functions. However, a study by Posso (2016) shows that teenagers who play video games are more likely to get better grades in school where students who play online games almost every day scored 17 points higher than the average in Science and 15 points higher in Mathematics. Posso also suggested that online gaming could aid in the development of problem-solving skills in young people. Supporting neither Takeuchi et al. (2016) nor Posso (2016), a descriptive-comparative study conducted by Baro and Paraon (2017) shows that there is no significant relationship between problem solving skills and the number of hours spent playing video games. Hancock (2010) also found no substantial link between social problem-solving abilities and video game play time.

Another thing to consider is the most played or most preferred genre of video game, since there are studies that suggest that certain genres could provide cognitive benefits. Chen (2019) demonstrates that not all video games aid in the development of problem-solving abilities, some games are just meant to be played for fun and leisure. Furthermore, only video games that feature a range of tasks, the need to work as a team, problem-solving tactics and approaches, and so on may assist players in improving their problem-solving abilities. According to Adachi and Willoughby (2013), the game genre has a significant impact on problem-solving abilities since their research discovered that strategic video game activity among high school students predicted self-reported problem-solving ability. de Freitas & Griffiths (2007) indicated how Massively Multiplayer Online Role-Playing Games (MMORPG) can support collaborative learning. Moreover, the study concluded that gaming supported decision-making, team building, and electronic communication skills. Additionally, it can improve their learning about discipline, and about the complexities of environmental decision making, which is essential in problem-solving skills.

In line with the foregoing discussion, the researchers addressed and answered the following questions:

1. How may Gen Z gamers and non-gamers be described in terms of:
   1.1 Gender
   1.2 Estimated number of hours spent per week playing video games
   1.3 Most played or preferred genre of video games
2. What is the level of the problem-solving ability of the respondents?
3. Is there a significant difference in the problem-solving ability when respondents are grouped according to their profile?

Method

Research Design. A descriptive-comparative research design was used to differentiate the level of problem-solving ability of the gamers and non-gamers. It is an acceptable choice for the descriptive part of this research design when the goal of the study is to identify characteristics, frequencies, trends, and categories (Mc Combes, 2019). According to Akhtar (2016), descriptive research aims to accurately portray the characteristics of a specific group or situation by answering the questions, what, who, where, how, and when. While in the comparison part, it is applied when two groups of people are compared, and analyzes the similarities and differences between them in order to better understand both groups (Drummond & Murphey-Reyes, 2017). Generally, in descriptive-comparative research, the researcher considers at least two non-manipulated variables and establishes a formal procedure for gathering criterion data to compare and conclude which of the two is better (L. Calmorin & M. Calmorin, 2005). The descriptive-comparative design is appropriate in this study because the researchers' goal is to describe the profile of Gen Z gamers and non-gamers as well as their level of problem-solving. Moreover, comparisons were made between Gen Z gamers and non-gamers to determine if there is a significant difference in the problem-solving ability when grouped according to their profile. In line with this, the dependent variable, which is the problem-solving ability, is measured in two or more groups which are the gamers and non-gamers, but the independent variable (gamers and non-gamers including their profile) is not manipulated (Drummond & Murphey-Reyes, 2017).

Respondents. The respondents in the study consist of 105 gamers and 105 non-gamers. The G-Power analysis was used to determine the 210 total samples with an effect size of 0.50 based on a 95% confidence level. The researchers selected from the Junior High School and Senior High School students of a state-run university. To determine who among the students are qualified to be respondents, the researchers conducted a pre-survey to determine who are gamers and non-gamers. The purposive sampling method is necessary for researchers to properly select and approach qualified respondents (Palys, 2008). For non-gamers, the respondents should be: (1) ages 12-18, and (2) is not actively engaging in any form of online video games. Respondents for the gamers must be: (1) ages of 12 and 18, and (2) actively engaging in any form of online video games. The researchers then used convenience sampling after determining the likely respondents. Convenient sampling involves members of the target population who fulfil certain practical requirements, such as availability at a specific time or desire to participate Taherdoost (2016).

Instruments. To collect data from the respondents, the researchers used an instrument that has two parts. The first part of the questionnaire is made by the researchers to identify the profile of the respondents. It includes the gaming status, gender, estimated number of hours spent per week playing video games, and the most played/preferred genre of video games. The estimated number of hours spent per week was adopted from Kowert (2015) as cited by Baro and Paraon (2017). The most played or preferred genre of video games is based on the study of Chen (2019). The second part of the questionnaire was adopted by the researchers, which is the Solving Problems Survey modified by Baro and Paraon (2017). The scale consists of 24 statements with a 5-point Likert Scale: Never=1, Rarely=2, Sometimes=3, Often=4, Always=5. The solving problem survey evaluates the student's problem-solving ability by analyzing the frequency with which the following abilities are used: identify/define the problem (1–4), analyze possible causes or assumptions (5–8), identify possible solutions (9–12), select the best solution (13–16), implement solution (17–20), and evaluate progress and revise as needed. Items 5, 9, 15, 17, 20, and 22 will be reverse scores when getting the results (Never=5 to Always=1). The scores per item will be summed up together. The higher scores indicate greater ability at problem solving.

According to Duerden et al. (2010) as cited by Baro and Paraon (2017), the instrument has been reported that it underwent content and convergent validity and the result of pilot testing with over 200 youth participants showed that the survey has good internal consistency; $\alpha = .76$. To ensure that the instrument is appropriate to answer the research questions, the researchers also conducted face and content validity with the help of three professionals. The three validators asserted that the instrument will address the research questions. The researchers also conducted a pilot test with 30 respondents to establish a test of reliability which produces an internal consistency of .84 Cronbach Alpha.

Ethical Consideration. The researchers ensured that ethical standards and procedures were observed all throughout the research process. Before using the Solving Problem Survey, the researchers asked permission from authors Baro and Paraon by sending a formal letter through email. The researchers also ensured that all the publications that were used, are cited properly. The researchers also sent letters to the concerned officials of the state-run university to seek permission to conduct the study. The respondents were given the option of answering or not answering the survey, and the Data Privacy Act was included in the questionnaire. Furthermore, responders were assured that all information obtained will be treated with utmost confidentiality.

Data Analysis. To describe and present the profile of the respondents as well as the level of problem-solving ability, the researchers summarized the results through frequency distribution and percentage. Mean and standard deviation were also used in presenting the data obtained. The researchers conducted a priority test before utilizing the T-test and ANOVA, which are the Kolmogorov-Smirnov Test of Normality and Levene's Test for equality of Variance. The T-test was utilized to determine whether there are any significant differences between the means of the two groups. Specifically, the t-test was used to understand whether problem solving ability differs between gamers and non-gamers, male and female non-gamers, and male and female gamers. Analysis of Variance (ANOVA) was utilized to determine if there is a significant difference between the means or three or more groups. Particularly, ANOVA was used to examine significant differences in problem solving ability of gamers when grouped according to the estimated number of hours spent per week playing video games and the most played or preferred genre of video games.

Results and Discussions

This part includes the presentation, analysis, and interpretation of data gathered by the researchers. All data were collected through online surveys, specifically Google forms. The survey was distributed to 210 people, 105 of whom were gamers and 105 of whom were non-gamers. The results are presented according to the sequence of the research questions.

The Profile of the Gen Z Gamers and Non-Gamers

	Gender	Frequency	Percentage (%)
Gamers	Male	72	34.3
	Female	33	15.7
Non-Gamers	Male	31	14.8
	Female	74	35.2
	Total	210	100

Table 1 shows the gender of gamers and non-gamers. According to the data, male gamers outnumbered female gamers, with 72 of the 105 respondents (68.6%) being male. Also, according to the table, among the 105 non-gamers, there are 74 (70.5%) females. It shows that among gamers, there are more males and among non-gamers there are more females.

The results are consistent with the findings of Hainey et al. (2011) and Brand et al. (2017), which indicate that males are more interested in video games than females. The result is also congruent with the current data of Statista Research Department (2020), which found that 81 percent of males and 73 percent of females in the Philippines said they played online games, indicating that males were more involved in online gaming. Moreover, there are fewer male non-gamers than female non-gamers.

Table 2. Frequency and percentage distribution of the gamers according to the estimated number of hours spent per week playing video games

Number of Hours	Frequency	Percentage (%)
1 – 5 hours per week	34	32.4
6 – 10 hours per week	19	18.1
11 – 20 hours per week	27	25.7
More than 20 hours per week	25	23.8
Total	**105**	**100**

Table 2 displays the estimated number of hours spent playing video games each week by gamers. According to the collected data, the range "1 – 5 hours per week" has the most frequency with 34 (32.4%) responses, while the range "6 – 10 hours per week" has the lowest frequency with 19 (18.1%) responses. Since “1-5 hours per week” has the highest frequency, it means that most gamers only play in moderation.

The finding is aligned with the result of Baro and Paraon (2017) where the respondents in their study are the gamer adolescents in Cavite City. The study shows that most gamers are spending 1 to 5 hours per week playing video games with the highest percentage of 68.5%. The case is also quite similar to the findings of Dumrique (2018) that gamers spend 3-5 hours during weekends in playing.

Table 3. Frequency and percentage distribution of the gamers according to the most played/preferred genre of video games

Genre of Video Games	Frequency	Percentage (%)
Action Genre	38	36.2
Adventure Genre	24	22.9
Puzzle Genre	9	8.6
Shooting Genre	13	12.4
Simulation Genre	11	10.5
Strategy Genre	10	9.5
Total	**105**	**100**

Table 3 shows the most played or preferred genre of video games of gen z gamers. Based on the table, “action genre” has the highest frequency of 38 (36.2%) and “puzzle genre” has the lowest frequency of 9 (8.6%). The table demonstrates that action games are the most popular video game genre among gamers, implying that they choose games that test their reflexes, hand-eye coordination, and response speed.

The result is not aligned to the findings of Baro and Paraon (2017) and Chen (2019), According to the study of Baro and Paraon (2017) puzzle genre is the most preferred genre of gamers where it has the highest percentage of 20.2%. As per Chen (2019) role playing is the gamers most preferred genre of video gamers which has 49% response. On the contrary, the result is aligned with the report of CIIT Philippines (2019) that the action genre is one of the most preferred genres of video games according to gamers. The most likely reason for this preference for action over other genres is because it puts the gamer at the center of the picture, requiring them to demonstrate intelligence and reflexes in order to overcome a challenge (Grace, 2005).

Level of Problem-Solving Ability of Gen Z Students

Table 4. Frequency and percentage distribution of the Gen Z gamers and non-gamers according to their level of problem-solving ability

	Low	Below Average	Average	Above Average	High	Total
Gamers	6 2.86	22 10.48	50 23.81	22 10.48	5 2.38	105 50
Non-Gamers	8 3.81	21 10.00	44 20.95	28 13.33	4 1.90	105 50
Total	**14** **6.67**	**43** **20.48**	**94** **44.76**	**50** **23.81**	**9** **4.28**	**210** **100**

Table 4 illustrates the frequency and percentage distribution of respondents depending on their problem-solving ability. According to the data, the majority of Gen Z gamers and non-gamers had an average level of problem-solving ability, with a total frequency of 94, or 44.76 percent. It is also worth noting that 14 (6.67%) of the respondents have a low level of problem-solving ability, while 9 (4.28%) have a high level of problem-solving ability.

The table demonstrates that the level of problem-solving ability of both gamers and non-gamers is average. And interpreting the average level of problem-solving ability based on Table 2, it means that the majority of Gen Z are aware of the problem and recognize the value of a well-structured problem-solving approach, but they are inconsistent in their problem-solving approaches. Furthermore, they are adaptable to new situations, making it easier to find solutions to any problems that may arise (Hooda & Devi, 2018).

The results were identical to those of Baro and Paraon's (2017). According to the data, the average level has the maximum frequency of 61 (34.3 percent) and the lowest frequency of 5 for the high level (2.8 percent). Furthermore, the findings contradict Coombs (2013) argument that Gen Z lacks problem-solving skills since most are on the average level.

Significant Difference on the Gen Z's Problem-Solving Ability when Grouped According to their Profile.

Table 5. Test of comparison between the problem-solving ability of gamers and non-gamers

	Mean	**Sd**	**t-value**	**df**	**Sig.**
Gamers	93.85	7.33	.347	208	.729
Non-gamers	93.46	8.92			

significant at p<0.05
equal variance assumed since p-value=.055

Table 5 shows the t-test result between the problem-solving ability of gamers and non-gamers. The table shows that the mean scores of gamers and non-gamers on the solving problems scale is approximately equal. The test shows that the p-value is .729 which is greater than the level of significance which is 0.05. Therefore, the decision is to accept the null hypothesis. There is no significant difference between the problem-solving ability of gamers and non-gamers. The results implied that an individual's gaming status has no influence on their problem-solving ability.

The findings are consistent with those of Santos et al., (2019), who found no significant differences in problem-solving ability between gamers and non-gamers in terms of identifying the problem, identifying viable solutions, and applying solutions. Sanbaum and Burt (2017) did a related study to look at the statistical differences between gamers and non-gamers. They discovered that there is no significant difference in response time and puzzle solving problems between gamers and non-gamers. Moreover, it might be the case that transfer of video gaming skills in real life contexts might not occur (Unsworth et al., 2015 and Simons et al, 2016).

Table 6. Test of comparison on the problem-solving ability based on gender

		Mean	Sd	t-value	df	Sig.
Gamers	Male	93.68	7.21	.450	103	.654
	Female	94.21	7.68			
Non-gamers	Male	94.06	7.15	-.344	103	.732
	Female	93.20	9.60			

significant at p<0.05
equal variance assumed for gamers since p-value=.161 and non-gamer since p-value=.524

Table 6 shows the t-test result between the problem-solving ability of male and female with respect to gaming status. The mean score of male gamers is equal to 93.68 while the mean score of female gamers is 94.21. The mean score of male non-gamers is 94.06 while the mean score of female non-gamers is 93.20. The test shows that both p-values which are .654 and .732 are greater than the level of significance which is 0.05. Therefore, the decision is to accept the null hypothesis. There is no significant difference between the problem-solving ability of male and females with respect to gaming status. The findings show that gender has no influence on problem-solving abilities regardless of gaming status.

The study's findings differ with those of Malibiran et al. (2019) and Sumitha and Rexlin (2016), where both studies showed that gender had a role in students' problem-solving ability. However, the findings on problem-solving ability for gamers by gender are comparable to those of Dindar (2018), who found no gender differences in video gaming and complex problem solving even though males had more experience and abilities in video gaming and spent more time playing video games than females.

Table 7. One-Way Analysis of Variance of problem-solving ability by estimated number of hours spent per week playing video games

No. of hours	Mean	Sd	F-value	Sig.
1 – 5 hours per week	93.9118	7.16628	.264	.851
6 – 10 hours per week	92.5263	8.89674		
11 – 20 hours per week	94.2593	7.01423		
More than 20 hours per week	94.3200	6.89033		

significant at p<0.05
levene's test for equality of variance p-value= .630

Table 7 presents the result of Analysis of Variance of the problem-solving ability based on the estimated number of hours spent per week playing video games. One-way ANOVA shows that p value =.851 which is greater than level of significance which is 0.05. Therefore, the decision is to accept the null hypothesis, there is no significant difference in the problem-solving ability of gamers based on the number of hours spent per week playing video games. The results suggest that the estimated number of hours spent per week playing video games has little or no direct influence on the individual's problem-solving ability.

The findings are consistent with those of the descriptive-comparative research done by Baro and Paraon (2017), which found no correlation between problem-solving abilities and time spent playing video games. Similarly, Hancock (2010) found no link between social problem-solving skills and time spent playing video games.

Despite the fact that gamers' problem-solving abilities do not differ significantly based on the estimated number of hours spent each week, the data reveals that those who answered spending 11-20 hours and more than 20 hours per week had higher means of 94.26 and 94.32, respectively. The findings back with Posso's (2016) findings that students who played video games almost every day scored higher than the average in mathematics and science. He also mentioned that playing video games requires solving puzzles and necessitates the application of certain general math and scientific knowledge and abilities.

Table 8. One-Way Analysis of Variance of problem-solving ability by most played/preferred genre of video games

Genre Preference	Mean	Sd	F	Sig.
Action Genre	93.5789	8.01226		
Adventure Genre	94.0417	7.85454		
Puzzle genre	93.4444	5.91843	.171	.973
Simulation Genre	93.3636	8.05323		
Strategy Genre	95.8000	5.37070		
Shooting Genre	93.4615	6.77760		

significant at p<0.05
levene's test for equality of variance p-value= .834

Table 8 illustrates the result of Analysis of Variance of the problem-solving ability by the most played or preferred genre of video games. One-way ANOVA shows that the p value=.973 which is greater than the level of significance which is 0.05. Therefore, the null hypothesis is not rejected which indicates that there is no significant difference in the problem-solving ability of gamers according to the most played or preferred genre of video games. The findings show that video game genre preference has no effect on problem-solving abilities.

The findings do not support Chen's (2019) claim that certain video game genres can aid enhance problem-solving abilities. Video games, which feature a range of tasks, the need to work as a team, problem-solving tactics and approaches, and so on, can assist players enhance their problem-solving abilities, according to Chen (2019).

Regardless of the fact that there is no significant difference in the problem-solving ability when gamers are grouped according to genre preference, the data reveals that gamers who favor the strategy genre have the highest mean of 95.80. The results supported Adachi and Willoughby's (2013) findings that strategic video games improve self-reported problem-solving ability because strategic video games often require players to gather information and plan a strategy before attempting to solve a problem, which may improve gamers' problem-solving abilities.

Conclusion and Recommendations

This study aimed to show whether there is a difference between the problem-solving skills of gamers and non-gamers junior and senior high school students. The findings of this study add up to studies about gaming and problem solving that was conducted. In the study, it was shown that males are more engaged in video games. However, it cannot be denied that there are females who interact in video games. Both males and female gamers usually spend 1-5 hours playing video games per week and that the gamers only play for fun to ease their boredom whenever they have spare time. It was also revealed that the most preferred genre of video games is the action genre which shows that gamers preferred games that involve physical challenges, usage of weapons or tools and combat with other players.

In terms of problem-solving ability, Gen Z have an average level of problem-solving ability which means that most of the Gen Z are aware of the existence of a problem and recognize the value of a well-structured problem-solving approach. However, they are inconsistent in their approaches in solving problems. Moreover, there was no significant difference in the respondents' problem-solving abilities when grouped according to their profile. It means that an individual's problem-solving ability is unaffected by gender, gaming status, hours spent gaming, or genre choice. Furthermore, gaming abilities may or may not be transferable or applicable in real life.

In lieu of the findings, teachers might involve a variety of instructional methods that put the students' abilities to the test. Since students are drawn to games, educators may wish to incorporate educational games that are related to their lessons to capture their attention. However, teachers should utilize the games in moderation and not allow them to become a distraction. Gen Z should either play games that are beneficial to them or play in moderation so that it does not interfere with their daily routines like eating and sleeping. If gaming abilities cannot be applied to real life, they should strive to learn new things or engage in other activities that will help them improve their problem-solving or other skills and abilities. Gamers should only play games in balance; they should also strive to discover other genres of games to see what they can acquire. Game developers, on the other hand, should try to make an educational action-based game, such as one with in-game quests related, such games that help players improve their social, cognitive, and other skills. Future researchers might experiment with alternative approaches, research designs, instruments, and so on to learn more about how problem-solving ability is being influenced by various factors such as video games. They may want to evaluate different variables in relation to video games, such as spatial skills, cognitive skills, social skills, memory, and perception.

Acknowledgement

We researchers would like to express our heartfelt gratitude to all those who assisted us in any way, sharing their time, effort, and knowledge in order to make this research possible. To Dr. Riza B. Lintag, Dean of College of Education of Don Honorio Ventura State University, we would like to acknowledge her support and words of encouragement to complete this study. To our devoted parents, friends, classmates and teachers we would like to express warmest appreciation and sincerest thanks for giving us moral support, understanding, and spiritual guidance as we go on this research study. And above all, to our Almighty God, who provides a source of strength, wisdom and love without his grace and blessings this study would not have been possible.

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Students' Perception on Science Modular Learning Approach

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Abstract - This study was conducted to determine the perceptions of senior high school students of Don Felix Serra National High School on Science Modular Learning Approach as an entire group and when classified according to parent's engagement, sex, and strand. The respondents were the 100 students taken from the three strands namely: Accountancy and Business Management (ABM), Science, Technology, Engineering and Mathematics (STEM), and Humanities and Social Sciences (HUMSS). For this study, the researchers used the descriptive survey method of research in order to determine the perception of Senior High School students in the Modular Learning Approach as a new method of learning. The study revealed that the over-all perception of the respondents in the Science Modular Learning Approach when taken as a whole and classified according to parent's engagement, sex and strand is that Science Modular Learning makes them "feel challenged as a student". Also, it was revealed there were significant differences in the perception of the students on Science Modular Learning when classified according to parents' engagement and sex. However, when classified according to strand, no significant difference was noted. Based on these results, it may be concluded that Science Modular Learning Approach enables the students to become independent learners who can manage their time in working on their modules at in anytime and any place that they feel suitable for their learning style.

Keywords - Students' Perception; Science Modular Learning Approach; Parents' Engagement; Academic Strand; Sex

Introduction

Education is one of the key premises for a successful future. When people speak about education system, it must be an environment where talents and skills are being nourished and developed, and where knowledge and information are being held abundant. In the current situation of the world, sadly, the education system is one of the most affected. Schools all around the world are forced to closed due to the inherent danger of the Coronavirus (CoVid) 19 pandemic, and of the many countries in the world, the Philippines is one of the most affected.

The CoVid 19 pandemic has brought various changes and modifications in the education system of the Philippines. From the traditional face-to-face classes, the country has shifted its education system to distance learning as a precaution to the spread of the CoVid 19 virus, while continuing the demands of education. From this, distance learning has become the new norm in the education system of the Philippines.

Distance learning comes in different types depending on the available resources, one of which is the Modular Learning or the use of self-learning modules created by the Department of Education (DepEd). This type of learning approach ensures that students are able to remain engaged in the learning process while experiencing flexibility and convenience. Modular learning encourages students to be independent and to work at their own pace. In this type of learning approach, students are given self-learning modules every week and are expected to complete their task and submit their outputs depending on the schedules given by the school, which is usually every end of the week. Compared to the previous learning system that includes face-to-face interaction, modular learning is more comfortable and convenient, given the option that students have the feeling of freedom in this kind of new learning approach.

The only problem here is, as this type of approach is new to the education system, there are various factors to be considered as to how modular learning has affected the students in their education. Some of these factors are the following: (1) Parents are to stand as the new teachers for their child, (2) Modular learning emphasizes more on the most essential learning competencies, regardless of the learning capability of the students, (3) Technical Problems in the modules, (4) Lack of funding in the production and delivery of the modules, and (5) Struggles of students in self-studying. Herewith, modular learning approach still pose several skepticisms to itself as one of the new norm in the education system of the Philippines.

These are the reasons why there is a need in terms of knowledge and information regarding the perception of the students---as they play the key role in the education system; in terms of distance learning system primarily focusing on modular learning approach as the new system of learning.

Thus, the students' knowledge and learning in modular learning approach as a new method of learning is the key concern of the study. This determined how parents' engagement, sex, and strand affect the perception of students in science modular learning approach.

Methodology

Research Method. This study used the descriptive survey method of research in order to determine the perception of Senior High School students in modular learning approach as new method of learning. Descriptive method is also known as statistical research. It describes data and characteristics about the population or phenomenon being studied (Calderon, 2008). This research method fits in the study because the researchers used it to describe the perception of SHS Students of DFSNHS in Science Modular Learning Approach.

Respondents of the Study. The respondents of this study were the 100 Senior High School students of Don Felix Serra National High School (DFSNHS) from the 5 different strands: Science Technology Engineering and Mathematics (STEM), Accounting and Business Managements (ABM), and Humanities and Social Sciences (HUMSS). They were chosen through convenience sampling.

Data Gathering Instrument. The researchers used researcher-made questionnaire using a web application Google Forms to gather data from the respondents. It was composed of two (2) parts. Part 1, the Student's Profile and Part 2, the statements generated from the research problem. The questionnaire checklist underwent face and content validation from the chosen validators of the study.

Data Gathering Procedures. Before the distribution of the questionnaire, the researchers sought approval from the Campus Administrator. Once approved, the researchers started conducting the study. The researchers administered the questionnaire to the respondents using Google forms. The instructions for answering the survey questionnaire were provided by the researchers and were stated at the questionnaire form. Once the questionnaires were retrieved, the data were encoded and tallied. The researchers assured that all the responses were kept confidential and were used only for the purpose of the study. The researchers followed several actions and requirements that were reviewed and put in place to prevent the spread of COVID-19 in schools and into the community; and to ensure the safety of students and school staff while at school. They follow the WHO (World Health Organization) protocol recommended. First, the Community -level measures: Ensuring of physical distancing, hand and hygiene practices and age- appropriate mask use; shield vulnerable groups. Second, Policy, practice and infrastructure: Ensuring the necessary resources, policies and infrastructure, are in place that protect the Health and safety of all school personnel including people at high risk. Lastly, Hygiene and daily practices at the school and classroom level.

Data Processing Techniques. The gathered data for this study were tabulated. The data were analyzed using the Descriptive and Inferential statistics. Under the Descriptive Statistics, the mean was used to determine perception of students. Frequency count was used to determine the respondent's distribution in terms of parents' engagement, sex, and academic strands. The mean and standard deviation were used to determine the overall evaluation of the perception of the respondents in terms of their perception towards Science modular learning approach as a new method of learning.
For inferential statistics, t-test and Analysis of Variance (ANOVA) at .05 level of significance were used.

Results and Discussions

Part 1 which is the Descriptive Data Analysis presents the analysis of data concerning the frequency in terms of the distribution of the respondents according to parents' engagement, sex and strand. The mean and standard deviation presents the perception of students on modular learning approach as new method of learning as a whole and in terms of parents' engagement, sex, and strand.

Part 2, Inferential Data Analysis presents the analysis of data concerning the difference in the perception of students on modular learning when classified according to parents' engagement, sex, and strand.

Descriptive Data Analysis

Descriptive data is one of the most important steps for conducting statistical data analysis. It is the term given to the analysis of data that helps show or summarize data. In this study, Descriptive Data Analysis was used to determine the perception of Don Felix Sierra National High School Students on Science Modular Learning Approach.

Table 1. Profile of the Respondents

Characteristics	*N*	Percent
Parents Engagement		
Highly Engaged	18	18
Moderately engaged	62	62
Not Engaged	20	20
Sex		
Male	24	24
Female	76	76
Strand		
STEM	18	18
ABM	19	19
HUMMS	63	63
Total	100	100

Table 1 shows the profile of the respondents in terms of parents' engagement, sex and academic strands. In parents' engagement which was categorized into three (3): highly engaged, moderately engaged and not engaged, the result shows that 18%, of the respondents have parents who are highly engaged in their science modular learning, 62% were moderately engaged, and 20% were not engaged. In terms of sex, male comprised 24% of the respondents while the female comprised 76% which means that the respondents were mostly comprised of female students. For strands which are categorized into STEM, HUMSS and ABM, 18% of the respondents are from STEM, 19% from ABM and 63% from HUMMS. This means that most of the respondents are from HUMMS.

Table 2. Five Top Most Perception of student on Modular Learning Approach as a new method of learning when taken as a Whole

	Perception	*M (SD)*
1.	I feel challenged as a student	4.25 (.540)
2.	It helps me work independently	3.97 (.627)
3.	I appreciate the schools move to provide flexible plan in the new mode of learning	3.88 (.761)
4.	It allows me to become an independent learner	3.56 (.806)
5.	I can work at my own pace and convenience	3.81 (.692)

Table 2 shows the over-all perception of students on Science Modular Learning when taken as a whole. As revealed on the data, most respondents perceived Science Modular Learning as something that “makes them feel challenged as a student” (M= 4.25, SD= .540). This perception falls under the category of students’ perception in modular learning in terms of independent learning. This was followed by their perceptions that Science modular Learning “helps them work independently” (M= 3.97, SD= .627), which also falls under the category of students’ perception in modular learning in terms of independent learning. The third of the top most perception is “they appreciate the schools move to provides flexible plan in the new mode of learning” (M= 3.88, SD= .761), falling under a different category which is the perception of students in modular learning in terms new learning environment. Another perception is, science modular learning “allows them to become independent learner”, (M= 3.56, SD=. 806), which is also under students’ perception in modular learning in terms of independent learning. Finally, students perceived modular learning as “helping them work at their own pace and convenience” (M= 3.81, SD= .692), which falls under the same category of students’ perception in modular learning in terms of independent learning.

A study entitled, “Effects of modular and traditional approaches on students’ general comprehension”, a conclusion was made which explains that there are significant differences in terms of the general comprehension of students in modular learning and traditional learning. According to the findings of the study, students who are under the modular approach were able to gain higher mean score in their teacher-made general comprehension-based tests compared to students who were taught under the traditional learning approach”. (Malik, S. 2012). This signifies that students were able to learn more effectively in modular learning than in traditional learning approach.

Table 3. Five Top Most Perception of Students on Science Modular Learning When Classified According to Parent's Engagement

Variable	***M(SD)***
Parent's Engagement	
Highly Engaged	
1. I feel challenged as a student.	4.39(.520)
2. It allows me to become an independent learner.	4.28(.575)
3. It helps me work independently.	4.22(.647)
4. I appreciate the school’s move to provide flexible plan in the new mode of learning.	4.17(.618)
5.5. I can work at my own pace and convenience.	4.11(.583)
5.5. I can find a personal space that suits my learning style.	4.11(.583)
Moderately Engaged	
1. I feel challenged as a student.	4.27(.548)
2. It helps me work independently.	3.95(.612)
3. I appreciate the school’s move to provide flexible plan in the new mode of learning.	3.94(.721)
4. I find my teachers very supportive in offering resources which can be used to learn from home.	3.84(.682)
5. It allows me to become an independent learner.	3.82(.779)
Not Engaged	
1. I feel challenged as a student.	4.05(.759)
2. It helps me work independently.	3.80(.616)
3. I can work at my own pace and convenience.	3.75(.550)
4. I can seek other resources to find answers to the activities in my module.	3.75(.716)
5. I can find a personal space that suits my learning style.	3.70(.657)

Table 3 shows the five (5) top most students’ perception on Science Modular Learning when classified according to parent's engagement. For parents who are highly engaged, their top most perception towards Science Modular Learning were as follows: First, students perceived Science Modular Learning as something that “makes them feel challenged as a student” (M=4.39, SD= .520). This perception falls under the category of independent learning. This signifies that students still feel challenged in the new method of learning as an independent learner, even with high engagement of their parents. Second perception is, "it allows them to become an independent learner" (M=4.28, SD=.575). Third, students perceived Science Modular Learning as, "helping them to work independently" (M=4.22, SD =.647). Fourth perception, they "appreciate the school's move to provide flexible plan in the new mode of learning" (M=4.17, SD=.618), and lastly, they perceive modular learning as "helping them work at their own pace and convenience" (M=4.11, SD=.583) and "they can find a personal space that suits their learning style" (M=4.11, SD= .583). The first three and the fifth perceptions fall under the perception of students in modular learning in terms of independent learning. This signifies that students were able to recognize themselves as independent learners in the modular learning approach with high parent engagement. The fourth perception falls under the perception of students in modular learning in terms of new learning environment.

For parents who are Moderately Engaged, their top most perception towards Science Modular Learning were as follows: first, students perceived Science Modular Learning as "something that makes them feel challenged as a student" (M=4.27, SD= .548). Second, "it helps them work independently" (M=3.95, SD= .612). Third perception is, they "appreciate the school's move to provide flexible plan in the new mode of learning (M=3.94, SD=.721). Fourth perception is "they find the teachers very supportive in offering resources which can be used to learn from home", (M=3.84, SD= .682) and fifth, "it allows them to become an independent learner" (M=3.82, SD= .779). The first, second and fifth perception fall under the category of: the perception of students in modular learning in terms of independent learning while the third and fourth perceptions were under the perception of students in modular learning in terms of new learning environment. The results show that students' perception in terms of science modular learning with moderate engagement from the parents do not really go far with regards to the results of the students' perception with highly engaged parents.

For the parents who are Not Engaged, their perception towards Science Modular Learning were as follows: First perception, "they feel challenged as a student", (M=4.05, SD= .759). Second, "it helps them work independently (M=3.80, SD= .616). Third perception is, "they can work at their own pace and convenience", (M=3.75, SD= .550). Fourth is, "they can seek other resources to find answers to the activities in their modules", (M=3.75, SD= .716). Lastly, students perceived Science Modular Learning as, "helping them find a personal space that suits their learning style" (M=3.70, SD= .657). For students whose parents show minimum or no effort to be involved in their science modular learning, all perception falls under the category of independent learning, signifying students were able to recognize themselves as full independent learners.

According to certain study, parents' involvement in the works of the studies are one of the ways that highly influenced the students' motivation and engagement in different school-related stuffs. Parents who provide assistance and mostly engaged in the learning of the students help in developing learning, and the same time in providing support most especially in terms of time management and problem-solving (Moè et al., 2018). This explains the significant role that parents play in their child's learning and education.

Table 4. Five Top Most Students' Perception on Science Modular Learning When Classified According to Sex.

Variable	***M(SD)***
Sex	
Male	
1. I feel challenged as a student.	4.25(.608)
2. It helps me work independently.	4.13(.612)
3. I enjoy answering my modules together with my classmates.	4.13(.680)
4.5. I can balance my time between family and studies.	4.04(.859)
4.5. It allows me to become an independent learner.	4.04(.806)
Female	
1. I feel challenged as a student.	4.25(.592)
2. It helps me work independently.	3.92(.627)

3. I appreciate the school's move to provide flexible plan in the new mode of learning.	3.89(.704)
4.5. It allows me to become an independent learner.	3.80(.800)
4.5. I can seek other resources to find answers to the activities in my module.	3.80(.674)

The table 4 shows the top most students' perception about Science Modular Learning when classified according to sex. For students who are female, their top most perception towards Science Modular Learning were as follows: First, students perceived Science Modular Learning as something that makes them "feel challenged as a student", (M=4.25, SD= .592). Second is "it helps them work independently" (M=3.92, SD= .627). Third perception, "they appreciate the school's move to provide flexible plan in the new mode of learning" (M=3.89, SD=.704). Fourth perception; "it allows them to become an independent learner", (M=3.80, SD=.800) and the fifth perception is "they can seek other resources to find answers to the activities in their module" (M=3.80, SD=.674). All of the five perceptions except for the third perception fall under the category of students' perception in modular learning approach in terms of independent learning. On the other hand, the fourth perception falls under the category of students' perception in Science Modular Learning in terms of new learning environment. The results show that female students provide more perception most especially on the category of independent learning in this new method of learning, as well as to the new learning environment that they have acquired in this modular learning approach.

For students who are male, their top most perception towards Science Modular Learning were as follows: First, the students perceived Science Modular Learning as, something that "makes them feel challenged as a student" (M=4.25, SD= .608). Second, they perceived it as something that helps them work independently", (M=4.1, SD=.612). Third perception is "they enjoy answering their modules together with their classmates (M=4.13, SD= .680). Fourth and fifth, "it helps them balance their time between family and studies", (M=4.04, SD=.859) and, "it allows them to become an independent learner", (M=4.04, SD=.806). The first two and the last perceptions all fall under the category of students' perception in modular learning in terms of independent learning. The third perception falls under the category of students' perception in modular learning in terms of new learning environment, and the second to the last perception is under the category of students' perception in modular learning in terms of satisfaction as a new method of learning. The results show a variation in terms of those from the female student counterpart. Aside from showing emphasis on their perception in modular learning approach in terms of independent learning and new learning environment, the male students also show more of their perception in terms of their satisfaction in modular learning as a new method of learning.

A research study suggested that the differences in terms of the cognitive performance of male and female students mostly are the results of social and cultural factors and that there is no major difference in terms of the performances of either male or female when it comes to absorbing and displaying of information most especially in activities that involve difficult computations. (American Psychology Association, 2014)

Table 5. Five Top Most Students' Perception on Science Modular Learning When Classified According to Strand.

Variable	***M(SD)***
Strand	
STEM	
1. I feel challenged as a student.	4.28(.669)
2. It allows me to become an independent learner.	4.00(.686)
3. I appreciate the school's move to provide flexible plan in the new mode of learning.	4.00(.767
4. I can work at my own pace and convenience.	3.89(.676)
5 .I can seek other resources to find answers to the activities in my module.	3.29(.758)
ABM	
1. I feel challenged as a student.	4.21(.713)

2. I appreciate the school's move to provide flexible plan in the new mode of learning.	4.05(.705)
3. It helps me work independently.	4.00(.745)
4. I find my teachers very supportive in offering resources which can be used to learn from home.	3.89(.809)
5.I can balance my time between family and studies	3.84(.765)
HUMSS	
1. I feel challenged as a student.	4.25(.568)
2. It helps me work independently.	4.00(.568)
3. It allows me to become an independent learner.	3.87(.813)
4. I can work at my own pace and convenience.	3.83(.661)
5.5. I can find a personal space that suits my learning style.	3.79(.744)
5.5. I appreciate the school's move to provide flexible plan in the new mode of learning.	3.79(.786)

Learning when classified according to strand. Students are evenly distributed between the three (3) strands: Humanities and Social Science (HUMMS), Science and Technology Engineering (STEM) and Accounting and Business Management (ABM).

For students who are taking the STEM strand, their topmost perception towards Science Modular Learning were as follows: First, students perceived Science Modular Learning as "they feel challenged as a student", (M=4.28, SD=.669). Second, "it allows them to become an independent learner" (M=4.00, SD= .686). Third perception is "they appreciate the school's move to provide flexible plan in the new mode of learning" (M= 4.00, SD=.767). Fourth perception, "they can work at their own pace and convenience", (M=3.89, SD=.676) and fifth, they perceive Science Modular Learning as a means that "allows them to seek other resources to find answers to the activities in their modules", (M=3.29, SD= .758). All five of the perceptions except for the third perception falls under the category of students perceived Science Modular Learning in terms of independent learning, while the fourth perception is under the category of students perceived Science Modular Learning in terms of new learning environment. The results show that the students from the STEM strand perceived more the Science Modular Learning in terms of independent learning and as a new learning environment.

For the students who are taking ABM their top most perception towards Science Modular Learning were as follows: First is, students perceived Science Modular Learning as "they feel challenged as a student" (M=4.21, SD=.713), second, "they appreciate the school's move to provide flexible plan in the new mode of learning" (M=4.05, SD= .705), third perception, "it helps them work independently" (M= 4.00, SD= .745),fourth, students perceived Science Modular Learning as way in "finding their teachers very supportive in offering resources which can be used to learn from home" (M=3.89, SD= .809) and lastly, is "they can balance their time between family and studies" (M=3.84, SD= .765). For this data, the first and third perceptions were under the category of perception of students in science modular learning in terms of independent learning. The second and fourth perception fall under the category of perception of students in Science Modular Learning in terms of new learning environment, while the fifth is in the category which is in terms of students' perception in science modular learning in terms of satisfaction as a new method of learning. The results revealed that students from the ABM strands also have perceived Science Modular Learning in terms of their satisfaction aside from perceiving it in terms of independent learning as a new learning environment.

For students who are taking HUMMS strands their top most perception towards Science Modular Learning were as follows: First, students perceived Science Modular Learning as making them " feel challenged as a student", (M=4.25, SD= .568), second, "it helps them work independently", (M=4.00, SD=.568), third perception is "it allows them to become an independent learner" (M=3.87, SD= .813), fourth perception, Science Modular Learning helps them "work at their own pace and convenience", (M=3.83, SD= .661), fifth and last are the two perceptions which are "they can find a personal space that suits their learning style" (3.79, SD= .744) and "they appreciate the school's move to provide flexible plan in the new mode of learning", (M=3.79, SD=.786). All of the perceptions in this data except for one was revealed as under the category of students perceived Science Modular Learning in terms of independent learning. The latter of the two fifth perceptions, however, falls under the category of students perceived Science Modular Learning in terms of new learning environment. The results for the perception of the HUMSS students, show similarities with the way the STEM students show more value in their perception in science modular learning in terms of independent learning and as a new learning environment.

A study conducted by the researchers from the University of the East- Caloocan entitled "The Journey to Learning: Through the Learning Styles of the Senior High School Academic Strand Students A.Y. 2019-2020", concluded that the activities performed by the students affect their motivation to learn. It was stated that "students enjoy their learning when their preferred type of activities were performed". (Aventijado, K. et al., 2020).

The results show that in terms of distribution, the respondents were evenly distributed. It also shows that the top five (5) most perception of the students focus on the category of how they perceived Science Modular Learning in terms of independent learning, as a new learning environment, and also in terms of their satisfaction in modular learning as a new method of learning.

Inferential Data Analysis

The significant differences were determined in this research study. The t-test and Analysis of Variance (ANOVA) at 0.05 level of significance were used.

Table 6. Difference in the Perception of Students on Modular Learning in terms of Parents' Engagement and Strand.

Variables	*M*	$F_{(100,2)}$	*p*	*Remarks*
Parents Engagement				
Not Engaged	3.23			
Moderately Engaged	3.48	6.954	.002	Significant
Highly Engaged	3.78			
Strand				
STEM	3.46			
ABM	3.50	.026	.974	Not Significant
HUMSS	3.49			

Note. F ratio is the ratio of two mean square values. F value close to 1.0 means null hypothesis is true. Larger F value means the null hypothesis is wrong.
**significant at p < .05*

The table revealed that there was a significant difference in the perception of the students on Science Modular Learning when classified according to parents' engagement. The results in the F value (F= 6.954) is greater than 1.0 and the probability (p= .002) is less than 0.05 level of significance. Thus, the null hypothesis which states that there is no significant difference is thereby not accepted.

When classified according to strand, the data shown in the Table 7 revealed that F=0.026 is near to 1.0 and the p=0.974 is greater than 0.5 level of significance. From this result, it is implied that there is no significant difference in the respondents' perception of Science Modular Learning when classified according to strands Thus, the null hypothesis is accepted.

According to a study, students whose parents were greatly involved in terms of their studies has proven to show better performance in school. Inclusive to the role of the parent is also to act as their child's teacher (Fantuzzo, et al., 2004; Nyarkoand Vorgelegt, 2007; Toper, et al., 2010). With this, it shows that there is a significant difference in the way students perceive learning depending on how their parents get engaged in their studies. In addition, students engage themselves in learning the concepts presented in the module. They develop a sense of responsibility in accomplishing the tasks provided in the module. With little or no assistance from others, the learners progress on their own. They are learning how to learn; they are empowered (Nardo, M.T.B, 2017). Regardless of the strand, learners are able to adopt on the changes in the education system by simply doing their role as learners, and that is, to learn the concepts and information presented and delivered to them, as their own way of showing and making development and progress within themselves.

Table 7. Difference in the Perception of Students on Modular Learning in terms of Sex

Variables	***M***	***df***	***T***	***p***	***Remarks***
Sex					
Male	3.42	98	-2.568	.012	Significant
Female	3.70				

Table 7 shows difference in the perception of students on Science Modular Learning in terms of sex: male (N= 24) and female (N=76). The results indicate that t= 2.57 with probability less than 0.05 level of significance. This means that there is a significant difference in the perception of students on Science Modular Learning when classified according to sex. With this, the null hypothesis is not accepted.

From this result, it only means that students of different sexes perceive learning, more importantly modular learning, in a different way. This is the reason why there is a need as to learn the behavior and perception of both sexes to be able to create learning materials and strategies that will help both learners. Camarao (1990) believes that the instructional materials were the answer to the needs of developing countries like the Philippines with inadequate logistics and rapidly increasing school population. Instruction could be individualized and from it, students learn even when they are already out-of-school. He stated that the writers of the supplementary instructional materials should state the objectives in terms of learner's behavior and skills.

Overall, based from the accumulated results, there are significant differences on the perception of the students on Science Modular Learning approach as a new method of learning in terms of parents' engagement and sex. However, the strand of the students shows no significant difference in terms of their perception on science modular learning approach.

Conclusion and Recommendations

Conclusions

Based on the findings of the study, the following conclusions are drawn:

The Senior High School students of Don Felix Serra National High School feel challenged in terms of Science Modular Learning Approach as a new method of learning especially in the science subject.

Sex has significant effect in the way the students perceived Science Modular Learning Approach as a new method of learning. The difference between the male and female perceptions were: females perceived science modular learning as a method that helped them to become independent learners and that they have acquired new learning environment. For male students, the same perception was given added that male students also felt satisfied on this approach. On the overall outlook, males most likely perceive Science Modular Learning approach more positively than females who were more on coping and adjusting on this learning approach.

It can also be concluded that there are significant differences on the perception of the students on Science Modular Learning Approach as a new method of learning in terms of parent's engagement and sex. These two variables have affected the way the students perceived modular learning.

Recommendations

From the findings, the following recommendations were drawn:

First, the Department of Education (DepEd) key officials should strategize different ways for teachers to implement new techniques in their teaching strategies. This is to ensure that students are able to learn and have fun in science modular learning even as an independent learner.

Second, the school led by the principal should create even more different educational programs and strategies that will promote and maintain the improvement of the new teaching and learning and system.

Another, since the focused of this study is to learn the different perceptions of students on science modular learning, science teachers are able to acquire more knowledge of their students' strengths and weaknesses with regards to the science modular learning approach as a new mode of teaching and learning. Science teachers should use this information to create different learning styles and strategies that will best suit the interests and learning capability of the students.

Next, parents should exercise their roles as secondary teachers for their children, in order to create connection in their child's learning and to help make a positive learning environment, which can highly benefit the students in their education.

Another, students should learn how to cope with the conditions of the new teaching and learning system of the present time which is the modular learning approach in order to maintain their performance in their studies.

Lastly, a similar study for further investigation and more information should also be conducted in this area of education in order to expand the knowledge and with regards to the perception of students in modular learning approach. Future researchers should use this research study as a basis or reference for their future studies.

Acknowledgement

The researchers would like to extend their heartfelt gratitude and appreciation to the following persons for all the efforts, time, encouragement, and experience, and aid that they have provided for the realization of the study;

Dr. Sandra T. Examen, Campus Administrator, Iloilo Science And Technology University- Miagao Campus, for her valuable presence and encouragement, and for permitting to conduct this study and be realized;

Dr. Salome R. Magbanua, Head, Education Council, for her

Dr. Edsel O. Coronado, Division Chair, Science Department, for her valuable efforts and hardwork in making the conduct of the study possible;

Instr. Pelagio M. Muyong and Erma Nacionales, their research instructors, for providing valuable guidance, knowledge, and instruction that has greatly helped in the success of the conduct of the research;

Dr. Herminia N. Falsario, Dr. Jureca F. Nacional, Instr. Lorelie G. Sabando, for acting as the panel examiners of the research study, for their valuable time and effort in critiquing the research paper for the preparation of the final manuscript;

Instr. Joann G.Muyong, their research adviser, for the valuable suggestions, directions, and sincere time and effort that made the completion and success of the study possible;

Dr. Aurora N. Saquibal, Principal, Florence Luz G. Igcasan, Assistant Principal, and the whole faculty and staff of Don Felix Serra National High School, for allowing the researchers to conduct their study in their school;

Senior High School advisers of Don Felix Serra National High, for their warm accommodation and sincere aid in the conduct of the study;

Senior High School students of Don Felix Serra National High School, who were the subjects of the study, for the precious time and sincere efforts that they have shared with the researchers;

To the researchers' parents, Mr. and Mrs. Renato Dizon, Mr. and Mrs. Oldarico Operiano, Mr. and Mrs. Rey Pascua Sr., Mr. and Mrs. Jifrey Sarsua, brothers and sisters, for their support, love and understanding, that served as inspiration, strength, and motivation to the researchers to finished the study;

To relatives and friends, especially to Erwin Jones Saplada, for providing a helping hand most especially in times when the researchers needed their help;

Above all, to the Almighty GOD, for the light and guidance, for the unending support and inspiration, for all the blessings and most of all, for leading the researchers toward the success of the research study with safe body and mind.

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Relationships of English Teachers' Proficiency and Approaches to Students' Phonological English Language Learning

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Abstract - The study determined the relationship of English teachers' proficiency and approaches and students' acquisition of phonological English language learning. This study generally ferreted out the significance of teachers' practices in teaching English language as well as their approaches in using the language that surely impact the students' acquisition of phonological English language learning. This anyhow observed teachers' language fluency through their grammatical accuracy and sound production that were quite crucial in students' language learning aside from the fact that educators' approaches manifest and became a huge influence in students' learning. This used the descriptive correlational method of research that utilized frequency, percentage distribution and mean score, which were used in the presentation of level of importance in phonological accuracy practice, level of frequency in phonological accuracy practice, teachers' communicative fluency practice, teachers' use of pedagogical strategies as well as English teachers' approach. Pearson r - Correlations Analysis was also used to determine the relationship between English teachers' proficiency and English teachers' approaches to students' acquisition of learning phonological English language. With regard to English teachers' proficiency and students' phonological English language learning, it showed that there was no significant relationship that existed between teachers' proficiency in terms of level of importance in phonological accuracy practice, level of frequency in phonological accuracy practice, and teachers' use of pedagogical strategies, and students' acquisition of learning phonological English language. Thus, it accepted the null hypothesis stating that there was no significant relationship between teachers' efficacy practice and students' acquisition of phonological English language. As regards the English teachers' approaches and the students' phonological English language learning, it showed that there was a significant relationship existing between teachers' efficacy practice, teachers' teaching approach, students' language learning, and students' acquisition of learning phonological English language. Thus, it rejected the null hypothesis stating that there was no significant relationship between teachers' teaching approach and students' acquisition of learning phonological English language.

Keywords - grammatical accuracy; phonological accuracy; teaching approach; teacher's efficacy; language learning

Introduction

Language teaching is one of the challenging tasks that educators do teach aside from numerical encounters and scientific endeavors they are into. In the Philippines, language teaching has been evidently part of its educational system as it is imposed all along on the academic curriculum designed from kindergarten to collegiate level. English, specifically, is ideally learned by the Filipino students from their formative years until preparation for their imminent career. Besides, aside from Filipino subjects, there is no any other subject course being taken in Filipino language but English, instead. Despite the fact that English language has been strongly taught in all schools in the nation, a question of what and how the learners have learned in English after taking up numbers of its subject courses still arises and is deemed to be focused on.

A lot of factors possibly emerge merely to solidify ideas of where the students' language learning depends and lies on. Should it be emanating from their teachers, who facilitate English classes and unavoidably show proficiency through their speaking and writing skills trickled down to the students? Does the end point rely on the students' responsibilities for their own learning the fact that their teachers have already taught them theories and lessons from the books and experiential occurrences in and out of the classrooms?

Martinez Agudo (2017) viewed the significance and role of English as the most influential language of international arena of communication are now highly evident in the current globalized world. Hence, there would be a huge need for training qualified and competent language teachers, who view the importance of undergoing English as foreign language teacher education programs. Teacher's language proficiency is a crucial matter as far as learner's language learning is concerned. Richards (2017) raised an issue of what particular proficiency in English a teacher should have to be an effective English teacher. He emphasized that teacher's proficiency in language encompasses his knowledge on subject matter as well as his ability to teach in English. It is strongly believed that teacher's proficiency in English language is a huge help in the students' acquisition of learning (Park and Lee, 2006).
Another thing to take into account in language teaching is the teacher's grammatical accuracy, which is of big help as well in shaping students' appreciation of language learning. According to Nel and Muller (2010), teachers who have had low English proficiency made basic grammatical errors, incorrect use of tenses, spelling and pronunciation as well that would be inevitably acquired by their students, too. It is disheartening to know that teachers' ungrammatical expressions tend to be correct in the students' beliefs as they also apply it in their real communicative situations. Moreover, in language teaching, teacher's pronunciation cannot be discounted in students' acquisition of language learning as they learn out of listening and mimicking. The students tend to acquire a mesolectal English since it is the way their teachers produce sounds and unavoidably model it to them. Teachers inevitably transfer phonological errors to the students in a sense that amiss pronunciation, incorrect sound, stress and intonation pattern would be taught to the learners (Nel and Muller, 2010).

English Language in a Global Context

English has been treated differently by various people depending on their perception of this language. Some say that English is the language of privileged for many of the affluent people have taken advantage of using it in and out of their houses, circles of friends and all transactions that they are into. Some have claimed that it is the language of professionals for it has brought individuals to different worlds of different people with different perspectives regardless of their status in life. Whether or not these claims are true, it is agreed that the significance and role of English as the most influential language of international arena of communication are now highly evident in the current globalized world (Martinez Agudo, 2017). It is globally acknowledged as it is known to be an international language. However, a question of how well-versed a user of language would be is always at stake. A lot of ways in acquiring language learning are present and could be availed of as to ensure good English expressions. Karakas (2017) stated that individuals have generally acted on the assumption that good English is attained by speaking and writing grammatical English.

Moreover, in countries where English language education is part of the curriculum, it is expected that competent English is obtained in all academic institutions. Nevertheless, a claim from Ishaque (2018) in a study has stated that one's proficiency in English is not gauged by how the language is taught and spoken within the four corners of the classrooms but by the creativity and productivity of varied teachers and students as well. English basically needs a huge reformation as far as language teaching and learning to address to the sociolinguistic aspects of diversified teachers and students.

Teacher's Grammatical and Phonological Accuracy

Ho (2018) states that phonological accuracy is the use of accurate forms in which utterances do not contain errors that impair a language's phonological, syntactic, semantic, or discourse aspects. To put it another way, people came to believe that beginners studying English should utilize English as a correct form of grammar and structure.

Likitrattanaporn (2013) investigated the teaching English phonological and communicative fluency at Thai secondary schools which revealed that teachers have very highly positive attitudes on teaching phonology and communication manifesting in their activities assigned to their classes. However, teachers' attitudes did not coincide with the pedagogy taken in their classrooms as ought to be expected. It was also ferreted out that the teachers thought of themselves to have been sufficiently knowledgeable theoretically with regard to pronunciation and communicative activities but most of them would also desire to improve their teaching in these aspects. This shows a need for improvement for all English language teachers especially the non-native speakers.

To improve the linguistic and literary creativity in English classroom, language teaching needs to have a new approach of the world Englishes, which pays homage to differences in tones, accents and suprasegmentals of students and teachers as well. Likitrattanapon (2014) found out on his study that whenever learners pronounce English words or sentences properly, they would transmit meanings efficiently. Some of them remark that a correct accent improves mutual understanding. Pronouncing English sounds correctly results to efficient communications. Another study showed findings of their study that English as Foreign Language educators must be cognizant of their understanding and knowledge about speaking which emanate from their past education and language teaching explorations and experiences as well. Through this, teachers would be of huge support to students' acquisition of language learning, too (Tajeddin, et. al., 2018).

Teacher's Pedagogical Practice

Different teachers have different schools of thoughts when it comes to pedagogical strategies to apply in the class to ensure learning of the students. In teaching English language, wherein communication skills are deemed to be developed, a lot of strategies have been implemented to make the class as student-centered as possible. When identifying the notion of innovative pedagogical practices, it is critical to grasp what it means; it refers to attempts to initiate reform within the classroom as well as the inclusion of technical resources that have sparked the development of the information society (Kapur, n.d.).

One of which that seems apt to use when teaching phonological English language is the use of technologies. While it is necessary for a teacher to speak English with his students as frequently as possible, it is equally important for them to hear a diversity of voices and accents. Different models of spoken English can be obtained from audio recordings. This can assist students in pronouncing words correctly. Audio recordings bring variation to courses, and some students will like being in a technology-rich environment (OLC, n.d.) Another pedagogical strategy an English teacher may use to develop listening and viewing skill of his students is film-viewing. Films provide real linguistic input as well as a dynamic conversation framework in the classroom. They also provide a genuine glimpse of the language and culture, giving insight into local English speakers' daily lives (Kabooha, 2016). Some teachers have taken advantage of bringing students to communicative-functional situations to apply the lessons. As Theall (n.d.) says that there are numerous benefits to introducing real-life scenarios into classroom instruction. The relevance of content is illustrated by real-life instances, and theoretical material is applied in real-life circumstances to make content easier to understand. This helps students develop their communications in their daily engagement in and out of the classrooms.

Teacher's Efficacy

Moran, et. al., (Babaei and Abednia, 2016) mentioned that teacher self-efficacy deals with their beliefs on their capabilities to effectively perform a certain task to achieve a desirable learning outcome in a specific situation. Richards (2017) accentuated that the ability to effectively perform their roles as language educators and this is known to be teacher efficacy. Sabokrouh (2014) claimed that the researchers in education have profiled that the teachers' sense of efficacy has tremendous impacts on various aspects of teaching and learning. This is a thing that students have usually remembered about their teachers. Richard's (2017) finding in his study stated that language proficiency and teaching ability have been different entities. Basically, the ability to teach English through English is understood as possible as language proficiency problem. If teachers have improved the level of their teaching skills in English, they surely be able to teach English effectively.

In a study conducted by Sabokrouh (2014), it was found out that there was a significant relationship between the attitude and the teachers' English efficacy beliefs that was congruent with the profiled studies with regard to links between English students/teachers' attitude toward English as well as their confidence in themselves as English speakers. Moreover, Bandura (Babaei and Abednia, 2016) stated that these efficacy beliefs refer to main sources such as mastery experiences, vicarious experiences, and social persuasion as well as emotional and physiological states.

Teacher self-efficacy gets defined by Richards (2017) as pedagogical ability as teacher's knowledge of teaching that encompasses knowledge on the subject-matter, repertoire of methods and activities that a teacher uses. Indeed, there is really a need for an effective English teaching methodology (Ler, 2012). Hoy and Spero (Kaysigiz, et. al., 2018) stated that teacher self-efficacy plays a vital role on one's behavior as it has an effect on the culling out activities and efforts to put in performing a certain activity. Mashhady (Sabet, et. al., 2018) stated that successful teachers are able to choose apt teaching techniques in order to make a difference in students' learning outcomes. English teachers' self-efficacy may affect their educational and instructional applications and can foresee apt teaching methodologies to employ in the classrooms (Kaygisiz, et. al., 2018).

Methodology

This quantitative study utilized the descriptive correlational design to attain its objectives. This used descriptive survey and correlation type of quantitative research because it has dealt with the present situation, current practices, characteristics of groups of individuals and their behavioral patterns, attitudes as well as their opinions. The study was anent the English teachers' practices that have affected the students' phonological English language learning as considered important variables of this research. Moreover, the survey-questionnaire as adopted by the researcher was validated by other expert researcher.

To obtain the sample respondents of this study, the researcher employed a Two-stage Random Sampling technique. Two-stage Random Sampling is a process of selecting samples or groups randomly and then chooses individuals randomly from these groups (Fraenkel, et.al., 2013). Since there were limited movements and activities at present during the CoViD-19 pandemic and due to the restrictions given by the Inter-Agency Task Force for the Management of Emerging Infectious Diseases in the Philippines (IATF), the two-stage random sampling technique was far more appropriate in the conduct of this study.

The researcher deemed the faculty and students of the selected local colleges and universities (LCUs) in Metro Manila as the respondents of the study. These came from the Eastern Manila District (2nd District) such as Marikina City and Quezon City while some emanate from Northern Manila District [Camanava] (3rd District) such as Caloocan City, Malabon City, and Navotas City as well as Valenzuela City.

The researcher got the population of faculty and students, who had taught and taken up English subject during 1st semester, AY 2019-2020 in the local colleges and universities (LCUs) of the aforementioned cities to be the respondents of the study.

The questionnaires have been adopted to delve the teachers' practices in teaching English that would affect the students' learning of phonological English language. The researcher prepared two sets of survey questionnaires for the teacher and student-respondents respectively. The survey questionnaire for student-respondents has been divided into three (4) parts. The first part of the instrument refers to students' perceptions on their English teachers' efficacy practice, which affects classroom management as well as teaching environment and it would decide whether or not students get encouraged and challenged to learn the language. The second part of the instrument deals with their perceptions on their English teachers' teaching approach that is anent the pedagogical strategies being used in the class. The third part ferrets out data on students' level of understanding on language learning through personal applications in their daily engagements. Finally, the last part delves on students' phonological English language learning.

The second set of survey-questionnaire was furnished to the teacher-respondents and it has been divided into four (4) parts. The first part delves on teachers' perceptions on the importance of their phonological accuracy practice that has played a vital role in their students' language learning. The second part deals with the frequency evaluation on teacher's phonological accuracy that has reinforced to students' learning phonological English language. The third part refers to teacher's communicative fluency practice and the last part is anent the teachers' use of pedagogical strategies that have enabled the students to acquire learning of grammatical and phonological English language.

The researcher sought the permission of the selected local colleges and universities (LCUs) president or executive director or officer-in-charge to let him conduct the study in their respective academic institutions as the locales of this study through paying a personal visit to hand letters of permission as well as copies of the research instruments, which later on were translated into Google Forms since no faculty and students have personally gone to school for reporting. Some academic institutions were long wait in prescribing decisions to whether or not allow the researcher to conduct the study since some of them have been used as quarantine facilities as pandemic has been on. As soon as the approval got released, the researcher dealt with different personnel to be generated with the links to furnish to teacher and student-respondents respectively through their Google mail accounts, which had just been known to the respective personnel alone. After such, the gathered data were computed, tallied, and interpreted using the apt statistical tools and treatment.

Results and Discussions

This table shows the computed Pearson r correlation coefficient value between English teacher's proficiency and students' acquisition of learning phonological English language. As data gleaned from this table, there is no significant relationship that exists between teacher's proficiency in terms of level of importance in phonological accuracy practice, $r=0.349, p>0.05$, level of frequency in phonological accuracy practice, $r=0.444$, $p>0.05$, and teachers' use of pedagogical strategies, $r=0.142$, $p>0.05$, and students' acquisition of learning phonological English language. Thus, it is accepting the null hypothesis stating that there is no significant relationship between teacher's efficacy practice and students' acquisition of phonological English language learning.

Table 2. Composite Table of the Significant Relationship Between English Teachers' Proficiency and Students' Acquisition of Learning Phonological English Language Using Pearson r Correlation Coefficient

	Computed r	VI	Sig	Decision	VI
Level of importance in phonological accuracy practice	-0.235	LC	0.349	FR	NS
Level of frequency in phonological accuracy practice	-0.192	LC	0.444	FR	NS
Teachers' communicative fluency practice	-0.493	MC	0.038	R	S
Teachers' use of pedagogical strategies	-0.361	LC	0.142	FR	NS

The data shown above are construed by Open Learn Create (n.d.) by stating that it is necessary for a teacher to speak English with his students as frequently as possible, it is equally important for them to hear a diversity of voices and accents. Different models of spoken English can be obtained from audio recordings. This can assist students in pronouncing words correctly. Audio recordings bring variation to courses, and some students will like being in a technology-rich environment.

On the other hand, in terms of teachers' communicative fluency practice, there is a significant relationship being found, $r=0.038$, $p<0.05$. Thus, it is rejecting the null hypothesis that states that there is no significant relationship between teacher's efficacy practice and students' acquisition of phonological English language.

Table 3. Composite Table of the Significant Relationship Between English Teachers' Approach and Students' Acquisition of Learning Phonological English Language Using Pearson r Correlation Coefficient

	Computed r	VI	Sig	Decision	VI
Teacher's efficacy practice	0.560	MC	0.000	R	S
Teacher's teaching approach	0.735	HC	0.000	R	S
Students' language learning	0.671	MC	0.000	R	S

Legend: FR- Failed to reject HC- High Correlation LC- Low Correlation MC- Moderate Correlation R- Reject NS- Not significant S- Significant

Table 3 displays the computed Pearson r correlation coefficient value between the English teacher's approach and the students' acquisition of learning phonological English language. As data gleaned from this table, a significant relationship exists between teacher's efficacy practice, r=0.560, p<0.05, teacher's teaching approach r=0.735, p<0.05, students' language learning r=0.671, p<0.05 and students' acquisition of learning phonological English language. Thus, it is rejecting the null hypothesis stating that there is no significant relationship between teacher's teaching approach and students' acquisition of learning phonological English language. The results have been supported by the study conducted by Sabokrouh (2014), which found out that there was a significant relationship between the attitude and the teachers' English efficacy beliefs that was congruent with the profiled studies with regard to links between English students/teachers' attitude toward English as well as their confidence in themselves as English speakers.

Conclusion and Recommendations

Conclusions

Significant relationship between English teachers' proficiency and students' acquisition of learning phonological English language

The study shows that there is no significant relationship between teacher's proficiency (level of importance in phonological accuracy practice, level of frequency in phonological accuracy practice, and teachers' use of pedagogical strategies) and students' acquisition of learning phonological English language. Thus, it is accepting the null hypothesis stating that there is no significant relationship between teacher's efficacy practice and students' acquisition of phonological English language. However, in terms of teachers' communicative fluency practice, there is a significant relationship being found. Thus, it is rejecting the null hypothesis that states that there is no significant relationship between teacher's efficacy practice and students' acquisition of phonological English language learning.

Significant relationship between English teachers' approach and students' acquisition of learning phonological English language

The study shows that there is a significant relationship between teacher's approach (teacher's efficacy practice, teacher's teaching approach, students' language learning) and students' acquisition of learning phonological English language. Thus, it is rejecting the null hypothesis stating that there is no significant relationship between teacher's teaching approach and students' acquisition of learning phonological English language.

Recommendations

Since the study shows that teacher's communicative fluency practice has significant relationship to students' acquisition of learning phonological English language, it is recommended for English teachers to be more aware of all the activities they give their students in dealing with the lessons being taken. Teachers need to be provided ample training on how they conduct these activities efficiently. By doing so, they become more aware of the apt activities they could give students and they may avoid having a teacher-centered way of teaching over and above the different approaches to enhance students' phonological English language learning. There should be more communicative-functional activities to be involving students to enhance communication skills in English language.

As the study shows a significant relationship between teacher's approach and students' acquisition of learning phonological English language, teachers must reflect on how important their approaches are whenever they take lessons with the students. It is not only that they portray the roles they have as teachers, but their classroom management, treatments, and attitudes toward the students need also to be taken into account. The affective domain among students, aside form the cognitive to develop, also needs to be considered by the English teachers. The subject may not be that easy, but if teachers become more motivating for students to engage in the activities or making them feel that they can improve and do well in the subject, it is believed that students become little by little interested to participate and learn afterwards.

Acknowledgement

The researcher would like to express his sincere gratitude to his family and friends, who have always been the inspirations for aspiring the higher excellence God has designed for him. He also thanks Jabez and Lacey for being the sources of joy when staying at home and to God Almighty, who has made all these things possible. All praises, honor, and power belong to Him through Christ Jesus. Amen!

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"Thank God, I Did It": From the Voices of Re-Takers of Licensure Examination for Teachers

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Abstract - This study explored the phenomenon of the Licensure Examination for Teachers (LET) re-takers who had experienced failing before eventually passing the examination. Specifically, this examined the reasons, emotions/feelings, practices, and insights after finally passing the board examination. Using Edmund Husserl's descriptive phenomenological research design, this study was conducted using a face-to-face interview with the fifteen Licensed Professional Teachers (LPT) with previous experiences of failing the LET. After careful bracketing using Colaizzi's method of data analysis, findings revealed six major themes: readiness, mixed emotions, attitude, adversities, confronting difficulties, and insights. All of these themes represent the lived experiences that the examinees had gone through re-taking the examination. The CPs encounter of taking the LET for the second or more times provides some implications: re-considering the pre-conception of LET for better preparation; highlighting the importance and responsibility of family as a safety net in the event of failure; learning that with a goal, there is perseverance and with effort and hard work, there is improvement; and promoting the implementation of mental health and psychosocial support programs of educational institutions. The study concluded that the lived experiences of the CPs through their review materials, practices, physical and emotional conditions, challenges, and their coping mechanism all became a tool for them to learn, a way for them to mature, and the motivation for them in reaching for success.

Keywords - licensure examination for teachers; live experiences; review practices; physical and emotional condition; challenges

Introduction

Bitterness, misery, and depression are just some of the results of failure (Lakshmipradha, 2019). A horrible thing to experience but unfortunately, this is a common experience for most of the examinees who failed the Licensure Examination for Teachers (LET). However, some managed to stand firm, held their heads high, and continued to strive even when at first, they did not succeed.

Academic failure and mental health problems are strongly related had long been deemed a global problem (Roberts, 2018; Ajjawi, Dracup, Zacharias, Bennett, & Boud, 2020) - a global problem that the researcher wanted to further understand. It was mentioned by the Suicide Prevention Resource Center (2021) that mental health issues could have a detrimental influence on different aspects of a student's life, including their quality of life, academic success, physical health, contentment with their college experience, and as well as their relationships with friends and family members. These difficulties could also have long-term effects on students' future careers, earning potential, and general health.

Internationally, every country has its version of the licensure examinations for teachers. It has its own body of government that regulates and sets the standard for it. To mention some, the United States, unlike in the Philippines, has a decentralized system of teacher certification monitored by the national accreditation bodies (e.g., National Council for Accreditation of Teacher Education, NCATE). In Australia, teacher registration is a state responsibility and is carried out by statutory teacher registration bodies. However, unlike what is practiced here in our country, the registration bodies do not conduct any formal assessments in addition to, or separately from, those of the universities. Other countries like Japan, Hong Kong, Korea, and Singapore adopted the centralized systems of teacher certification. It is their Ministry of Education or department of education that governs almost all aspects of the teacher education and certification process (Wang, Coleman, Coley, & Phelps, 2003). These are just some of the gaps between different countries employing the teacher certifications. The fact that it widely differs from each other builds the foundation of addressing such research problems locally.

Attained data nationally presented by the Professional Regulation Commission's (PRC) official website, published in 2019, just for the five previous examinations, from March 2017 to March 2019, reveals that only a decent average of 21.58 percent of the elementary and 35.14 percent of the secondary LET takers have passed the examinations out of the total population of the examinees. This shows a total average of both courses with a 28.36 percent passing rate which proves difficulty in getting a spot of being a licensed professional teacher. From the total population of passers for the five previous examinations, from March 2017 to March 2019, the LET re-takers percentage on that population was only 27.90 percent. Further, in the news article published in December 2020, an issue had been raised regarding the low passing rate of the Licensure Examination for Teachers (LET) (Arcadio, 2020). Thus, this causes an increasing number of examinees who experienced failure and its setbacks.

Locally, it is undeniable that in the community of teachers in Midsayap and its neighboring municipalities, many have not yet passed the LET and have experienced failure firsthand. This is why the need to explore, understand, and acknowledge the struggles of the licensed teachers who also experienced failures.

From the traumatic experiences of some, failing an examination would make others stop dreaming, however, LET re-takers proved that success has its right time for everyone. As revealed in an article, all have the power to choose to see failure as "the end of the world" or, on the better side, as an incredible learning experience to treasure. Looking from a positive point of view, failures are important – it makes us grow, and keep us away on doing the same mistakes again. Furthermore, this article added that failure only stops us if we let them (MindTools, 2019).

As to how the re-takers overcome failure is a question worthy to be addressed. Some examinees had stopped dreaming yet some persevered and achieved success. The researcher is intrigued and wants to know the answers to these questions. The "hows" and "whys" of their lived experiences would finally be answered with the following research problems. For so many times of them trying the LET, we can now understand what they had gone through in reaching for success.

Methodology

Research Design. The study employed a descriptive phenomenological research design founded by Edmund Husserl (1970) as cited by Wojnar & Swanson (2007). This descriptive phenomenological research aims to explore and describe, through direct interaction, the lived experiences of the LET re-takers who eventually passed (Christensen, Welch, & Barr, 2017). It examined the insights, emotions/feelings, motives, and experiences of LET re-takers before, during, and after they finally passed the LET for many times of trying.

As proposed by Husserl (1970) as cited by Neubauer, Witkop, and Varpio (2019), the researcher must have transcendental subjectivity to describe the phenomenon in a universal sense purely. This is only possible through the process of bracketing (Tymieniecka; as cited by Wojnar & Swanson, 2007). Bracketing involves separating the phenomenon from the world and inspecting it; dissecting, defining, and analyzing the phenomenon to unravel the structure; suspending all preconceptions regarding the phenomenon and confronting the subject matter on its terms (LeVasseur; as cited by Wojnar & Swanson, 2007).

This research design is appropriate in exploring the phenomenon of the LET re-takers who eventually passed since it is essential in describing the lived experiences of the CPs, their way of coping with the challenges, and determining their insights and motivations throughout their experience.

Sampling Design. Snowball sampling was used in this study. It is a non-probability sampling technique. It is a recruitment technique in which research participants are asked to assist researchers in identifying other potential subjects (Oregon State University, 2012). Researchers used this technique to find people who may not want to be found (Glen, 2014). This was the best choice as a sampling design since the research investigated "failure," which is viewed as embarrassing (Gaffaney, 2016) and negatively connotated by society (Mirchevski, 2019). Through the process of referral from one CP to another, the researcher selected those that could provide depth and important data for the research.

Conversational Partners. The researcher had 15 conversational partners who participated in the in-depth interview. The CPs for this qualitative study were chosen based on the following criteria; (a) the CPs should be Licensed Professional Teachers (LPT), (b) have experienced failing the LET at least once or multiple times, and (c) should be currently practicing the profession. Excluded in this research were those who had passed the LET in one take and those who lived outside the PALMA area.

Instrumentation. Since this study is qualitative, the main instrument for data collection is the researcher himself (Bahrami, Soleimani, Yaghoobzadeh, & Ranjbar, 2016; Wa-Mbaleka, 2019; Roller, 2016; Xu & Storr, 2012). The researcher observed, took notes, and conducted the interviews (ATLAS, 2020). Additionally, the researcher made use of an interview guide validated by experts. This is a list of questions asked to the CPs during the interview. The order of the questions and the level of degree vary based on the type of interview conducted (Angus, 2020). To set first the mood of the conversational partners, the researcher asked questions that pertained to the demographic profiling. Following were the overarching questions: the shared experiences of the CPs with the LET, the challenges the CPs encountered and how they cope with them, their emotions during the first and second attempt, their motivators, and their advice for the future LET takers. The researcher practiced carefulness by using open-ended questions.

Data Analysis. The research utilized Colaizzi's (1978) method to guide data analysis in this descriptive phenomenological investigation.

It consists of the following seven steps:

1) Familiarization. The researcher familiarized the data collected by reading through all the CPs responses numerous times.
2) Identifying significant statements. The researcher identified all statements in the accounts that were of direct relevance to the phenomenon of the lived experiences of LET re-takers.
3) Formulating meanings. The researcher recognized meanings relevant to the phenomenon that arose from a careful consideration of the significant statements. The researcher used "bracketing" in the pre-suppositions to stay true to the phenomenon as experienced by the CPs.
4) Clustering themes. The researcher grouped the identified meanings into themes that were common across all accounts.
5) Developing an exhaustive description. The researcher wrote a full and inclusive description of the phenomenon, incorporating all the themes produced at step 4.
6) Producing the fundamental structure. The researcher condenses the wide-ranging description down to a short and dense statement that captures just those aspects deemed essential to the phenomenon's structure.
7) Seeking verification of the fundamental structure. The researcher returned the transcribed interview to ask whether it captured the CPs experiences. The researcher had gone back and modified earlier steps in the analysis in the light of the CPs feedback on the transcribed interview (as cited by Morrow, Rodriguez, & King, 2015).

Results and Discussions

After the in-depth interviews, the video and audio recorded exchanges were transcribed, translated, and analyzed. A cross-analysis in comparing the core ideas was utilized in the presentation of information. This was adopted after the guide written by Hill, Thompson, and Williams (1997) entitled, A Guide to Conducting Consensual Qualitative Research, which had made use of the three classifications of responses: general, typical, and variant.

The first classification is General, which means that the core idea applies to all cases (15 cases). Next is Typical, meaning the idea applies to half or more cases (8-14 cases). Lastly, Variant means that it applies to less than half to at least two cases (2-7 cases) (cited by Goodrich et al., 2019).

In categorizing the information, the themes were presented by research question and referred to as major themes. Under the major themes are the identified sub-themes; opposite to the sub-themes are the core ideas from the responses of the CPs. Another column was included in the table showing the frequency of the responses, which became the basis for the categorization.

Themes

There were 315 significant statements, and 6 formulated meanings were framed in the thematic analysis. Table 1 shows 6 major themes and 12 sub-themes that emerged from the subjective experiences of the conversational partners, specifically their lived experiences as LET re-takers. The core ideas and categorization were presented, and each major theme and sub-theme was discussed.

Table 1. Themes, Sub-themes, Core Ideas, and Categorization of the Lived Experiences of LET Re-takers who Eventually Passed

Major Themes	Sub-Themes	Core Ideas	Categorization
Readiness	Review Practices	Enrolled in a review center	Typical
		Pre-board exam given by the school	Typical
		Self-review	Typical
Mixed Emotions	Negative Feelings	Depressed	Variant
		Embarrassed	Typical
		Lost confidence and interest	Typical
		Negatively confident	Typical
		Nervous	Typical
		Self-doubt	Typical
		Unprepared	Typical
	Positive Feelings	Comfortable	Typical
		Determined	Typical
		Overjoyed	Typical
		Positively confident	Variant
Attitude	Failure Attribution	Not giving one's best	Typical
		Pre-occupied mind	Variant
		Taking the examination for granted	Variant
Adversities	Exam-Related Challenges	Examination technicalities	Typical
		Examination difficulties	Variant
		Financial difficulties	Typical
		Lack of focus	Typical
		Limited materials	Typical
		Undesirable application process	Typical
	Family Problems	Emotionally disturbed in the house	Variant
Confronting Difficulties	Positive Mindset	Be positive	Variant
		Need to work hard and focus	Typical
	Motivation	Avoid negative judgment	Variant
		Family encouragement and support	General
		Financial gain	Variant
		Self-Motivation	Variant
Insights	Success	Destiny/luck	Variant

	Self-reaffirmation	Variant
Learnings	Goal-driven Take the exam seriously	Typical Variant
Answered Prayer	Faith in God	Typical
Pieces of Advice	Give your best Never give up Patience and perseverance	Typical General Typical

The themes that emerged from the in-depth interviews are presented: Readiness, Mixed Emotions, Attitude, Adversities, Confronting Difficulties, and Insights.

Readiness

On the issues probed, lived experiences of the conversational partners in the aspects of review materials and practices, the essential theme readiness emerged. One of the most important things to do in taking an examination is to prepare and be ready for it. Being prepared entails being equipped with the abilities necessary to deal with what lies ahead and to both learn from and contribute to what is happening (University of Minnesota, 2015).

Readiness is composed of the sub-theme review practices. With regards to the study of Boe et al. (2007) on the importance of teacher preparations, they concluded that it is indeed crucial since, based on their results, teachers with extensive preparation in pedagogy and practice teaching earned a much higher level of full certification compared to those with minor preparations. The reason why all of the CPs have something to say with their preparation for LET supports the later study. Below are specific discussions of the sub-theme of the major theme readiness.

Review Practices

The conversational partners shared that their alma mater supported them, had the help of review centers, and had self-review as their preparation for LET. In this sense, the categorization of the core ideas, Enrolled in a review center, Pre-board exam given by the school, and self-review under review practices are all Typical.

The responses support the implications from the study of Bellen et al. (2017) about academic achievement as a predictor in the performance of licensure examination for teachers. Their findings implied closer attention as training in college days should be geared towards the graduates' success in the LET. About this, we now understood why there is institutional support given to the CPs.

It is noted with the CPs' responses that most of them have enrolled in a review center for their last take or before finally passing the LET. This further proved that review sessions in the review centers helped the CPs clarify questions about their materials and provide a valued metacognitive prospect to scrutinize what they know and do not know, as accounted in the study of Bord (2008).

Though CPs had said that most of them have enrolled in a review center for their last take, there were still a few who had enrolled for their first examination; however, they did not pass. Also, despite having the different interventions of the school in preparation for all of the CPs' first examinations, it is still not enough for them to pass the examination. This only proves that failure is bound to happen somewhere along the line, as Lakshmipradha (2019) believed. Furthermore, Llego (2017) enumerated many reasons why most takers fail the Licensure Examination for Teachers. These reasons would be discussed as we delve more into the responses of the CPs.

On the other hand, some of the CPs shared that they opted with self-review as one of their review practices, especially to those times where they had not had a review center yet, to those who had never enrolled in a review center, and to those who exerted extra effort beyond the review center. This was with

Knowles's Theory of Andragogy or adult learning (as cited by Guiter, 2014). He stated that as the learners mature, they become self-directed. Furthermore, Loeng (2020) explained that Self-Directed Learning (SDL) is a process that enables individuals to develop and implement their own learning goals, strategies, and evaluate their learning outcomes. Also, as part of their self-review, some CPs revealed that they usually study early in the morning alone. CP14 shared, It was also good to have a review early morning. At three o'clock in the morning, I would wake up already. I would stay in the next bedroom so that no one would see what I was doing there. That's my technique… It was good to review early morning. It can easily sink in. As stated by the CPs, they were more comfortable studying early in the morning as they believed that what they were reading was absorbed more by them. This further gave proof to the article of Oxford Learning (2017). They revealed that students tend to be more focused during the day and have a better chance of absorbing information. This is because a good night's sleep helps them to maintain a healthy mind and body. Dante (2015) also added that studying during the day can help us get through the day since we are refreshed and ready to face the day. It is also a smart choice to improve productivity.

With their self-review, focus for them is important, especially after experiencing failure. Focus is indeed important for it is the doorway to all thinking: perception, memory, learning, reasoning, problem-solving, and decision-making (Taylor, 2014). As CP11 stated, On the second time, aside from having a review center, I also read at home. I took it seriously already. Every night I studied. I looked back to where I was lowest. This phenomenon was further explained by the Achievement Motivation Theory by McClelland et al. (1953), as they have suggested that reactions to failures, such as revealed by the CPs, are predominantly determined by perceived task difficulty and either or both of two personality variables: namely, the motive to succeed and the motive to avoid failure. This was a possible explanation for why the CPs said they were more focused during their next attempt to take the LET because they were motivated to succeed or afraid to fail again. One way the CPs showed that they were serious in their review was by collecting various review materials. As written by St. Olaf College (2021), materials are an important mode for student learning. As shared by CP01, … I still had the initiative to collect and ask for other review materials just to cater and study what I needed to study and the things that I hadn't studied yet. CPs shared that they used their old notes, books, online resources, purchased materials, factsheets, handouts, news, and even current events on the television. This supports the article written by Zhara (2021). She revealed that there are different available resources in the forms of books, web-based learning materials, libraries, online libraries, videos, the internet, and media, which are most beneficial to diverse learners.

Mixed Emotions

It is already unavoidable for emotions to play a part in the experiences of the CPs. Emotions are discussed since it has a possible effect on how a person thinks and behaves and influences the decisions they make in their lives (Cherry, 2021). This section provides a discussion of the conversational partners' emotional conditions during the examinations. The major theme, Mixed Emotions, includes the sub-themes Negative Feelings and Positive Feelings. Compte et al. (2004) revealed that emotions had been shown to influence performance. Positive emotions can help for better performance, while negative emotions might be a hindrance.

Negative Feelings

In the understanding of the negative feelings felt by the CPs, the core ideas, Depressed, Embarrassed, Lost confidence and interest, Negatively confident, Nervous, Self-doubt, and Unprepared emerged. These core ideas were in congruence to the article "Perception of failure" (EPFL, 2020), which discussed failure, which is perceived as a painful experience; touches one's self-esteem, and invites judgment by others; it is painful in a social context of performance, professional success, and profitability; leaves one feeling surprised, helpless, shocked, sad or panic-stricken; leads to demotivation, loss of self-confidence, questioning one's abilities; is a situation where it is difficult to take stock; may leave one unable to look for the necessary help or information; causes questioning of one's choice of education; obliges one to let go of a professional and personal project.

In the case of CPs' reaction to failure, it only proved that they negatively experienced failure. These findings support the claims of Winch (2015), who said that failure could make an individual feel helpless and hopeless, explaining why the CPs cried.

On the CPs, being depressed and embarrassed served as a piece of additional evidence to the study of Eichfeld (2020), who defined that failure includes the aspect of pain, humiliation, and distress. CP06 talked about her crying for a month by stating, I cried maybe for almost a month also… I had cried so much during my first take, which I didn't pass. CP10 also experienced depression to the extent that she would cut her hair bald by saying, After the results came out, I immediately went home… staying for one week… I went through a depression that was so much for me… I cried. I cried so much for the whole day. There's so much regret because I hadn't passed even when I studied hard… I felt like I want to cut my hair and make myself bald. I couldn’t accept that I didn't pass. Embarrassment was occurring in the statements of CP11 as she said that she should have been helping her family already by uttering; it's embarrassing. It was like something fell upon you that's heavy... "This should already be the time that I could help my family, yet I just wasted it." It was really me.

Beaton (2020) also added that failure harms future performances, thus explaining why CPs somehow lost their confidence. CP13 talked about losing her confidence as she described herself like a candle melting by stating, I felt terrible. I was like a candle that melts. I somewhat felt stressed. Failing multiple times, CP14 shared that she lost interest along the way by affirming, Having experienced failing numerous times, I said to myself, "I'm tired. I'm tired already."

The core idea negatively confident describes the CPs who were too confident in taking the examination, which was disadvantageous in their preparation and attitude towards it. As Llego (2017) mentioned, confidence is a good thing; however, having so much of it can be dangerous because it could also be a reason for failing, for it leads to underperformance. The statement of CP09 proved this; I haven't taken the readings and review seriously. It was also because I just trusted myself too much. It was all a "come what may" during my first time. It also explains that people tend to overestimate their likelihood of success relative to either other people or in situations not involving others. Economists frequently see these biases as "judgment flaws" or "pathologies" that can only harm an individual's well-being and should be remedied. Additionally, some of the CPs even came to the point where they were just taking the examination for granted. CP03 mentioned, Maybe... It was just all for fun that time (yaga-yaga). Maybe I was just too at ease though it is already so difficult... especially with the professional education. This statement alone proved that CPs took the examination for granted and lacked the commitment to do well truly. This kind of behavior was described by Michael et al. (2016). He said that commitment is crucial for the individuals' behavior to be predictable in the face of instabilities of desires and interests. Simply speaking, if the CPs wanted to pass the examination during that time, they should have the commitment to predict their needed task to accomplish, for them to achieve such desire.

Santos-Longhurst et al. (2019) shared that nervousness is a common experience to everyone brought by the body’s stress response with either good experience and negative ones. Such occasions link to taking the examination just like what the CPs have gone through. Furthermore, nervousness is a mix of tension, dread, and exhilaration all at the same time. Your palms may sweat, your pulse rate may rise, and you may experience a fluttering uneasy stomach. This is indeed very similar to the accounts of CP05 stating; During the exam itself, I was nervous, of course. Even at first with my name, I already had a mistake. I was shaking while writing. It's like I was nervous.

Lakshmipradha (2019) explained that fear of failure immobilizes an individual, restricts an individual to their comfort zone, prevents one from moving forward in life, and hampers the individual's chances of success which are experienced by some of the CPs who lost interest. Lastly, Lin Grensing-Pophal (2019) also revealed that one of the consequences of failing includes poor morale, which is nearly related to why the CPs are experiencing self-doubt. CP06 also felt terrible about himself, thus experiencing self-doubt as she shared; Whenever I look into a mirror, my tears would drop. The thing is that you can compare yourself to others, thinking, "I know I'm better than them; however, why did I not pass?"

Unpreparedness has also been a negative feeling felt by the CPs, which could also be caused by feeling tired or stressed. CP08 expounded it as she explained, Also, my sleep, I was stressed that day... I was not prepared that day… I was not emotionally ready at that time (first exam). I was also not feeling well. This emotion is similar to what was described by the Queensland Government (2021) that examination stress could be caused by the feeling of unpreparedness or having no time to study. The findings also gave more evidence to the claims of Killgore (2010) in his study that the effects of sleep deprivation on cognition have varying effects that reduced attention and greater irregularity in behavioral reactions. These are two of the most persistent impacts of sleep loss or being tired. This would then result in negative emotional bias in mood, perception, and memory, as well as decreased frustration tolerance and difficulty using emotion to guide decision-making adaptively. This was similarly experienced by CP03, stating, Also, I'd been so sleep deprived during that time because we needed to accomplish the grades. I was already employed in a private school. I really could not forget that time since after making the grades, I needed to have my review, then the day after was the exam. I felt like I might faint at the testing center.

Positive Feelings

This section discusses the positive feelings felt by the CPs as four core ideas emerged: Comfortable, Determined, Overjoyed, and Positively confident.

Starting with the core idea comfortable, the CPs described that, unlike their previous examinations, the situations became more favorable to them. As shared by CP13 on being at ease, On my fourth (last) exam, I was already feeling… I was already at ease because my child was already big enough. So, my mind that time could already concentrate on the exam… I was just happy to take the board (exam) during that time… After going inside the examination room, my mind was just relaxed. The exam was just okay for me during that time… My mind was sound. CP08 also added to her being relaxed, saying, There I felt relaxed… With my second time, I traveled a day before the exam. So, I had the time to relax. It is also important to note that all of the CPs experienced these kinds of positive feelings on their last or second examinations, thus proving beneficial to them. This supports the article written by Clarabut (2019). He mentioned that when we relax, blood flow around our bodies improves, providing us with extra energy. It increases positive thinking, focus, memory, and decision-making by allowing us to have a calmer and clearer mind.

The CPs shared that on their succeeding takes, especially with their last examination and after experiencing failure, they had been more eager to pass. This kind of experience led to the creation of the core idea, determined. This was explained by the Achievement Motivation Theory of McClellan et al. (1953). The theory suggested that reactions to failure are determined mainly by perceived task difficulty and either or both the motive to succeed and the motive to avoid failure. The motive to succeed was evident by all of the ideas expressed, while CP14 also voiced the idea of the motive to avoid failure in her statements. Furthermore, their eagerness appears because of them wanting to return the favor. Dancel (as cited by Rungduin et. al, 2016) highlighted "utang na loob" as a source of motivation for Filipinos to do good things to others and is described to be a pillar of "kagandahan ng loob" (an inner sense of meaning to do good). This Filipino culture explains the motivation of the CPs as they wanted to return the favor to the people who helped them. Specifically, CP09 experienced it first-hand, saying, With the second (last) exam, I wanted the assurance since it was already embarrassing, and someone was paying for me… I also wanted to pass the exam that time because it was still them who sponsored my expenses for the exam.

On the CPs, reactions of being overjoyed are part of the reaction towards success. Chowdhury (2019) studied that the relationship between gratitude and happiness is complex. She said that gratitude, not only to others but also to ourselves, elicits pleasant feelings, most notably happiness. Furthermore, according to Emmons and McCullough (as cited by Chowdhury, 2019), that gratitude is a positive emotional reaction when receiving a reward from someone. In the CPs' case, the reward they received was success, and that someone they believed who gave it to them or helped them achieve it is either God or their family. Aragón, on the other hand, attested that people do cry out of positive feelings (as cited by Vinopal, 2017).

Unlike the previous core idea, negatively confident, the CPs' last examination embodied the core idea positively confident. The core idea of positively confident entails the confidence achieved by the CPs through hard work and the perception of the favorable things happening to them. As shared by CP09, During the exam, I was already so motivated. This was because I already read some of the questions from the exam in my reviewers. It was really an advantage to have read something rather than to depend on our stock knowledge solely… With my second attempt, physically, I was fit. Emotionally, I was ready because of my one-month preparation. This finding supported the study of Compte et al. (2004) entitled Confidence-Enhanced Performance. He emphasized that people with optimistic perceptions would perform better on their initiatives, increasing their chances of success. This showed that interventions and actions are needed for confidence to increase performance truly.

Attitude

Attitude is defined as a manner, disposition, feeling, or position concerning a person, thing, or situation (Dictionary.com., 2021). This is important to discuss to know how the CPs deal with the examination and their attitude towards it. This section provides discourses of the conversational partners on where they attribute failure. The major theme, Attitude, includes the sub-theme Failure Attribution.

Failure Attribution

In the attribution of failure, the CPs' responses formulated three core ideas: Not giving one's best, Pre-occupied mind, and Taking the examination for granted. These developed ideas are vital since it is highly related to the Attribution Theory of Bernard Weiner (1985) suggesting that an individual's attributions in an attempt to explain their failure determine the effort they are willing to exert in the future. How the CPs attributed their failure described their kind of motivation on their succeeding examinations.

The core ideas - not giving one's best, pre-occupied mind, and taking the examination for granted - are attributions to failure that are all controllable. All of these were explained by the Attribution Theory (Weiner, 1985). It says that if students attribute their poor performance to a lack of important skills or poor study habits, or simply controllable factors, they are more likely to persist in the future (Anderman, Hicksm, & Midgley, 2007).

Furthermore, Wen (2018) held that individuals are more prone to accept credit for accomplishment if their performance comments or test results are favorable to boost their self-esteem. However, individuals may prefer to blame failure on external sources if performance feedback or test results are bad to maintain their self-esteem. Though it is also understandable for CPs to attribute failure to external forces, LET is not a walk in the park, as Arcadio (2020) described. He revealed more that LET for prospect test takers is advised to prepare months in advance. However, despite the preparations, the passing percentage still decreased over the years.

Adversities

Problems for the CPs were already part of their everyday experiences towards taking the examination. Achieving success had not been easy for them because of the different hardships they went through. This section provides a discussion of the conversational partners' challenges experienced before and during the examinations. The major theme, Adversities, encompasses two sub-themes which are Examination-Related Challenges and Family Problems.

Examination-Related Challenges

In the explication of examination-related challenges, the core ideas are Exam technicalities, Examination difficulties, Financial difficulties, Lack of focus, Limited materials, and Undesirable application process.

CP02 and CP07 described examination technicalities and examination difficulties: I failed, maybe because of the shading. As they've said, we need to shade it perfectly, and erasures were not allowed; The choices in a question are related; it can be confusing. This supported the study of Bitang et al. (as cited by

Abrea et al., 2019), for they have found out that most of the LET test items require logical reasoning and have confusing words.

Financial difficulty is aligned with the idea in the Borgen Project (2020) article that more than 16 percent of Filipinos live below the poverty rate, thus struggling to afford even the basic needs. The findings also support Llego's (2017) idea that money hinders the examinees from acquiring enough review materials unless for those who had someone to borrow materials from. Additionally, the findings also support the article in LETPasser.com. (2017) as they revealed that reviewing for the LET can be difficult if the number of review materials is limited.

Lack of focus was also a challenge for the CPs as they already have other priorities such as family and work. CP02 stated that, With the problems about money and work, I didn't have a good review for me and was not confident… Since I had my Saturday weekend class, my time was also divided. This statement supported the article of Oxford Royale Academy (2020) as they identified that one of the problems in studying is the distractions and lack of concentration caused by many external stimuli. Furthermore, some CPs even mentioned that time pressure caused them to lose focus, especially during examinations. As CP08 shared, The questions somewhat would not sink into me. It took time for me, so I hadn't focused that time. Similarly, it was also described by the Queensland Government (2021) that pressure in the examination causes stress. This explained why the CPs felt that the questions could not sink into them, for they experienced this kind of stress.

Moreover, the CPs also enunciated that the undesirable application process for the LET posed a challenge to them. As described by CP14, The waiting line was so long… It was so hot those days. We did not have anything to cover us… The applicants were already fighting. They were already pushing each other. CP05 also added that; …during the application, even if I was four months pregnant, I slept near a comfort room at the Kidapawan terminal. I just had a blanket… it was a hassle… it seemed like we had gone through much pressure already. Since I needed to travel, I also needed to have money. You should set aside a budget for it; and patience. Their statements explained why they labeled the application process for the examination as undesirable. The hot temperature of the venue, their board and lodging, the financial strain, their physical situation, and the required documents were just some instances that made the application process more difficult for them.

Family Problems

Suazo (2018) stated in his study that family orientation is very crucial to Filipinos. Further, Diversify OSS (2016) added that family is always a priority to Filipinos. This explained why CPs were prone to family-related problems such as the emerging core idea Emotionally disturbed in the house.

Since family orientation is crucial to Filipinos (Suazo, 2018), having a problem at home could affect the CPs in relation to the core idea, emotionally disturbed in the house. Bennett (2021) exposed that family issues such as divorce, financial strife, and bullying can have detrimental effects on the individuals involved and impede academic performance. CP14 genuinely experienced this as she stated, Maybe, that time, it was a hindrance that I already have a family during the examination. Of course, because of the problems, financial, and other family problems, maybe those were the hindrances of my life, which was why I never passed that time. There's the problem with my husband. Sometimes, my husband couldn't understand. He was demanding... I was crying even when taking the exam because of the problems. It was because I couldn't understand my husband. We're not okay… The thing that even before I went for the exam, before that night, we fought.

Additionally, out of financial incapability, some of the CPs are already working at an early stage of their adulthood to either provide or help ease the finances of their family, which in turn affected their priority and performance as examinees. As CP02 said, … I was struggling since I couldn't focus. With the problems about money and work, I didn't have a good review and was not confident… We were well provided by reviewers; however, I couldn't focus because of my work… I really couldn't concentrate since while having my review, I was already working at MCC. Therefore, it was challenging for me to manage my time… My mind and body were already tired. If you're a working student, there's a lot to do."

Confronting Difficulties

For the CPs, a way to get through difficulty is to went through it. Confronting the challenges head on had been a way for most of the CPs to persist and continue. This also indicates their acceptance with the challenges and its existence and attempt to cope with it. This section provides a discussion on the accounts of the conversational partners on how they cope with the challenges and their motivations. The major theme, Confronting Difficulties, had Positive Mindset and Motivation as a sub-theme.

Positive Mindset

As expounded by Cherry and Snyder (2019), positive mindset was about making the most of the bad situations, trying to see the good in others, and viewing one's abilities in a positive light. The CPs lived this in two core ideas: Be positive and Need to work hard and focus.

Kirkegaard-Weston (2005) believed that positive thinkers recognize that awful things could happen, but they have faith that everything will turn out as it should. The CPs maintained an optimistic attitude since they were aware that they were still on the path to reaching their goal. Being positive was exemplified by CP05, stating, Of course, we all have fears; however, I just overcame it. It's like, I had a full conviction already… "It's okay! Let's go! I can do it! All of these would go somewhere!"

How the CPs handled problems, especially with their finances, was by working hard. The CPs needed to work hard to answer their financial needs on both for their house and the examination. On the response of CP15 on how she overcame the financial problem, she answered, I just saved some money. I've been a seller before… Even before, I was "madiskarte" and "raketera." I was not dependent on my parents already. This reinforced the paper of Lapeña et al. (2009), saying that being "madiskarte sa buhay" (resilient and resourceful) facilitates problem-solving. The CPs also mentioned that they were focused on their review and study, with the application process, examination content, and other challenges faced to achieve their goal of passing the LET. Thus, these are connected to their being hard working.

Motivation

In discovering the motivations of the CPs, the core ideas, Avoid negative judgment, Family encouragement and support, Financial gain, and Self-motivation, emerged. This section perfectly fits the Achievement Goal Theory of Martin Maehr and Akane Zusho (2015). This theory specifies that these kinds of goals direct achievement-related behaviors. This kind of behavior would directly relate to and explain the actions and motivations of the examinees.

The avoidance of negative judgment became one of the motivators of the CPs. CP15 shared, Because we were challenged by our aunts… We were just poor. There're many situations that pushed me. My boss belittled me. Whenever there are big occasions, we were just servants with my siblings… If I could describe it, my life was full of spices. I just said, "Time will come, I can reach it if given… So that they won't belittle me anymore... These kinds of negative experiences and emotions, as written by Study International Staff (2018), could turn into a positive force that could accomplish great things similarly experienced by the CPs as they made it as their motivation. Moreover, this kind of situation relates to the Reactance Theory by Brehm (as cited by Fyans, 1980). It states that if an individual's behavioral freedom is threatened, they would motivationally be aroused and attempt to restore their freedom. Also, the findings support the Regulatory Focus Theory by Tory Higgins (1998), which relates the hedonistic principle to motivation. This means that people's behavior in approaching pleasure and avoiding pain is a motivational principle, just like what the CPs shared in avoiding negative judgments as their motivation.

Having the family's encouragement and support is a common motivation for all 15 conversational partners. This supports Muola's study (2010) by proving that one of the determinants of academic achievement motivation is the home environment or family. He indicated that both are positively related. Achoui (2004) also concluded in his study that financial assistance, encouragement, and follow-up from family members have a favorable influence on students' success. Also, parent's impact is one of the influences of motivation. Family support is part of a healthy mindset since it contributes to the security of its members (Suazo, 2018). Since all of the CPs identified their family as one of their motivators, this added more evidence to the study of Panopio et al. (as cited by Suazo, 2018. He revealed that family is seen as a line of defense against a hostile world and a support system for when a family member has a major problem.

On the other hand, financial gain was also mentioned by some of the CPs as their motivator. However, Furnham (2012) and Scott-Clayton (2011) stated in their respective study that money as an effective motivator is debatable. This was further proven by the statements of the CPs who mentioned money as motivators for it is still rooted in the benefit of their family. Here is one response by CP03 stating, The thing that motivates me to pass was, of course, for us to have a greener pasture...so that we could apply in a public school... if my salary is already high... I could already help my parents… My only motivation to re-take the exam was to enter (work) in a public school to receive a high salary.

Lastly, it is also good to note that self-motivation also emerged as a core idea. As CP11 stressed; Actually, number one was really me (who motivated myself). Maybe, my relatives and family were just secondary, but the primary motivator was my eagerness to take the exam. I needed to take the exam. I needed to work. I needed to help. I needed to show them that I could do it. This was again in support of Achoui's (2004) study, for he concluded that one of the influences of motivation is self-desire.

Insights

A good thing about difficult experiences is the learnings in the end. The insights shared here by the CPs are worth sharing for it what made them who they are today. This section provides the reactions of the conversational partners after achieving success, their learnings from it, their insights as examinees, and their pieces of advice for the LET-takers. The major theme, Insights, is comprised of the sub-themes Success, Learnings, Answered Prayer, and Pieces of Advice.

Success

In the understanding of success experienced by the conversational partners, the core ideas, Destiny/luck, and Self-reaffirmation emerged.

The CPs formed the idea of Destiny/luck, for they had revealed that after finally achieving success, they felt that it was either because it was the time God had given them or simply because of their luck. This was significantly shown in the statements of CP03 and CP14 saying, Things like this. "Maybe it's all just luck.", I said."; "That time, I finally passed. I was so happy for so many years of failing. I said, "Maybe that was really the time God has given me. Maybe it was not just my time before. One explanation of why CPs think this way was because of the role of gender, as studied by Xia (2018), who revealed that women are less likely to take credit for their success and are more likely to attribute good luck to it. It should be noted that the majority of the CPs are female.

Moreover, as discussed previously, one of the reasons for the CPs' motivation is for them to achieve self-reaffirmation and thus showed in their responses. After experiencing failure many times, the CPs finally proved something to themselves. This phenomenon was in accord with the Self-Affirmation Theory of Steele. This theory proposes that people are concerned primarily with their global sense of self-worth as self-defense (as cited by Epton & Harris, 2008). This explains why the CPs felt self-reaffirmation after finally succeeding for them to regain self-worth as self-defense. Additionally, this could also be the end product of the Reactance Theory by Brehm (as cited by Fyans, 1980), suggesting that when an individual's behavioral freedom is threatened, one would be motivationally aroused in an attempt to restore his freedom.

Learnings

In the inquiry of the conversational partners' learnings through what they have been through creates the core ideas: Goal-driven and Take the examination seriously.

In relation to the Incremental Theory of Intelligence by Carol Dweck et al. (1988), it is indeed possible to improve intelligence and ability through effort and hard work as it is described as malleable. This theory explains why the CPs learned and proven that through having a goal and focus and taking the examination seriously, they overcame failure and achieved success. CP14 described how she gave importance to focusing during the review; I learned that we need to read, study, and allot the time for it in our review. In finding one's goal, CP02 shared, One should also be willing to study. A person should be driven by his own goal, and that goal for me was to pass the examination and get the license. Just dedicate the time and also pray. CP11 also accounts her experience in taking the examination seriously, unlike what she had done before, stating, During my first exam, we all just passively tried to have it. We were not serious about it; that's why we all failed. [Laugh] After knowing the results, I thought that I should take it seriously… I learned that to take it always seriously. It should not be just taken for granted. Additionally, having a goal supports the Goal Theory. It focuses on the reasons the students perceive for their successes and failures and the reasons or purposes students perceive for achieving (Ames, Maehr & Midgley; as cited by Anderman, & Midgley, 1998).

Answered Prayer

In exploring the experiences by the conversational partners on religious faith and prayers, the core idea, Faith in God, surfaced.

It is known that Filipinos lived the value of being maka-Diyos or being religious, as Clemente et al. held (as cited by Batara, 2015). This demonstrates why CPs had associated their faith in the Lord to most of their responses, especially when asked about their practices, learnings, insights, and pieces of advice. Association of faith can be read clearly in the statements of CP13 saying, Also, in striving hard, it should be coupled with prayer and trust in God. Also, CPs believing in the time God has given them when asked why they succeed proves that Filipinos' perception adheres to cultural ideals, including the notion that "it is in God's hands" (Dancel; as cited by Lagman et al., 2012).

Pieces of Advice

This section enumerates and discusses the **p**ieces of advice the conversational partners for the LET-takers. The core ideas: Give your best, Never give up, and Patience and perseverance appeared.

Give your best. The CPs stressed that in everything the LET-taker does, may it be during the preparation, review, study, and examination, they must take everything seriously. Striving hard and focusing on the task at hand is essential. They also mentioned that they repeatedly read the available learning materials, which is similar to the Law of Exercise by Thorndike (1932), which states that repeated practice strengthens memory retention. Additionally, the CPs also mentioned that having a positive mindset helped them in doing their best. As said by the CPs, everything from an individual's environment and mind should be filled with positivity. Since the CPs already experienced failure, they shared that one should not be discouraged and blame oneself if ever it would happen. Instead, failure should be seen in a positive light as a challenge for the LET-takers even to strive harder. This was in accordance with the tips enumerated by the Study International Staff (2018), which includes viewing failure as a challenge.

It is good to note that "Never give up" and "Never lose hope" are statements generally advised by the CPs. These, of course, directly relate to them as they had done it themselves. This relates to the Growth Mindset described by Doocey (2017), which includes a mantra of "nothing ventured, nothing gained," not accepting failure as the end. Furthermore, hope is defined as a ground for believing that something good may happen (Oxford Languages, 2020). The CPs advised the LET-takers never to lose hope, even saying that, as mentioned, Until there's a PRC, they are always allowed for an exam. This behavior was classified by Lakshmipradha (2019) as one of the fallouts of failure, which is the individual who pursues and never lost hope.

Patience and perseverance. This is another piece of advice by the CPs as they shared that waiting for the right time and the will to continue should always be embodied by the LET-takers as failure could come unexpectedly. This core idea supports the Law of Patience and Perseverance as written in Focus 3

(2020) article. It stated that patience and perseverance are necessary for achieving any goal. It takes time and effort to accomplish goals since it is just how the world works.

Functional Implications

The findings of this research inquiry provide a whole new window in understanding the journey of LET re-takers who have undergone failure. The conclusions of this study may provide additional social value to the community, especially to the examinees in defining the standard of achieving success.

The findings from the current study encompass the different social strata as it cohesively benefits and involves the self throughout the professional community of an individual. Based on the findings and generated themes from this study, the following are the implications:

It is important to note that different factors caused problems for the examinees even before the examination, which could affect performance. Even the internal factors like self-determination and perception had been proven to be a hindrance to truly show the examinees' maximum performance. With this, examinees should re-consider their perception to prepare and take the examination seriously, allotting enough time and effort.

The unforeseen advent of failure is possible. When this happens, the examinees should be ready. As revealed in the study, surrounding oneself with a positive environment proved beneficial for the examinees. Whereas encountering failure would cause a lot of harmful by-products, even including depression. It is manifested that family played a significant part in the examinees' overcoming it. This is especially true for that crucial one-month period immediately after the announcement of the results, for some of the examinees might tend to keep the heartaches to themselves. Thus, it is advised for the family always to be vigilant and ready to be the primary safety net of the examinees in the event of failure.

The examinees of this study have definitely experienced failure multiple times. This only proved that they became triumphant through perseverance and hard work, supporting the Achievement Goal Theory (Maehr & Zusho, 2009) and the Theory of Intelligence (Dweck et al., 1988), describing the mind as being malleable. This implied that as long as the examinee sees his purpose in achieving such a goal, he will continue and persevere. Similarly, as long as the examinee exerts enough effort and hard work, improvement will always contribute to greater achievement. This is also when the examinees' acquaintances and professional community could help in providing encouragement and learning materials.

It has already been a tradition that the community celebrates success after announcing the results. However, comfort and solace for those who failed are most critical as a follow-up. Understanding this provides the alma mater or the CHED a guide to having a program about encountering failure and its psychological effects. This is to prepare somehow the examinees and their families for a worst-case scenario or have a support program for those who already experienced failure to feel valued. Simply said, educational institutions should provide mental health and psychosocial support programs.

The researcher recognized that the study needs further investigation. For future researchers, this study will guide them in exploring the experiences of the examinees who failed in a board examination. The findings of this study may also be replicated but in a broader scope.

Insights

There are instances in life when we feel defeated, isolated, and think that the world is conspiring against us. However, as this research had proven, as long as you never give up, you will never be a failure.

As a researcher, I always felt sorry towards my friends and relatives who failed the board examination, but now I understood. Their fears, embarrassments, and self-doubts are all affecting them as a person, even to the point of changing how they see life. As heard from the conversational partners, I was really struck by their statements regarding the aftereffects of failure to them. It is also an eye-opener to know that some would rather keep the frustration and pain to themselves rather than sharing these with others. This made me realized that we should be more sensitive to people experiencing failure. They smile and say they are okay, but deep inside, they are not.

Though things may already seem difficult for these examinees, it is good to see that the family always gave them strength and purpose to continue and persevere despite misunderstandings and disappointments. I also noticed when asking about the motivations of the examinees, no matter they say that it is for money or work, it still all goes back to the family. It is really for the family why they need to pass the examination, why they need to work for a brighter future, and why they need money to help and provide their parents in return for their hard work and support.

I also found out that the CPs, especially those who failed multiple times and lost hope already, just need that one person to continue. They just need that one who would encourage them and believe in them again.

It is difficult, frustrating, and depressing for the examinees to experience failure repeatedly. They experience self-doubt where they questioned their intelligence, purpose, and even self-value; some would even see themselves as less valuable. However, the CPs proved that a person's value is not measured by their success but instead on how they achieve success. Through achieving success, they regain self-trust and self-affirmation – that they are still capable and that nothing is impossible through effort and hard work.

I want to end this research with a piece of advice to the examinees, through the compilation of responses of the CPs, all points to three valuable lessons in life. First, find the why's of your life. Second, treasure family and the people you consider family, for they will always be there for you. Lastly, you are never a failure until you stop. Never give up!

Acknowledgement

The researcher would like to extend his genuine gratitude to the people behind the success of this research. Without them, the researcher would never realize the study.

First and foremost, a heartfelt appreciation is extended to his family for extending their emotional and moral support. They guide the researcher throughout the conduct of the study and encourage him to continue and finish this endeavor.

Special appreciation is also extended to: Michelle T. Viña, Ed.D., the dean of the College of Graduate School, Evelyn A. Lopez, Ed.D., and Genevieve O. Torino, DBM, the research panel members for sharing their time and expertise;

Librado V. Lopez, Ed.D., the research adviser, for sharing his time, expertise, and untiringly extending his support, guidance, and supervision; and Nelisa S. Jorolan, Ph.D., the English critic and reader, for dedicating her time checking the grammar of the research;

Elmer V. Castro, Ph.D., the Schools District Supervisor of Midsayap South for the continued motivation by inspiring the researcher for a more remarkable professional development; the school principals of the Midsayap South District, and the researcher's workmates, friends, and relatives for their unending and genuine support;

The participants of the study, for responding and accepting the invitation to be part of the research and for sharing their experiences as data of the study;

Last but mostly, to our Dear Almighty God, the source of all strength and wisdom, for His unending guidance, love, and protection every day in our lives.

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Untold Stories of Elementary Teachers: Going Extra Mile to Inspire Pupils

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Abstract - Educators play various and complex roles that contribute to the development of a child. Their untiring support and efforts as well as their selfless acts in shaping their pupil's well-being is what makes a teacher exceptional. They continue to inspire their pupils despite the hardships they are facing. This study used qualitative approach and it is classified as narratology. It aims to unfold the inspirational stories of elementary teachers, in which their shared experiences helped their pupils to achieved learning. Six (6) elementary teachers who are under the Division of Pampanga, and received awards in the field of education, participated in the semi-structured interviews. Through the use of thematic analysis, findings revealed that inspiring teachers have distinct positive traits, inspiring practices, and principles. The findings highlighted the constructivist and humanistic approach. The inspirational stories of elementary teachers can be used in contributing to the professional development of teachers. These can also be adapted in their means of teaching. Majority of the teacher-participants prefer to work independently; it is recommended that they should engage more collaborative work with their colleagues for the purpose of gaining new insights about their methods and practices in helping their pupils to achieve success.

Keywords - Elementary teachers; Inspirational stories; Learning; Narratology; Professional development

Introduction

Teaching is considered as the noblest profession. Teachers mold the learner's life, thus enhancing their potentials. It creates a lifelong impact on the lives of every child. Educators influence pupils to take the right path and encourage them to become lifelong learners. In the 21st century education, the teacher's role shifted from dispensers of information into facilitators of learning. The role of the teacher is not only focused on the subject they teach but alson on being multi-specialists wherein they take the role of a guidance counselor, a nanny, a prompter, and a friend. Teachers' roles are vital to the academic achievement of all of the pupils they educate. Also, teachers play a dominant role in helping children who are facing academic, behavioral, and even financial challenges.

On the other hand, it is mandated by Republic Act No. 4670 also known as "The Magna Carta for Public School Teachers" where under section 13 of the law states that teachers should not exceed more than six hours of actual classroom teaching. Additional compensation of twenty-five percent should be given to the teacher if he/she rendered more than the required amount of time and not exceeding eight hours of service.

Contrary on the stated law, the required working time for the teachers is not being followed. Teachers still extend their time and effort thus bringing their paper works at home. According to the report of Bueza (2020), even though the salary of the teachers increased, it is still not enough for them. The teachers must play the role of becoming their pupil's second parent and provide assistance to the extent of helping them financially which is not mandated in RA 4670.

Even though they experience these challenges, the fulfillment of the teachers in seeing their pupils become successful in life is rewarding on their part. According to Eccles & Roeser (2011), teachers play an important role in establishing the learning environment and one of which is to create a setting that increases and maintains students' motivation and keeps them involved in learning. In a similar study, Johnson (2017) stated that the teacher's ability to enhance students' proficiency, interest in the given material, and sense of self-efficacy all influence motivation to learn.

Apart from the studies mentioned, it is stated in the Code of Ethics for Professional Teachers, 1997 under article III, section 1 that a teacher is a person who helps children learn and grow. Teachers must attempt to make learning more engaging and interactive so that students can learn and comprehend more effectively and they must be flexible because anything can happen in the classroom, at school, or even at home. Flexibility is a vital trait for any teacher (Code of Ethics, 1997).

As well as article VIII section 2 where it indicates that the teacher must prioritize the interest and welfare of learners and "shall handle each learner justly and impartially"; section 3 where the teacher should not be discriminatory against any learners; and lastly, section 9 where one of the duties of the teacher is to find out if his or her students understand the lesson that they are teaching. Teachers should be the one who makes a way to solve the learning gap (Code of Ethics, 1997).

Sammons et al. (2014) identified the characteristics of an inspiring teacher. The results showed teachers should possess enthusiasm for teaching and must have a positive relationship with pupils. Powell-Brown et al. (2014) added that the majority of inspirational teachers exhibit "softness" and "kindness" when interacting with their students. Developing and nurturing teacher-student relationships are crucial factors in influencing learners' lives (Cotnoir et. al, 2014).

The findings of Solpuk-Turhan et al. (2019) on the characteristics of an inspiring teacher are grouped into four areas: teacher communication, teacher behavior skills, class management, professional development, and assisting pupils in various ways. Self-evaluation and reflection of one's own performance are characteristics of exceptional teachers. They are able to commend themselves on their accomplishments and create objectives for improving the areas in which they wish to enhance. To keep improving and growing, they solicit feedback from their pupils, parents, coworkers, and administrators.

In the study of Strong et al. (2011), 25% of the teachers scored better on the intangible qualities of fairness and respect, as well as developing strong relationships with the pupils. Lamb (2013) also stated that an inspiring teachers are created, not born. Further, teacher educators play a critical role in assisting them in molding their behavior to meet the specific context of their profession.

As with the previous statements, teachers are genuinely enthusiastic about what they do and what they teach. They assist their students in discovering where their abilities and passions intersect, promoting a safe and exciting classroom climate and environment, establishing clear and positive classroom management, encouraging cooperation, and bringing innovation to the classroom (Qardaku, 2019).

Kunter et al. (2011) defined teacher's enthusiasm as an affective teacher orientation that includes the thrill, satisfaction, and pleasure associated with a school subject as well as the practice of teaching. It is also considered as the important characteristics of an inspiring teacher. Mahler et al. (2018) added that the knowledge and dedication of a teacher to inspire are the most important trait for a successful education.

Similarly, the report of Blaylock et al. (2016) stated that inspiring teaching ignites the imagination by combining intellectual challenge, high standards, and mutual trust between teacher and student to inspire the learner to embark on a journey of discovery with the teacher. Together with the previous sentence, an inspiring teacher is characterized as learning goal-oriented and has a vast array of teaching methods and strategies.

Along with the statement of Lin & Huang (2017), learners enjoy learning and listening if the teacher is effective. Derounian (2017) defined an inspiring teacher as an individual who motivates a learner to believe in oneself and presenting unique and new concepts to the learners. De Leon (2020) indicated that teachers must "have passion for excellent teaching" to ensure that learners are motivated to learn under their guidance and care.

Moreover, student motivation may be shown in a variety of ways. In the classroom, students who are self-perceptive, exhibit self-efficacy, are goal-oriented, and are autonomous are more likely to be motivated therefore, teachers should exhibit support, respect and sense of encouragement towards their pupils (Moreira et al., 2018). Additionally, students' learning is not solely determined by their own motivation. Teachers, through motivational support, play a critical role in inculcating students' learning (Johnson, 2017).

Motivated students engage in particular behaviors that boost academic achievement. They exert more effort in academic assignments, show resilience when faced with challenges, and persevere in dilemma (Lin-Siegler et al., 2016). As mentioned by Mart (2011), in order for the teacher to maintain the motivation and interest of students, positive reinforcement should be enforced. Jones (2016) added that motivation transforms goals into actions. A learner who is motivated will most likely work hard in achieving their goals and dreams. On the other hand, a learner who is less motivated has a high chance of progressing slowly towards achieving his/her goals.

The implications of inspiring teaching are typically mutually reinforcing: learners who have become interested in a subject put in extra effort to understand it; this extra effort provides a sense of progress, which boosts self-confidence. For other students, the self-confidence instilled by a teacher may serve as a springboard for interest and effort. Inspiring teaching can influence a learner's attitude about a subject, making it seem fun to learn, meaningful to their lives, and something they can excel at (Lamb & Wedell, 2013).

Furthermore, teachers should have high emotional quotient (EQ) when dealing with their pupils (Gamit, 2014). Empathy makes a significant contribution to education because of the positive effects it has on teaching and training activities in the classroom (Kutlu & Coskun, 2014). The findings of Arghode (2012) revealed that “empathy plays a role in instruction and empathy skills of the teacher is crucial” where pupils feel connected with their teacher by receiving support and encouragement from them.

Contrary to the previous researches, no one focused on the practices and principles of the elementary teachers towards the success of their pupils. Prior researches focused more on the motivation and characteristics of inspiring teachers. For this reason, the researchers decided to conduct the study in order to describe the inspirational stories of elementary teachers about encouraging their pupils towards success. In particular, the study aims to find out the positive traits, principles and practices that the elementary teachers applied in inspiring their pupils.

The researchers believe that this study would be beneficial to the teachers, pupils, school and future educators. There are assistance, initiatives, efforts, motivation and solutions provided by the elementary teachers behind the scenes inside the school that need to be discovered. On the learners’ part, the findings will motivate them to strive hard on their studies thus pursuing their goals and chosen careers. Next, this study would also benefit the school in adapting the approaches and traits the elementary teachers should possess in helping their pupils to succeed. Lastly, by addressing and describing the inspirational stories from elementary teachers, future educators would be encouraged and inspired on becoming effective elementary teachers in the near future.

To synthesize, being a teacher means enduring the hardships they experience and extending their support to their pupils inside and outside the school. It also means sacrificing their personal time in order to accomplish their tasks and school work. Moreover, a teacher often assists pupils in discovering their strengths and passions. In a nutshell, they assist their pupils in identifying their abilities (Furnham 2010). This means that the teacher acts as a guide and a mentor in order for the learners to complete their task and enhance their capabilities for them to succeed.

Theoretical Framework

This study is anchored on the Constructivism Learning Theory pioneered by psychologists John Dewey, Lev Vygotsky, and Jean Piaget. The theory is used as a basis in determining the traits, principles, and practices of elementary teachers in inspiring their pupils. According to Bada and Olusegun (2015), the theory suggests that “humans construct knowledge and meaning from their experiences”. Also, in a constructivist classroom, the teacher takes on the role of facilitator, coach, mediator, prompter, and adviser for the students in developing and assessing their knowledge which leads to learning. Moreover, in Vygotsky's "zone of proximal development", it highlighted the major difference between a child's understanding when working alone and reasoning when working with an expert (De Vera, 2020).

In addition, the study is also based on the Humanistic Learning Theory of Carl Rogers and Abraham Maslow. According to Hare (2019), Humanistic Learning Theory, also known as Humanism, is a learning theory that focuses on individual human abilities such as creativity, personal development, and choice. The role of the teacher is to assist and encourage the learners in establishing their learning. Teachers used a variety of learning methods to accomplish their objectives. This requires the instructor to be mindful of the students' individual needs and to be successful in assisting them in achieving the desired information. In addition, Samrat (2015) stated that in this theory, the teacher serves as a guide, companion, or support to the students. The teachers should not impose his or her own techniques or viewpoints on students; rather, they should serve as facilitators in this process. The researchers believed that these theories can help in rooting the study about the inspirational stories of elementary teachers in producing successful pupils.

The paradigm shows the influence of the two theories, which are Constructivism Theory and Humanistic Learning Theory, as elementary teachers aims for the success of their pupils. It shows how it affects the teachers in guiding, helping, and influencing their pupils' achievements both in life and career. The three boxes at the mid-bottom in Figure 1 are the factors to be determined in order to describe the inspirational stories of elementary teachers towards the success of their pupils.

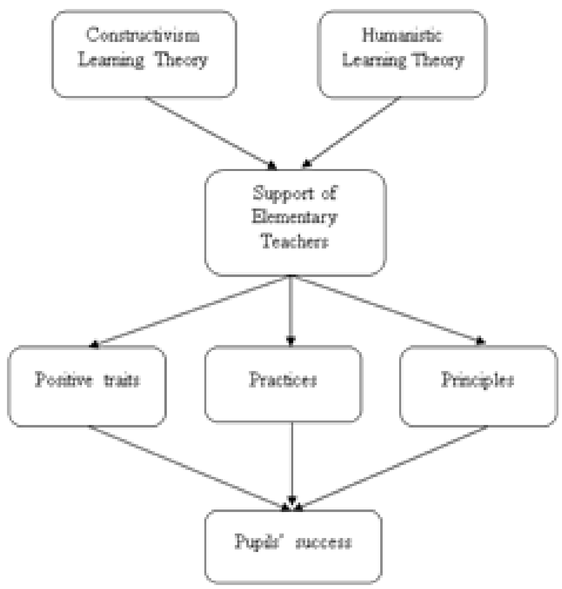

Figure 1. Research Paradigm

Statement of the Problem

The researchers aimed to unfold the inspirational stories of elementary teachers in producing successful pupils.

Specifically, it sought to answer the following questions:

1. What are the positive traits of elementary teachers to inspire pupils?
2. What are the perceived inspiring practices of elementary teachers in order to produce successful pupils?
3. What are the principles of elementary teachers in inspiring their pupils to achieve success?
4. How do elementary teachers apply their principles in inspiring pupils?

5. Based on the findings of the study, how do the inspirational stories of the elementary teachers contribute to the professional development of teachers?

Significance of the Study

The study was undertaken to identify how the elementary teachers go an extra mile to inspire pupils to achieve success. After the completion of the study, there are some potential benefits that can be gained. First, the teachers become more effective in imparting knowledge and skills to pupils and they can easily determine the strong and low points of learners that are important in their development. Second, for the pupils, the study will serve as their inspiration and motivation for them to become successful in achieving their goals. Third, it would be beneficial to schools because they may adapt the approaches and employ the traits from the participants to their teachers whose presence in the classroom would make it a more productive, appealing, and exciting environment for elementary pupils. Fourth, the study will help future educators in preparing themselves to become knowledgeable in their field of study and on how they can become an effective and inspiring teacher that might pave the way for a successful teaching career. Lastly, future researchers might find the results and other relevant information presented in this study useful in their efforts to conduct additional research.

Scope and Limitations

The study focused on unfolding the narratives of elementary teachers specifically on the positive traits, principles, and practices they applied in producing successful graduates. The participants of this study are only limited to (a) elementary teachers; (b) who have received awards in best or outstanding teacher; and (3) are teaching under the Division of Pampanga.

The study will not cover teachers teaching in the secondary or tertiary level since this study solely focused on the elementary teachers. The researchers believed that the role of elementary teachers are crucial for young learners since these children are at the beginning of their development. Moreover, elementary teachers are the foundation as they shape and mold them throughout the learners' primary years.

Methodology

Research Design. The researchers used a narratology research approach. It aims to interpret and provide in-depth meanings of the inspirational stories of elementary teachers in inspiring their pupils towards success. The study provided in-depth interviews with open-ended questions to collect data and information from the participants. According to Hays & Wood (2011), narratology aims to create a story about the lives of the participants. Narratological study is described in terms of story theory and a viewpoint from cultural psychology. Narratology is the study of the underlying dynamics of narrative, which is the form that a narrated story takes (Guillemette & Lévesque, 2019). Meister (2014) mentioned that narratology is a humanities discipline that focuses on the study of narrative representation's logic, principles, and practices. At its inception, structuralist techniques dominated narratology, which has since developed into a wide range of ideas, concepts, and analytic processes. In addition, it investigates literary works of language and gives a grasp of the elements that make up its fundamental structure (Ameriana & Jofi, 2015).

Sampling Technique. The study used purposive sampling. According to Crossman (2020), purposive sampling is a non-probability survey that is chosen based on population characteristics and the objectives of the study. It is often referred to as arbitrary, judgmental, or selective sampling. Robinson (2014) defined purposive sampling as the deliberate choice of informants based on their ability to explain a particular theme, idea, or phenomenon. Rather than beginning with a fixed sampling frame, purposive sampling requires an iterative method of selecting study subjects. The researchers believed that purposive sampling would be very useful in getting inspirational stories of an elementary teacher that serves as the main target of the study. Researchers employed this sampling strategy for eligible information. According to Glen (2015), researchers used a purposeful sample when they choose a sample based on their knowledge of the analysis and population.

Participants of the Study. The participants of the study are six (6) elementary teachers teaching in the Division of Pampanga that were utilized in the study because the saturation of responses were reached. Saunders et al. (2017) stated that saturation indicates that further data collection and/or analysis is unnecessary based on the data that has already been collected or processed. Additionally, data saturation occurs when no new information is discovered in data analysis, signaling to researchers that data collecting may be stopped. Saturation occurs when a researcher can reasonably expect comparable results from additional data gathering, which will serve to validate established themes and conclusions (Faulkner & Trotter, 2017). The participants are chosen based on the sample's intent. The researchers have set some restrictions as stated below. The participants satisfied the following criteria: (1) the participants are teachers under the Division of Pampanga; (2) the participants are elementary teachers; and (3) the participants have an award in the field of education, wherein selecting them, the researchers adapted the DepEd Memorandum no.002 s 2021 where the following criteria are stated: (1) the teachers must have a license for teaching (For elementary and secondary teachers, they must be LET passers, and for college, they must have Masters or Units of MA); (2) they must have at least five (5) years of teaching experiences; (3) must have an average performance rating of very satisfactory; and (4) they conducted a research.

The researchers believed that these criteria relate in producing successful pupils because as stated by Aliyyah et al. (2020), outstanding educators possess "professional, pedagogic, social, and personality competencies," which serve as the foundation for producing successful graduates. Outstanding teachers are enthusiastic about supporting pupils in their learning as well as about education. Outstanding teachers are insightful and thorough in their assessments of students' progress, and they base their teaching methods on evidence from high-quality research (Wyse & Rogers, 2017).

Setting of the Study. The research was conducted in Pampanga, Philippines. The participants of the study were six (6) elementary teachers who are teaching in selected schools under the Division of Pampanga and were given an award for in the field of education.

Research Instrument. The researchers used a semi-structured interview in gathering information of the participants. In qualitative research, semi-structured in-depth interviews are often used. This approach typically involves a conversation between the researcher and the participant, which is led by a comprehensive interview protocol and augmented with follow-up questions, probes, and remarks. The method allows the researchers to collect open-ended data, dig deeply into personal and often sensitive topics, and explore participant thoughts, feelings, and beliefs about a specific subject (DeJonckheere &Vaughn, 2019). The questionnaires were content validated by experts in the area of study. The participants were expected to respond and answer the series of questions from the interview guide.

Ethical Considerations. The proper guidelines were observed by the researchers. The researchers asked the principal's permissions of each school by providing them with the consent and letter that was approved by the Dean of College of Education and the University before administering the interview. To provide a further understanding of the study, the researchers provided a written description of the nature purpose or objectives of the study that was sent through Facebook Messenger to ask permission to those teachers to be interviewed. The researchers also highlighted that the information gathered was only used for the study and it was treated with confidentiality. For anonymity purposes, the researchers did not reveal the name and the identity of the participants in the data collection, analysis and reporting of the findings which is indicated in the data privacy letter that was given to the participant and signed it afterwards. Since there are COVID-19 safety measures to be followed, the researchers also conducted virtual interviews in which the links were sent strictly only between the interviewee and the interviewers. Lastly, the researchers also gave assurance to the participants that their information were secured and used solely to the study.

Data Collection. The researchers decided to conduct an interview in collecting data. The researchers prepared a letter and was approved by the Dean of College of Education and by the University. Upon approval, the researchers asked permission the principal of each school and began to contact the six (6) participants. The researchers sent them informed consents as it is important to the study to get consents from the participants. The form contains the purpose of the study, the information the researchers need, and the permission of the participants. The researchers also set an appointment from the participants for the schedule of the interviews. However, due to the COVID-19 restrictions, the researchers conducted a virtual interview or with the consent of the participants, personal interview was conducted. The researchers followed the protocol by wearing a face mask and face shield and social distancing. Moreover, during the data gathering, the researchers with the consent of the participants recorded the entire interview using voice recorder if the interview is face to face and google meet or zoom record if the interview is online. As the data collection came to an end, participants were once again reminded of the purpose of the study, and their freedom to withdraw their participation. The participants were also reminded that all information gathered through the interview remained confidential and not be used outside of the study. The data collected were transcribed after the interview and the researchers started to identify the themes and codes for the initial results of the study.

Data Analysis. Thematic analysis (TA) was used for this qualitative research study. According to Caulfield (2020) thematic analysis is a method of evaluating qualitative data. It is typically used to describe a group of texts, such as interview transcripts. The researcher analysed the data carefully in order to recognize recurring themes such as subjects, concepts, and patterns that come up frequently. Braun and Clarke (2012) defined thematic analysis as a tool for systematically defining, organizing, and providing insight into patterns of meaning (themes) across a dataset. Thematic analysis helps the researcher to see and make sense of collective or related meanings and experiences by concentrating on context through a dataset. Further, Braun and Clarke (2006) provided a six-phase step by step guide in using thematic analysis. First is familiarization of data. Read and re-read the transcribed audio-based data from the interview to familiarize and understand it, thus checking the transcripts back with the recording to check for accuracy. Second is generating initial codes. The data is then used to generate initial codes in this process. Coding is the process of highlighting text parts, typically phrases or sentences, and creating shorthand labels or "codes" to denote their content (Caulfield, 2020). Third is search for themes. This phase includes categorizing the various codes into possible themes and compiling all related coded data extracts within those themes. Fourth is reviewing the themes. The researchers review, change, and establish the preliminary themes defined in the previous step during this process (Maguire & Delahunt, 2017). Fifth is defining and naming the themes. Define and refine the topics that will be presented for analysis, as well as evaluate the data contained within them. The sixth and final phase is writing-up. The aim of a thematic analysis write-up is to convey the complicated story of your data in a way that convinces the reader of its merit and validity (Braun & Clarke, 2006).

Findings and Discussions

The purpose of this study is to unfold the inspirational stories of elementary teachers in producing successful pupils. Utilizing the narratological approach, the researchers were able to discover and identify on how elementary teachers inspire their pupils towards success. A variety of positive traits, practices, principles and its application were provided in this study for the readers to understand the stories from the participants.

Analyzing the data using Braun and Clarke (2006) thematic analysis, four themes emerged. These themes revealed the positive traits of elementary teachers, the perceived inspiring practices, their principles, and lastly, how they apply these principles in producing successful pupils.

1. Positive Traits of Elementary Teachers in Inspiring Pupils

Teachers are the role models of the learners. They are even considered as their second parent inside the classroom. The teachers are also the second most important factor that influence a learner’s growth and development next to the parents. The traits of the teachers must be taken into account because as stated by Ulug et al. (2011), the positive characteristics of a teacher significantly impacts a learner’s personality and life outcomes. In this theme, the positive traits of elementary teachers in producing successful pupils were identified in this study.

Based on the narratives of the participants, the researchers perceived the following characteristics that an inspiring teacher must possess; (1) Affectionate, (2) Approachable, (3) Compassionate, (4) Creative, (5) Fairness, (6) Flexibility, (7) Innovative, (8) Passionate, and (9) Truthfulness.

1.1 Affectionate

The teachers displayed their fondness towards their pupils and inspiring them to be a better person. "Warmth and affection are important aspects of a positive teacher-child relationship in early care and education settings for children's well-being" (Rani & Dhanda, 2018). Teachers' affectionate responses serve as a model of positive, kind behavior for children, resulting in more favorable child-to-child interactions (Anderson, 2012).

It was stated that teachers must treat their pupils as their own and must know the individual differences of their learners. The teachers must be sensitive to the feelings of the children because they have distinct behaviors, attitudes, skills, and capabilities. Moreover, the teacher must know their pupils individually: their voices, names, or their overall character to easily cater the needs of the learners that may lead to the success of the learners.

"As a teacher I can describe myself as a passionate and inspiring teacher. I always want to inspire my pupils to learn and become a good, not or rather not only good but a better person." – ET6

"As a teacher, your pupils are like your own children. Just like your own children, you know who is nice, who is naughty, who is smart, who needs help, is weak in class, has annoying behavior. However, you need to understand them because you are their mother in school." – ET1

"To the challenged pupils, make a way on how you can encourage them to learn more. Even if it is not class time, you are still thinking about them. Even if you are already at home, sometimes before you go to sleep, you think about what you did all day. You think of your students. Who are smart, who are weak and then you keep thinking about what I can do to help them?" – ET5

"Love your job even though the children are annoying. You'll always be looking for them now when it is not face to face. Their naughtiness, noisiness. In this pandemic today you should be free but no, you still monitor them. That is why I said, I always want to inspire my pupils to learn even if it's not face to face anymore, I should still monitor them." – ET6

1.2 Approachable

The participants indicated that being approachable will make the pupils comfortable around their teachers. According to the findings of Jasmi and Hin (2014), it was revealed that a friendly and approachable teacher increases the academic drive of a learner. The acquisition of learning of the pupils will be easier and faster once they feel that their teacher is easy to talk with. Unlike displaying a sense of firmness, it will make the pupils nervous thus, unable to express themselves. Additionally, by allowing the pupils to share and express their thoughts to their teacher, it may build the relationship and trust between the teacher and the learners. Being more approachable opens the line of communication in the classroom and it encourages the learners to participate and ask questions (Abouelnaga, 2019).

"I am still open on what they want to share in the classroom or what they want to share with me." – ET3

"I am not strict. I am not that kind of a person or a teacher who is strict to my pupils. Because once you become strict, your pupils might feel nervous and not at peace around you. But once they feel that you are easy to talk with, the learning is easier and faster inside the classroom." – ET4

1.3 Compassionate

A compassionate teacher shows concern and understanding towards her pupils. This strengthens the bond between the teacher and pupils. This can improve the learning environment and influence their learners in attaining success in all aspects of life. Alrubail (2015) stated that learners will be more open in understanding the world around them as a result from a compassionate teacher. The teachers express their compassion and affection towards their pupils by establishing strong bonds. They also reward their pupils in a small and special way and this leaves a mark to a pupil's life. The findings of Martin & Collie (2019) revealed that learners who have positive relationship with their teacher was linked to increased academic engagement in terms of involvement, enjoyment, and aspirations. School (2018) added that teachers who have strong classroom relationships with their pupils can help them attain higher levels of academic achievement. "Students who have close, positive, and supportive relationships with their teachers will attain higher levels of achievement than those students with more conflict in their relationships" (Rimm-Kaufman & Sandilos, 2010)

> "Motherly, even though I am strict. For example, if someone is having an LBM, he pooped. I shalll stop my discussion. I let my pupils bring an extra t-shirt. In some instances, when his tummy aches, it is a tendency that he wants to poop and because he is a child. What I do is, I will bathe him. Other teachers won't care, there are teachers like that. As for me, I will stop teaching. "Okay class, oh, get paper and pencil and write your name. Hurry up, I will bathe him first. After that, "Ma'am I didn't bring anything *pretended to cry like a child. "Who has extra shorts?" "Ma'am, I have shorts with underwear." "Remove the other one." Who has T-Shirt?" They are wearing polo. "Ma'am I have. He can have my polo and I will wear my sleeveless undershirt for the meantime. I will just change later" – ET1

> "I am caring. Don't touch or bother my pupils whatever grade you are in, we'll have a fight. They are my children. Inside the class, they're my children." - ET2

> "Being understanding is important. I let them know that I understand their status through submission of their project, I asked them to buy cheap materials only because I know that my learners in public school can`t afford expensive materials that much." – ET3

> "For example, he gave me food. I enforce the value of giving and sharing. And I said to him, "Tell your mom" "Ask her to buy two cupcakes and tell her one is for Madam," for example. Then, my room during recess, the top of my table is full of snacks. For example, chuckie, there's juice, and others. Then I will look at the kids who don't have any snacks. "Joed, did you give this to me?" for example. "Yes, ma'am." "Can I give this to Troy?" "Yes, ma'am," she says. "Okay, come, come, come here and give it to Troy." After that, there are children who are shy to eat it so I will help them and then hug them "You can eat that" and then the child will eat after that."– ET5

1.4 Creative

The teachers had to be creative in catching the attention of their pupils. A creative teacher brings more than just knowledge to pupils. They are also educated in other fields and can use their experiences in the class (Constantinides, 2015). They infuse different strategies to the learners in order to get them to participate in the class. These include (a) different playful claps, (b) incorporates arts and (c) incorporates singing. Moreover, introducing an alias to the pupils makes them remember their teacher and it can make the pupils comfortable around their teacher. Davis (2018) added that creativity also improves learning directly by raising inspiration, expanding knowledge, and promoting joy. Furthermore, these also provide amusement to the children which makes it easy for the teachers to attain the objectives of the learners.

> "Do you know in online when they answer? I have different claps. In face to face, what I will immediately do is, I introduced myself. "I'm your teacher. I'm ma'am *name of the participant. Then I tease the children" Who is your teacher?" "The fat one." and then I tease them again "No don't say that *using a sad tone I will get angry at you" "What should we say?" "Ma'am Sexy" "Ma'am

Sexy". "Who's your teacher?" "Ma'am Sexy". I'll teach him the beginning and I'll supply "Ma'am Sexy". Until now that I had pupils who are already an architect and a doctor, they greet me "Hello, Ma'am Sexy"" – ET1

"Just like I often say, incorporate arts. My love for arts. When they see me use my comics, when they see me use my story books which I made myself, my pupils are amazed. "Ma'am are you the one who made it?" like that" – ET5

"When you incorporate singing because I love singing, they are also amazed, which is where I get their attention. English is boring because they don't quite understand it." – ET6

1.5 Fair

The teachers must be fair in treating their pupils. They must not practice favoritism because it can affect the learners. According to Dumanjug & Bulat-ag (2017), showing favoritism to one of the children may have a negative impact on the other because they may lose respect for the instructor and begin to mistrust the teacher's ability to manage a class, making the teacher ineffective. They must establish a culture of respect, fairness and trust in their classroom because learners may hold that for their development. Students who are treated fairly in the classroom are more likely to appreciate and tolerate one another (Serin, 2017).

Moreover, teachers must treat their pupils equally because no children are alike and they have unique traits, behaviors and attitudes. They must be fair either in giving grades or their treatment towards their pupils. Fairness, also known as justice and objectivity, is often regarded as the most desirable quality in a teacher by students, instructors, and parents. It implies that a good teacher should treat all students equally, particularly when it comes to grading.

"Don't practice favoritism. When one child defecates, you wash him then put on powder. Then another kid defecates, don't tell him "Stop. I'm already tired of all of you". When you praise someone, praise the other one too." – ET1

"When you don`t take sides with your students, like that, when you don`t have a favorite. For example, he is intelligent that`s why he is your favourite. She is frisky and talkative that is why you hate her. I always make sure that I look at each of my students equally so that they will feel that they are all equal in our classroom." – ET3

"Treat them as unique individuals because no person is alike. For example, you should not practice favouritism. You should treat them equally. You have to be fair. That's what you should practice, especially if you're giving them a grade. Ah, in terms of their performance, you should be honest." – ET6

1.6 Flexible

The teachers must be flexible in the class since children have individual differences. The teachers must cater to these differences in order for them to achieve the objectives of the children. Working circumstances in the twenty-first century workplace are rapidly evolving. As a result, teachers must not only be resourceful, but also flexible and adaptable to changing conditions and environments, as well as open to new ideas and methods of completing work (Kivunja, 2015). Children also have different behaviors and as a teacher, there is a need to investigate the reasons behind these behaviors in order to enforce an approach in dealing with these pupils.

In addition, the teacher must come up with different activities because pupils have different cognitive abilities. There are children who display excellent performance in class and others who are the opposite, therefore, the teacher should cater these in order for the learners to succeed on their objectives in their own way. Flexible learning can improve student learning by providing new ways to structure material engagement, assessment strategy, and learner communities (Cassidy et al., 2016).

> "Because children have individual differences, as teachers, we are like artists. We should be flexible. You must learn the different characteristics of your pupils. Some of their behavior are special. First of all, take discipline as a way to get their attention. When you haven't got their attention, let them express themselves. What if the child is a troublemaker and goes wild? Know them, study them. Oh, why does he have to punch? Why does he have to fight? I will ask him "Oh son, why did you do that?" Why did you punch him?" Eventually, you will discover that in his home, his siblings are always fighting. Every year you should have a different teaching style. Even in teaching, it depends on the children. Last year, there was only one bully. In another year, it might be five. Next time, there will be ten pupils who will be able to listen to you. You should change your teaching style." – ET1

> "Just simply letting them be able to read, letting them be able to write is already a success so maybe, one thing that a teacher should possess is flexibility. Since not all children are the same so maybe for an A one class, you can give them challenging activities because they might get bored. But what about section B? What about those who are at the hem of your class? They also need to be successful in their own way so you will give them activities that are only for them. You as their teacher need to be flexible because if you are not flexible, at the end of the day you will feel very disappointed and frustrated because you may set expectations like this is how it should be, I will demand quality outputs for my students. But what if the children did not produce the quality output that you are expecting because it is not on their level and their performance is poor or weak. They have different levels of intelligence that is why you need to be flexible for the both of you to be happy at the end of the day." – ET5

In terms of work-related traits, the teacher must also be flexible on their job. They must be updated and flexible in learning new tools in teaching. The emergence of technology paved its way in education thus, all of the schools used technology as a tool in teaching and learning. Since technology is fluid, constantly changing and upgrading, teachers must be flexible and learn to navigate them in order to apply it in their work and in the teaching and learning process. According to Agrawal (2020), it is critical for educators to stay up to date with these changes in order to guarantee that children are equipped for an ever-changing world. Technology integration in the classroom can help students learn more effectively.

> "You are really flexible. The teacher? You have to be really flexible. Especially now, when technology is so difficult, especially for us older people. Using a computer? You know, we're having a hard time. Like me, I only know the basics and I can already make a report, but besides that, I still don't know everything. Because we are not used to technology. For example, you know it today (laughed), tomorrow and the next day, how is it again? *laughed. Unlike today were you children are very bright. You easily pick up things. It's hard, although it's difficult, we have to do our work. How can we make a report if we don't know how to use a laptop and a computer? You'll have a hard time if you do not know how to use it." – ET6

1.7 Innovative

According to Fehérvári et al. (2018), teachers are increasingly expected to update their practices on a daily basis and to share their newly acquired information or revitalized practice with their peers. The teachers had to innovate activities to make the learning fun and easy for the children. By thinking of alternatives, it can lessen the expenses of the children in making their project and activities that need to be achieved by the class. Teachers must be innovative in their class. Children have different behaviors as well as their performance in class, some are excellent and are poor. A teacher should think of ways in order to cater to all the pupils such as remedial class or providing more activities and materials that are suitable on the level of the children. Apart from this, teachers should think of ways in getting the attention of their pupils. It can be in the form of games, drills or other alternatives. Innovative teachers are always learning, always reflect on the outcomes and willing to try new things to respond to the needs of the learners (Berg, 2014).

> "I make a way for when we achieve-what we need to achieve in the classroom without having to spend a lot." – ET3

"I don't give them hard times in my learning discipline and I am thinking of many ways to make the learning became easy or become easy." – ET4

"You make gimmicks on how you get-catch their attention that's one way. Then they are also encouraged. For example, I used my comics and at the end you will see them tracing my comics, they copy it." – ET5

"There are children who are stubborn. When there are children who have been left behind in class, you have to make a way. Do a remediation, give ah more exercises, extra words in the lesson, more drills, more reading materials suited to the level of the pupils. Ah, for him to understand easily. If the child is having difficulty, you need to find a way for them to learn. Yes, you can create a lot of ways. In reading, it can be in a form of game like that, take the child's interest so that when you get his interest, he would have self-confidence that he could help himself." – ET6

1.8 Passionate

Teachers must have passion for teaching. They must treat both their job and pupils with love and care. They must be genuine towards teaching their pupils. Although, it was stated that there are times when a teacher must be firm in the implementation of the discipline towards a child to bend his ego, because there are learners who challenge the authority of their teachers. Once a child feels the genuineness of the teacher despite the firm discipline, the child will not be discouraged towards learning. As stated by Mart (2013), teachers that are passionate about their subject make a significant difference in student's lives. Students' achievement is influenced by passionate teachers. Moreover, children can feel the enjoyment of the teacher in teaching thus, making the class excited throughout the session. The teachers will do their best in helping their pupils achieve their goals. Teachers that are passionate about their work can have a good impact on student progress (Serin, 2017).

"Children also know when the teacher enjoys the class and then when they feel that the teacher enjoys what he is doing, children will become excited. That's your experience when you were under sir Niño right? You enjoy the class with sir Niño because you see him enjoying it." – ET3

"Another trait that you should have is genuine love because just like what I said, you cannot fake it. If you genuinely love your pupils, they will feel it even if you bombarded them with scolding all day or embarrassed them. There are times like that, whether you like it or not, although that's prohibited, sometimes it's the only way you get the attention of the child because he/she challenge your authority or maybe he/she has bad experience at home and is hot headed, he/she brings it at school, so you need to wake the child to the reality. So there will be times that you will embarrass them so that their ego will be bent. Even if you did those actions, if the child felt that you loved him/her, he/she would not be destroyed." – ET5

"Okay, always love what you are doing. Because once you love what you do, you will do your best for your pupils. Love your work that is very important, love your pupils. If you possess these three characteristics, no wonder you will achieve your aspirations." – ET6

"Of course, at first you will have a hard time, but if you continue, the children will make progress until they can become good readers. Your responsibility to the Lord God will make you bless. But, if you fail, don't lose hope. Now, if you are having a hard time getting them to learn, you still have to try your best. You should not get tired, don`t give up, and don`t complain. It is your job. Even if you complain, who will help you? Only you can help yourself *laughed." – ET6

1.9 Truthful

The teachers must be honest at all times. They must be themselves when they are teaching. It was stated that a teacher cannot inspire others once they pretend to be someone that they are not. Palmer (2017) stated that teachers who don't know themselves are not capable of knowing their pupils and the subject they teach. It all depends on knowing oneself. By being truthful, the teacher becomes whole and by becoming more real means acknowledging oneself. It was also mentioned that teachers must not pretend to be all-knowing and both teacher and learners are learning simultaneously. A child can feel when their teacher does not know what he teaches which makes the class session pointless. Teaching is the same as acting whether it will be on stage or inside the classroom. The personal lives of the teachers should be separated to the the role they assigned to play however, their true self surfaces in their every performance (Kriegel, 2016).

> "I tell them I don`t know everything but I`m willing to learn and study everything so that I can provide or teach them what they need to know." – ET2

> "For me, the best quality that a teacher should possess is being true to oneself, like we can't inspire others if we are pretending what we are not. Like, we should not pretend that we can do everything, that we know everything. Like what I've said, in the classroom uhm I let my students see that even though I am a teacher, I have weaknesses. I have some things that I still don`t know and continuously learning to make sure that I feed them right." – ET3

> "For me, the quality to inspire my students to become successful in life is "Acceptance". If you accept who you are, you are able to accept the reality in life. For example, you lack material things but are rich in other things." – ET4

> "Because you cannot pretend to be someone that you're not. Who you are is who you are. Not all sweet teachers are effective, not all sweet or soft spoken teachers are effective teachers because sometimes children find it boring. But the key is just being yourself. Children know where you're just running the session with them or the children also feel when a teacher doesn't know what he says." – ET5

2. Perceived inspiring practices of elementary teachers

In this theme, the participants revealed their inspiring practices in producing successful pupils. This theme has four (4) sub-themes. These include: (1) interaction with pupils; (2) teacher's practices in encouraging pupils; (3) teacher's way of helping pupils towards success; and (4) best Practices in inspiring pupils in the classroom. According to the findings of Kane et al. (2011), there is a link between student's growth and achievement to the practices of the teacher. OECD (2021) mentioned that the practices of the teacher are the core of their job and these play an important role in the learning of the pupils. The sub-themes mentioned above are the inspiring practices of the participants that they apply in their classroom that serves as a vehicle in producing successful pupils.

2.1 Interaction with pupils

In this sub-theme, the interactions of the teachers with their pupils were discussed. It covers here the ways on how the participants interact with their pupils to deliver teaching and learning in a very interactive manner. However, as the schools are currently closed due to the pandemic, the participants were asked about their interactions with their pupils (a) during face to face class and (b) during distance learning, to identify what are the adjustments they made in order to continue the interaction between the teacher and pupils.

2.1.1 During face-to-face classes

In this sub-theme, the teachers told their interactions with their pupils during the face-to-face modality. The practices that were perceived by the researchers were categorized into two (2), these are: (1) Accomplishing goals through discipline, and (2) Establishing an active learning environment. With these two (2) categories, the researchers easily identify how teachers interact during the face to face class.

2.1.1.1 Accomplishing goals through discipline

The participants noted that it is through discipline where they want their pupils to accomplish a specific goal. Discipline is required for effective school management and achievement of the school's objectives (Nakpodia, 2010). Based on the data of the participants, the teachers follow a procedure in helping the children accomplish their objectives. First, the teachers will set a meeting to the parents to discuss their program for the pupils. Second, the teachers will also set the rules and parents are given choices to let their children stay or transfer to another section. Parents' cooperation is needed to help the pupils attain their goals. Third, the teachers provided a specific time frame for the learners in accomplishing their objectives. Lastly, the pupils were given a thirty-minute lunch period and must strictly follow the instructions of the teacher. Teachers claimed that through discipline, the learners will become competitive. Ouma et al. (2013) believe that discipline is a fundamental component of human behavior and that without it, an organization will struggle to fulfill its objectives.

In addition, the participants establish classroom rules to teach students how to behave in an appropriate and safe manner in the classroom, hence boosting student learning. Classroom rules are referred to as broad expectations for all students in a particular classroom (Felix, 2011). If the students have no rules to follow, they will not learn how to behave appropriately in society. As early as possible, they should learn how to follow rules. Demirkasmoglu et al. (2011) stated that rules and regulations are essential since they benefit both people and communities.

> "I said "help me", I said help me teach the children, so that in June, I have a plan. I will set it to them."Okay, parents this is the plan. From June to September, your child can read Kapampangan and Tagalog; Help me!" I told them to support my program. "Second, November! Your child can read English. March! Your child already know how to read an encyclopedia. No crying to me! "As well as checking of assignments, Number one, I'll forgive you if you don't have an assignment. Two, I'll raise my eyebrows. Three, his notebook will fly. It's just that it's difficult, it hurts inside, and it's tiring. It's tiring even when their time for lunch is at eleven, they should finish their lunch by eleven thirty. I'll go out because the front of my room is the district, the principal and the supervisor are with me. So we stayed. I asked for permission: "Madam, can we stay here in front of your office?" We're not making a fuss because it has a cover. First, I will ask them to buy story books which cost ten pesos. I will tell them to buy ten pieces. The parents will spend one hundred pesos instantly. That's the initial step. When I say the instruction, just follow it. That's it. No more talking. Don't buy anymore, that's it, pencil, and paper, done! I told them that's the initial step, I develop their oral language. I do that constantly. I won't eat my lunch. Do you know what time I eat? Sometimes one thirty, sometimes two, two thirty pass the intended lunch time. Every day during face to face. I am really focused on reading because that is where I am challenged." – ET1

> "I'm a disciplinarian. I set rules. I'll meet the parents, I'll tell you my rules. And then, because I handle section A I am competitive. I'll push your children to do well. Don't make me angry, don't make me angry, I'm like this. I'll give you one hour to decide if you want to remove or transfer your child. If you're the kind of parent who spoils your children, go! You are free to leave, but if not, sure. I need your cooperation, it's for your child. So my discipline, from the start will last until they finish with me, and with flying colors. The children I teach are competitive. I really teach them, especially as a reading teacher, one of your achievement is for the child to read with

literacy and comprehension, and numeracy, all with proper discipline. I'll just raise my eyebrows, they already know it." – ET2

"Follow rules and regulations. It is a sin to me if you did not make your assignment. Because, if you will not teach him, when would it be? When he is in grade six? When he's twelve? As early as Grade one, follow the rules. When I say red, it is red. An apple is red, it's neither black nor violet. Listen when someone is talking. There should be eye to eye contact. When I am the teacher, you'll listen. Before I tell the story, I set the rules. When they are talking, I will say "What are you talking about? Is there a teacher there? Listen. When I already raised my eyebrows or I stopped talking, it means that there is something I don't like. I constantly practice it in the middle of the school year. When I catch you doing something else and you did not explain. When I raised my eyebrows and you did not say anything. It means that they are doing something that I don't like. That's it. Practice rules and regulations." – ET6

2.1.1.2 Establishing an active learning environment

The teachers indicated that establishing an active learning environment for their pupils ensure their success. This is through: (a) teacher's encouragement for the pupils to participate in the session actively; (b) through games and stories; (c) telling jokes to pupils to make the learning enjoyable and active; and (d) the application of technology such as using a Power Point presentation which makes the learners more interested to the lesson and the learning becomes easier. As indicated by Pundak et al. (2010), active learning improves children's comprehension more than traditional learning. Thaman (2013) added that in an active learning environment, both students and instructors have a greater desire to learn.

"It depends on the lesson or if it's not the time of the lesson, there's play, they play games. Sometimes I tell them stories because it's part of the lesson." – ET2

"Okay so during face to face class, I can say that our interaction within the class was interactive, you see the participation of the students, you encouraged them to participate even more in the lesson, in the discussion. That is, it seems that the *signal disrupted in our discussion is interactive. Unlike today, it's a bit difficult to be *signal disrupted interactive, what is *signal disrupted) – ET3

"During face to face, maybe I am a teacher who loves to throw jokes on my pupils. I am a jolly person why? Like I said a while ago, when your pupils are comfortable with you and are not afraid that the teacher's learnings will become easy, Pupils might feel that you are easy to approach. So as a student before I also experienced when my teachers are strict and fear precedes learning." – ET4

"The children, as of now, if you compare them to the old method, they enjoy the new method more. Sometimes, in a PowerPoint presentation, they can see in the monitor the actual lesson. It is moving, unlike before you have tangible materials. It's different today, its high-tech. Technology is being applied. It's more interesting, they like it more, they can easily learn. Of course, before it was different, today is more advanced." – ET6

2.1.2 During distance learning

In this sub-theme, the participants revealed their interactions between their pupils during the distance learning modality. The practices in the distance learning that were perceived by the researchers were categorized into two (2). These are: one (1) Supporting and fulfilling the needs of the learners, and two (2) Maintaining connections.

2.1.2.1 Supporting and fulfilling the needs of the learners

During the distance learning modality, the teachers have revealed that they had difficulty adjusting in the new learning setup. According to Kovacs (2017), teachers must acquire technological innovation in order to inspire further learning and as a mean to achieve better outcomes for schools, students, and society. Teachers must be quick to gain new skills and knowledge in order to give successful learning in the classroom today more than before (Darling-Hammond, 2015). They cannot effectively use their techniques in teaching therefore, the teachers had teaching innovation with the object of using technology to teach effectively in the distance learning modality.

The participants also revealed that their pupils are having difficulty in distance learning. The teachers traced their pupils to identify the root of the problem and it was revealed that the majority of the pupils do not have gadgets and access to the internet. The teachers set up a meeting with the parents to raise the concern and solve the problem. The teachers also shouldered the pupil's expenses in mobile data and Wi-Fi in order for them to reach their goal and to succeed. Children are unable to fully utilize the advantages that the internet provides. Support from teachers in regards to children's internet usage can help them develop their skills (Kalmus et al., 2012).

According to the Code of Ethics Article VIII, Section 9, the teacher is responsible for ensuring that suitable conditions exist for learners' maximal development, as well as providing needed support in preventing or resolving learner problems and challenges. Teachers also provide alternatives for pupils who could not join the online class such as printing supplementary activities and distributing it during the distribution of modules. These commendable actions from a teacher concludes that they are willing to go the extra mile in helping their pupils to succeed and reach their goals.

> "I have three T's in my life, in my teaching. Covid will stop me from being a reading teacher for all seasons? No. I have T's. The first T, ta te ti to tu T! First is time. Give time, don't make any excuses. For example, "they don't have this. Only ten of my pupils attended my online class. I don't like this anymore", no! Give time! The children God gave to me, He entrusted them to me so my conscience will haunt me if I won't teach them. Another T, talent. I explored my talent, facial expression, I danced, I can sing. This is talent, make a PowerPoint, screen shot, copy from the videos, and send a link. Treasure. It's always been treasure, even if you can inspire a little. Especially to the children with no food? I sponsor them just to be able to attend school. Now? Oh treasure. My children paid for the Wi-Fi, so I spent a little. So you should have a T, three T's with a heart because you know your heart." – ET1

> "So, from the central I traced them and I found out that they don't have gadget. They explained, "I was fired from my job, "I don't have the money to buy this and that" "Ma'am mine is just a keypad blah blah blah". As a teacher, I had to find a way. One, I held a meeting. I told the concern, who can help? *raised her hand "Ma'am I can help your student. I know someone, he already boarded a ship, and I will tell him about this, we will help *name". They will buy her a phone. And then "Ma'am, I have one" they gave it so I ask them to meet up. The problems are load, no Wi-Fi, no data. So I have three children, one is a teacher who is already a

principal, the other two *name and *name are both engineers. I ask them, "Son" "Yes ma?" "Can I ask for money?" "Of course, ma". They always give me. It was time of sleeping I ask them again "I want something from you" "What?" "What is his number? Globe isn't it? Globe isn't it? "Yes" "May you load it? Every week, register it already? "Yes!" The other one "yes ma" I'm so happy. Yes! From then on, until now, I have achieved my goal." – ET1

"So out of thirty, I studied modular. Oh mygosh, my technique? How? But, you know? Aside from letting them read, messenger became popular three or four years ago, messenger became popular. What I did is, I had teaching innovation, reading and multimedia teacher innovation in teaching reading." – ET2

"Not all of them have connection to the internet then the others don't have devices to use but, as a teacher it should not be a hindrance for you to communicate with your students. Supposed, I also work my way up. When they can't follow its either I will reprint the activity that I will discuss in our online class through google meet, I will distribute it during the day of the distribution of modules. For those who did not join our google meet, they can still do it." – ET3

2.1.2.2 Maintaining connections

Despite the challenges the teachers faced in the current learning modality, they still maintain their connections to their pupils. These are through: (a) providing feedback to the activities sent by the pupils. Feedback is regarded as an important tool for assisting students in their growth as independent learners who can monitor, analyze, and regulate their own learning (Ferguson, 2011); (b) constant reminders to the pupils and parents through 'online kumustahan' for those who have access and gadgets; and through distribution and retrieval of the modules for those parents who don't; and (c) providing consultations to both parents and pupils about the modules and activities. It allows teachers and students to maintain constant interaction outside of the traditional classroom, resulting in new teaching and learning environments through online sites (Ean & Lee, 2016).

"Then I will comment and send a personal message. Your dog is noisy. He is barking. The cluck of your chicken is louder. Then, there are late, it's already ten o'clock, "Why are you just making a video now? Did you play?" I said" – ET1

"Currently in this distance learning, we are modular. Interacting with the learners is quite a problem because not all parents have phones. Phones are the primary tools in distance learning. When giving important notes or reminders, they cannot cope up with it. For example, there are situations where we will remind, only a handful of parents have phones and can connect to our discussion. What we do is, only during the distribution and retrieval of the modules is the time where we can give reminders to those who doesn't have a phone." – ET3

"During distance learning "Online Kamustahan"is one of the best ways to connect with the learners. This is the time to ask the pupils on how they deal with the modules." – ET4

"I also monitor the pupils' progress and always tap the parent's support. "How are you? Send me your activities" then they will send. Video, I want video. I will send reading materials, then writing. Except for the modules, it's their extra work. As for the modules, "What part are you in the module? Where are you having a hard time?" Then parents, you can ask what part are you having a hard time teaching? Then you explain via messenger." – ET6

2.2 Teacher`s Practices in Encouraging Pupils

In this theme, the teachers revealed their practices in encouraging their pupils towards success. This sub-theme is categorized into four (4): (1) setting a role model, (2) success and learning is beyond numbers; (3) educating pupils about the value of education; and (4) applying extrinsic motivation. Khan (2012) stated that teacher's encouragement are important determinant of learner's academic success. In addition, based on the findings of Guéguen et al. (2015), 77% of the children who received encouragement from their teachers got higher scores on the task given to them whereas children who did not received encouragement, only 30% responded correctly.

2.2.1 Setting a role model

The teachers presented stories from people who had hardships in life and became successful. The teachers used the stories from themselves, parents of pupils, former graduates, and famous people as a means for pupils to idolize. Role models are those who, in general, give children a positive image and a goal to strive for (Haider et al., 2016). Furthermore, role models serves as an example to others thus influencing them to succeed through their perceived characteristics, behaviors, and achievements. They inspire others to strive hard without providing direct guidance and instruction (Krisbergh, 2015).

In addition, the teachers also stated the value of education to pupils by presenting the life of people who did not finish their studies and its consequences. These stories have the power to influence pupils' ideas and attitudes on life. Children may aspire to emulate the positive characteristics they perceive in their role models. Burgess et al. (2015) stated that role models have a significant impact on students' motivation and behavior. Teachers can show to pupil's successful people and personalities for the pupils to know why they are studying and to let them realize the importance of having a path in life.

Elementary teachers also indicated that projecting the person in their shoes will open their mind to study more, strive more and boost their performance in class to make their goal realized. One of the goals as a teacher is to help your pupils become the people they want to be and live the lives they want to live.

> "Let them tell, let them start telling stories about their doing at home. "Who is your idol?" then I will ask "why?" Then he would say, "Hay! My father is great, he is an engineer, and I intend to follow in his footsteps." I will answer "Oh, study hard for that, so that you will be an engineer too." So, from their own experiences, there are some parents who have not finished their studies, right? When you ask the child what the work of their parents is, they will answer "My father has no work " or "He is just a lottery agent". Don't say "My father is just a tricycle driver". I tell him "Oh, do you also want to be a tricycle driver? The child answered, "No, teacher". When I ask them why they want to become a doctor, they will just say "To cure the sick, teacher" or "because my mother is sick, teacher". They see their situation at home and bring it to school." – ET1

> "Those who did not study or attend school, what's their life now? What will be your future if you did not study well?" – ET2

> "I'll show them the reality. "If he can do it, though you have a better life than him, you can do much better. You need to excel, so that you're allowance won't go to waste". I challenge them like "He doesn't have any allowance, we just give him some but why can he do it?" After that, you will see the child doing effort." – ET2

> "I tell them the stories of people who persevered in life even if their situation was so difficult. For me, this is one of the ways to encourage children to be successful. You tell them stories of people who went through in a difficult situation but that situation did not become hindrance for them to reach or be successful in life. You also give an example that he can

> do this. If he can do this, you can do it too. You shouldn't say “I can't do it”. If she can do that, everyone can. You should not lose hope because you are having a hard time. Just because you experience hardships at first that is not an indication for you to give up.” – ET3

> “I will present a successful and powerful person or personality in our society. Why? This will serve as their main goal in life to become successful someday and to become one of them. Show to them who are the most powerful and popular people because as an elementary learner, idolizing is one of their stages in life. "My idol is him, my idol is Manny Pacquiao, my idol is this and that” so with that, when presented those successful people to them. Projecting the person in their shoes will open their mind to study more, strive more and boost their performance in class to make their goal realized.” – ET4

> “Did you hear the news about him? He is our graduate. Like that. For them to see like his life was just like this and like that but now he is successful. It’s effective.” – ET5

> “Giving them a good example. Ah make yourself as a good example like when I was studying, we’re just poor but I strive harder. Share story about yourself like I when I am studying, I experienced hardships until I study hard even if I don`t have enough money nor snacks I study harder. I worked hard even it was so difficult to study. I studied well, that is why I became a teacher. That is why all of you, must study well even if it is hard. When you have dreams in life, you will get what you want if you study well.” – ET6

2.2.2 Success and learning are beyond numbers

Teachers imparts to pupils that grades do not define their success and what they are capable of. The teachers inform their pupils that grades are not the basis of intelligence. Defining and assessing success are not just milestones in the process, it is a crucial discussion that impacts how education is perceived and provided (D`Entremont et al., 2020). The true definition of success and learning are being able to take on new challenges, to accept and learn from their mistakes that will push them to continue to grow and be responsible. According to Arum & Roksa (2011), grades and grade point average (GPA) are not necessarily reliable indicators of learning or cognitive development. It can be concluded that pupils can freely learn in their own way without having the pressure of having high grades from parents, teachers, and peers.

> “I also share with them the true definition of success. Success, that`s not when you graduated, that`s not when you got line of 9 grade, that`s not when you get a perfect score in this subject. I said, success for me, this is what you did, like when it inspired people. You have learned or became a good person while you still continue to achieve the things you want to happen in life.” – ET3

> “They are making the numbers as basis to your teaching but learning is beyond numbers, beyond the statistics of the score. You will find a very hardheaded child. A headache in the elementary and number one on teasing and then in high school, he was also number one in bullying but now, he is so responsible.” – ET5

2.2.3 Educating pupils about the value of education

Teachers educate their pupils about the importance of education in life. There are no barriers to learning when the children are persevering with their study. Ellis (2019) mentioned Nelson Mandela’s 1994 autobiography, where it stated that education is the most potent weapon which can be used to change the world. As stated by the teachers, education is a way to achieve success. A person who lacks education cannot succeed in life whereas those who have adequate education achieve success. Teachers also impart to their pupils that education cannot be stolen by anyone and a well-educated person cannot be easily deceived. Education is crucial to achieving a high standard of living. It is due to the fact that education plays an important role in the lives of people (Idris et al., 2012). Through these imparting words, pupils are encouraged to study hard to achieve success.

> “In this pandemic, I always tell them that this pandemic is not a reason for them to stop studying. Because I have pupils now who seem to be giving up because they are tired of answering their modules as well as their parents who seem to be saying that “Ma'am we can't do it anymore, we've given up” but I'm telling them it would be a waste of time if they stop, the class is nearly ending. I tell them that the pandemic is not a reason for us to stop learning, maybe uhm, maybe this pandemic is God's way for parents to give time to their children.” – ET3

> “You have to work hard to attain what is your goal in life. There are lots of trials and if you fail, don't stop, take them as an inspiration, stand up and focus on your goal.” – ET4

> “By letting them realize the importance of education. Education is important to be successful in life. It is important to be educated. If you do not study, you do not have a way to be a successful. Education is a big thing and it has been planted in you since then. Education cannot be stolen by anyone that is already in your place. When you are educated, no one can fool you.” – ET6

2.2.4 Applying extrinsic motivation

Teachers stated that giving praises and compliments creates an impact on the learners. It makes the learners become more confident in their craft and well-being because their efforts are appreciated by their teachers. Teachers must use feedback and praise as important teaching techniques in order to increase students' learning and establish a positive teacher-student relationship (AlGhamdi, 2017). It is through praises and compliments where pupils boost their self-confidence and self-esteem and put more effort on their studies and learning. According to Hensley et al. (2011), it is essential for educators and students to have a positive relationship, which may be fostered by using effective praise as a primary method for making classrooms more efficient and inspiring learning environments.

As mentioned by Kyewski & Krämer (2018), providing rewards can help students become more motivated. This will also boost their self-confidence and will not hesitate to participate in class. Duggal et al. (2021) added that receiving rewards, whether in the form of good grades, marks, or virtual gifts, motivates students. Extrinsic rewards are thought to be a powerful motivator that pupils appreciate.This indicates that since the teacher is the role model of the pupils, the words from the teacher creates a big impact to a learner.

> “They will do an assignment, they will video it, they will read, and I will send them the center materials. The parent is the one I will call, teacher mom. As an assignment. If you didn’t send a video, you did not follow my instructions. So before I sleep, oww good I will react to their messages, emoji, love. I'm praising them. For example "Very good". Introduce different kinds of claps. The first one is focus *demonstrated the clap, one, two, three clap, one, two, three clap then told him "very good". And then one clap, one two heart heart. One, two, three hearts. Praising them all the time. Either online or face to face, you need to praise. Even if the child did only a small thing, praise them. They feel better. "Wow ma'am told me I was very good. Even though some of the kids smell.”. “By morning, those who have a video, I will call them, I commend them for their everyday reading, those who don't have a video. By just looking at them, they will raise their hands "ma'am because my mom doesn't want to” *pretended to cry like her pupils "Ma'am I do not have a load"” – ET1

> “Just by simply saying "Good job! That's great! Excellent!” Yes, reinforcements. That's a great thing. To those children who are weak in class then you see him making a drawing, "Wow your drawing is so beautiful!" though for you the drawing is really not that beautiful, you saw that child exerting an effort, you will say it is beautiful.” – ET3

"I remember what ma'am *name said, though that child already stopped studying. I was so happy when he arrived, I think that was our Christmas party maybe that was his best outfit. He was very neat, for the first time he was very neat. I told him he was so handsome, I was elated. But did you know that I didn't know-I was happy that time, I said that he was so handsome, I was happy just like that. For me it's nothing but did you know? Until he went home, he repeatedly said what I told him, "Ma'am told me I am so handsome"." – ET5

"Very good! Good job! Study more! Keep up the good work!" for them to be inspired and strive even harder in their studies. They will have self-confidence. "I'm smart, I can do it". It boosts their hope to learn. Now in messenger when they send their activities, I react heart, thumbs up, my claps ``Very good" and then when other children see that, they will send and send their messages *laughed especially when our lesson last time was meter, centimeter, they measured their windows, they even went to the road. I myself am happy for the kids. At least, even if there is no face-to-face class, the pupils study. You are happy they do not neglect their studies." – ET6

2.3 Teacher's way of helping pupils towards success

Teachers help their pupils to carry the education and to make it easy for the pupils. In this sub-theme, the teachers describe their ways of helping their pupils towards success. Three (3) categories emerged; (1) Tapping the learner's potential, (2) Scaffolding, and (3) By giving responsibilities to pupils.

2.3.1 Tapping the learner's potential

Teachers claimed that every pupil has potential. It must be discovered, enhanced, and shown to everyone. Teachers let the pupils join different competitions and push the pupils to succeed through training. Students gain confidence in their potential and are empowered to perform better when teachers teach to their strengths, all while fostering a growth attitude (Waldman, 2019). Teachers insisted that it is good that the parents are aware of the class standing of their child so that the teacher will easily find a way on how to explore the potential of the pupils. Teachers are instruments for the pupils to achieve small wins that will serve a big factor in inspiring them to achieve success. Jackson & McDermott (2015) stated that when teachers recognize and focus on students' abilities, they create a good and effective learning environment. Students begin to feel in themselves as capable, important, and respected individuals, and they become more inspired to engage in and participate in school.

In addition, the teachers also believe in the potential of the learners. Lancaster (2020) stated that a teacher must believe in a learner's potential and push them to their limits which will encourage the learners to exert more effort. This will enable the learners to get out of their comfort zone which allows them to pursue success and are aware that the teacher will support them. According to the findings of Cohen and Garcia (2014), students who received extra sentences from the diagnostic feedback achieved higher levels. It is indicated that teachers must have faith in each of their pupils. A child may not seem to listen but the result from the assessment that a child is bright. Teachers indicated that the child has 'stock knowledge'. This may refer to the Constructivism Learning Theory of Jean Piaget where students gain knowledge by combining new information with what they already know (Olusegun, 2015). Additionally, despite the fact that not all children are born with the same level of intelligence, they all have the ability to learn. Teachers encourage pupils to learn by appreciating, supporting, and believing their capabilities.

"I will push them. Children are good to train because they are like an empty shell, put this and put that in them. After that, we joined. As I've said, I am competitive. Give them extra time, for example, in Sta. Cruz National, my former pupils there are gold medalists in PIWO award in math competition international. They came from me and I'm proud. So from grade one, they are winners in math until today. As for me, I clap my hands. So pushing them and after that explain it to the parents that their child is good at this, I will compete with him on this. Pushing them up to their exceptional talents. Be an instrument for them to become successful." – ET1

"By believing in learners' potential. To a child, you should have a trust in him. For example, you know that this child is weak, and then during your lesson, you will be surprised when he raised his hand to participate. Don't think "Why would I call him? He will just bluff". Children have what you call stock knowledge. Try to call him although there are those who really are naughty. When you call them they will just bluff. They will raise their hands and say "Ma'am I don't know it". In this case, add patience, but there are those pupils whom you know are weak and surprisingly, they know the answer. I had a pupil, I always caught him not listening in the discussion. He is not listening and then I will call him, I was surprised he knows the answer. Although he is frisky, he doesn't seem to listen, caught his attention. But in the evaluation, call him, he knows the answer. You will give a test, he will get a perfect score. I said to myself, what an odd kid. Then, when he became a grade three pupil, my feedback is also the feedback of the teacher in grade three. "He is really like that" I said to myself. We concluded that, there are children who seems to not studying their lesson, for example Polpol, he is like this and that, he doesn't study his lesson but he always get a passing score in his test. You wonder to yourself "Is he cheating?" *laughs. But no, there are children like that." – ET6

2.3.2 Scaffolding

Teachers scaffolds pupils in such a way they learn according to their capacity and interest. Breaking the lesson into pieces makes the teaching and learning in simplest way. It should be put in mind that learning is one at a time and it is not a one day process. According to Gallagher (2020), as students learn new skills, the teacher provides them with resources that build on their previous knowledge and experiences. The teacher monitors how well the students are doing on the prescribed skills or assignments and gradually removes the support. Teachers indicated that learners being able to make a small progress is already a success.

In Bruner's Scaffolding Theory, it was stated that scaffolding is a vital component of effective teaching, in which the adult adjusts the level of his or her support in response to the learner's performance level (Mcleod, 2019). Moreover, the teachers introduce activities with different levels of difficulty to the pupils. The teachers will provide activities where learners are interested and gradually give the pupils harder activities during the process.

"I will give all the necessary learning in classroom. The first adaptation of learning is at home, school is just a secondary home to them. As a teacher you will give all the possible learnings they need." – ET4

"Just like what I am saying, you don't need high grades, achievement. Being able to reach, step forward a little, that's already a success, the child is already happy." – ET5

"You need to give them activities that interests them and in their capacity that's it and then you give them-make them try a more difficult, something that they aren't interested for them to feel that they can do it because in life, you can't do what you only want to do or doing only easy task." – ET5

2.3.3 By giving responsibilities to pupils

Teachers give the pupils responsibilities in order to make them independent and responsible to themselves. It is a way of measuring how pupils take their task and how they make action towards this. According to Finn (2020), developing responsibility in children will help them realize their full potential because it entails making decisions, being trusted, and learning to accept responsibility for one's actions. Being responsible can make children feel important and enable them to contribute to the society.

If the pupils are assigned to do something, the teacher should distribute the task to the pupils wherein they are obligated to do and finish it. One of the participants said that by giving the pupils responsibilities, it makes the pupils' dedication towards work to be high. Responsibility can help students develop new abilities and gain confidence (Biddinger, 2016). If the pupil is not paying attention or not following the teacher, it is good that the teacher disciplines them by obliging them to do a task and take it as a big responsibility that the pupil needs to accomplish.

> "For example, the same as responsibility, outside right, you will see each child has parts, their assignment is to clean and beautify this and that. What's nice is the accountability, there is a leader-it needs to be organized, clean and all. So you need to develop the accountability for them to work themselves and need to have a better performance. That style became very effective because you will see the leaders, though their members can't come, because the accountability to their responsibility is there. You will see their part, they really clean it and all." – ET5

> "We already had a black sheep in the class, and it was difficult to handle them. Well, there are the bullies in the class, who are both hurtful and loud. Discipline them as much as you can because you as a teacher, do everything what you can do. Give him a task or an obligation every now and then. For example, do this, you are the leader of the boy scouts. Give him responsibility so that he himself realize his worth because sometimes children like them think they are being left behind, as if they are want more attention." – ET6
> 2.4 Best Practices in Inspiring Pupils in the Classroom
> All teachers have their best practice that serves as an inspiration to pupils. In this sub-theme, the teachers stated their best practices in inspiring their pupils in the classroom. The practices that were perceived by the researchers were categorized into three (3); (1) Provides moral support, (2) Creating a positive learning environment and (3) Striving Hard.

2.4.1 Provides moral support

The teachers provide moral support to the pupils based from the answers of the participants. It was shown by teachers through: (A) treating the learners with kindness and affection. Kindness is an activity that fosters positive interpersonal relationships (Layous et al., 2012). Having a kind teacher can make pupils feel welcomed, cared for, and loved. (B) It was also depicted that a teacher console the pupils by tapping them and saying kind words. When pupils experience high levels of understanding, care, and authenticity, they learn more and behave better. And, (C) the teacher's practice constant follow ups and reminders to the pupils about their studies. Reminding language encourages children to pause and visualize what they should do before responding on the expectation (Ziemba, 2018).

> "Treat anyone with kindness. Kindness. "Eat this" I'll kiss or hug them, even if my students stink. I told them to bring cologne and powder. At home, they are playing, and when I ask them "What are we going to do at school?" They answered, "We will study our lessons". Okay, let us study our lessons. My best practice is to tap them and say "It is okay, next time don't do that again. I am here, even you are sick, I am your teacher." – ET1

> "Constant follow up to the pupils. "Read at home" "Stay here for some time" "Let's study then you read at home". That's what I do every day. They have certain work that they need to study at home." – ET2

2.4.2 Creating a positive learning environment

The teachers create a positive learning environment for their pupils which is an important aspect in influencing pupil's learning. It is crucial for elementary pupils to be able to enjoy, commit mistakes, and learn from those mistakes during their time in school. In addition, making learning fun and engaging encourages pupils to actively participate in class. It also allows them to gain more value from the lesson and become inspired. According to Waldman (2016), in a positive learning environment, pupils feel safe and are able to engage and connect to the discussion which also contribute to their academic success. Wilson-Fleming & Wilson-Younger (2012) added that a positive learning environment helps the learners enhance, promote and encourage their learning.

> "Be always optimistic. It is important for elementary pupils to let them laugh, let them commit mistakes but make sure that they learn something from their mistakes. They made a mistake but they will make sure from that mistake, they have learned something." – ET3

> "One of my best practices in inspiring my pupils in the classroom is to create a positive learning environment. You will immediately realize that the relationship between the teacher and pupils is really important." – ET4

2.4.3 Striving hard

Teachers must challenge the pupils to strive hard and work for their goal. They must overcome their weakness to make them grow and improve. The characteristic of an inferiority complex, according to Adler (2013), is that people are continually attempting to find a circumstance in which they succeed. This motivation stems from their overpowering emotions of inferiority. Teachers let the pupils realize that if they want to succeed, they must be willing to pay attention to their goal and make extra efforts for it. Pupils learn from their mistakes also and it is a factor that makes them have the guts to set a room for improvement and strive more in order to become successful. Perseverance, according to Krisbergh (2018), is that a person will stick to a task even if he would rather do something else or if the work gets tough. It can be the difference between a child giving up and one who succeeds in achieving his goals.

> "I challenge them to overcome the weaknesses that they can't overcome because when they don't overcome it, they won't grow. It's like I'm telling them their flaws and their weaknesses so that they can grow & for them to make room for their improvement.)" – ET3

> "Make them realize and decide for themselves that if they want to become successful the must pay attention to their behavior and choices, and even sacrifices that led to their success. These behavior includes hard work, willingness to struggle, and ability to learn from their mistakes." – ET6

3. Principles of Elementary Teachers in inspiring the pupils

Principles are the unwritten rule and norms that the teachers must follow to assure the success of the teaching and learning process. According to the language of Gerard Manley Hopkins, "a principle is a rule for guiding the ship of education so that it will reach the port designated by the philosophy of education; it is a compass by which the path of education is directed." Principles are the most important guidelines for making teaching and learning more effective and successful (Samsujjaman, 2017). The principles of the inspring teachers that were perceived by the researchers are divided into four (4) sub-themes: (1) setting a map to reach the goal; (2) catering learner's individual differences; (3) leading pupils to become responsible, accountable, and good decision maker, and (4) preparing pupils for the reality of life.

3.1 Setting a map to reach the goal

Teachers must be a goal-setter in achieving the success of the pupils. They provide a path wherein pupils will follow. One of the participants insisted that a pupil will not achieve their goal instantly; they must work for it. If the pupil wants to reach a certain profession but the pupil does not put some action towards this goal, it will fail. It is critical for each child to have a goal in life since it will inspire them to do their best and achieve their maximum potential. As a result, when guiding pupils to fulfill their aspirations and support what they learn in school, a teacher plays an important role (Mbabazi, 2019).

Teachers make sure that every time that their pupils go to school, they should know what their reason is. Pupils must be aware of their goal. The teachers also set goals for themselves so that they know how to handle their pupils in inspiring them. Teachers set the map and apply different ways on how to make their pupils achieve success. They make such things like giving informative comments and suggestions to pupils that may lead to pupil's excellence. Based to Yeager et al. (2014), providing feedback is critical for learning and accomplishing objectives. Learners use feedback as a way to help them learn and improve and their teacher, which is the source of feedback, as reliable and trustworthy.

> “Each pupil should have their goals in life. As a teacher, I believed once you have your goals you strive more to achieve it. "Mercy is in God, man works for it" even if you always pray for it "Oh God help me to become a Doctor" then you're not doing anything do you think you'll become a good Doctor? That's what I always tell them. I always tell them that our generation has more advantages. There is an advantage especially for those people who finish their studies. In all what we are talking about here is the diploma of the pupils.” – ET1

> “Before they do anything, they have to make sure that every time they go to school, they know their goal or part of why they go to school, is it just because of allowance? Is it just to see their crush? To play? That kind of thing. That’s what I always told them before until now I tell them that they should know what they want, what is the reason for their study.” – ET3

> “I make sure that I learn every day. That is what I also advise to my pupils. I advise them also to try that and at least they have something to learn every day.” – ET4

> “By giving them informative comments or suggestions on their work performances that they will give them chance to excel and improve more on their studies.” – ET6

3.2 Catering learner's individual differences

Knowing the learners’ individual differences improves the social skills and academic confidence of the pupils. Teachers must provide different activities to make the learners creative and active in class. Howard Gardner’s Multiple Intelligence Theory states that people are born with different intelligence. It challenged the traditional notion that there is only one type of intelligence which only focuses on the cognitive aspect. The teacher practices different strategies in order to make sure that all of the students can relate to the lesson. The teacher should provide learning materials in a variety of ways, regardless of whatever subject is being taught, “the arts, the sciences, history, or math” (Gardner, 2013).

By simply knowing the learners individually, it will lessen the chance of having pupils who left behind. Teachers must put in their mind that not all pupils are the same. Teachers must employ different strategies in teaching and let the learner experience what they need to experience. Just like when they have group activities, teachers can make the leadership rotate so that all pupils will experience it. According to the results of Ma et al. (2016), in a rotating leadership, the relationship of the students are “decentralized” and most of the students are leading the group in different times. This practice helps to assure that all pupils have the chance to lead and stand for the group.

> “Each teachers have their own strategies. As they say, giving different activities makes pupils become creative. For example, the activities inside the room like group work. You will give a group work so the children themselves will solve the problem, for them to arrange the questions and they themselves will realize that what they do is right.” – ET4

> “Of course every quarter, the leadership rotates including the membership. They are not always grouped together. Whoever will be the leader of the weak child, poor reader, it’s his responsibility to improve that child.” – ET5

3.3 Leading pupils to become responsible, accountable, and good decision maker

Teachers must teach the pupils to employ accountability, responsibility, and good decision making. A child needs to learn how to be accountable in order to develop a sense of responsibility (Bantjes, 2019). Even now that they are in distance learning, the teacher must encourage the pupils to answer their modules on their own so that this learning modality will make sense. Teachers lead the pupils to the correct direction and let them grow accountable and responsible for everything. Students must learn to take responsibility for their activities, which is a crucial step in being self-disciplined and in order to succeed (Schroeder, 2015). McConnell (2014) added that by giving responsibilities to the pupils, they will gain more self-confidence in dealing with their academic obligations. Even at their young age, they must know how to make a good decision and they must be aware why they need to acquire all of these. The ability to make decisions offers children a sense of control and influence over their surroundings (Zoromski, 2021).

> "I tell them "why are you answering modules? Are you sure you're the one answering the modules? What is the reason you need to submit it to me?" I'm telling them that, the reason for answering those modules is for you can learn something, you will know something even if you're just at home. They should make sure that they are the one who answer because if they are not, modular learning in life seems useless. So that you will have a direction or for you to know where you are going." – ET3

> "They are getting direction, they know the reason why they persevere, why they keep studying. I tell them that they should also know the reason why they are studying because when they don't know the reason, they don't know what they are going to do unlike when they know and they really know what they want, there is the direction they are going and they know where they are going." – ET3

> "Despite their young age, they should really follow what their decision will be, thus, they should be also responsible for the decision they have chosen." – ET4

> "That style became very effective because you will see the leaders, though their members can't come, because the accountability to their responsibility is there. You will see their part, they really clean it and all." – ET5

3.4 Preparing pupils for the reality of life

Teachers prepare the pupils for the reality of life. Teachers do not limit the education and they teach without boundaries so that teachers bring to the learner the fact that in order to achieve their success they must be aware of what world awaits them. Children must be taught that there are numerous life problems to solve, as well as the intellectual and moral habits necessary to do so (Coghlan, 2019). Learners can cope up easily and showcase what are the things they have if the teacher lets them feel comfortable in a different environment. Elmore (2015) stated that allowing children to face reality helps them to develop resilience, strength, and confidence. In order to achieve success, the pupils must be aware of how to adjust with the changes. Learning does not end in the classroom, it takes place anywhere. Teachers facilitate the learning even beyond measures to make the pupils independent and prepare the pupils for real-life situations.

> "As I have said I help my students become successful by teaching them the things they need to know but also the realities of life.I make sure I teach them the lessons that they can apply in their lives. Like, they will learn how to deal with the problems they might face outside the classroom. Like, not only the lessons and subjects but also the life lessons that they can take when they grow up." – ET3

> "With these principles, every learner will strive and do their best to showcase their talent. They will inspire other learners to take one step forward and go beyond their limitations.

You are not just in your comfort zone, you need to explore so that you gain more knowledge that you can share with your pupils. Don't limit yourself, as well as your knowledge go beyond your box, go beyond your limitations, go to your boundaries to improve yourself as they grow and become mature enough to face the reality in life." – ET4

"In my class last year, there was one child though I won't mention his name because you know him, he is only in the barangay. The child has nervous or something, I do not know how I can classify him in psychology but the child has nervous to the point that he doesn't want to go to school and all. Others of course laughed at him because he cries, he is already in fifth grade and he is still crying like a baby and then because the class is kind, did you know? each of them-they are part and parcel to the overcoming of the child to his fear of attending the class and by and by because of-- at first, he has a favorite seat, seatmate and I let him. I membered him to that seatmate and when the next groupings came, he didn't want to be separated so I let him stay in the group. I changed the leadership and at last, he became the leader. And in the end, he is fiercer than his leader *laughs" – ET5

4. Application of Principles

Holding a principle in teaching makes the teacher knowledgeable in their work. In this theme, the participants stated how they apply their principles to their teaching and to their pupils. Based on the narratives of the participants, the researchers perceived the application of principles and these were divided into three (3) sub-themes: (1) open communication between teacher and pupils; (2) creating an active learning environment; and (3) utilizing the reward system as an initial step to attract pupil's attention.

4.1 Open communication between teacher and pupils

Teachers establish open communication between the pupils. This is to avoid misunderstandings and rivalry among the learners especially during an activity where rewards are provided. Every child wants to win therefore, as teachers, they must have an open communication between the learners and explain the nature of the activity to avoid unhealthy competitions to the learners. Instructors and students must communicate effectively in order to create a pleasant learning environment, which is sometimes hampered by teachers' failure to engage their pupils. As a result, pupils are compelled to exert undue effort in order to retain their concentration on the subject matter (Khan et al., 2018).

Agreeing to Alrashidi and Phan (2015), the effectiveness of a classroom's teaching and learning interaction is highly dependent on the teachers' ability to communicate or exchange ideas and information with their pupils. In addition, the teachers also provide timely feedback to the pupils. Teachers believe that providing positive feedback helps the pupils to gain self-confidence and self-worth which are the foundations for a child to achieve his goal. Furthermore, teachers should establish a common area of communication in the classroom as it has beneficial impact on the pupil's impression of school, their skills and their desire to achieve because a learning environment without good communication will make it difficult in the teaching and learning process (Rusu, 2021).

"Of course you need open communication. Sometimes, there is danger if there is no group rewards, sometimes there is rivalry in the class. I noticed that because everyone wants to win, to excel, to be the outstanding group so there is danger in that too. So you need open communication with each other." – ET5

"Providing timely feedback is very significant. I believe that positive feedback is one of the keys to developing a sense of confidence, self-worth and motivation among learners. Once a child develops self-confidence, he will trust himself. He will have self-worth, which is a very good foundation for a child." – ET6

4.2 Creating an active learning environment

Teachers create an active learning environment in the classroom. Constructivism is a theory in which students utilize existing knowledge to make sense of and understand present learning situations, inspired the notion of active learning (Schunk, 2012). The teachers allow the learners to have the freedom to express themselves and share their thoughts and ideas in the class for them to be inspired and do not have hesitations or doubts in expressing themselves. Moreover, teachers also facilitate peer to peer learning in the classroom and an active teacher-student interaction as a way to gain knowledge from exchanging of ideas. Northwestern University (2016) defined that active learning environments are collaborative learning spaces that stimulate peer teaching and student collaboration.

In addition, learning must be fun and enjoyable. It is one factor in getting the interest of the pupils. In teaching and learning, teachers should not let the pupils build fear. Fun and enjoyment are considered as a natural and fundamental aspect of children's learning (Lucardie, 2014). Teachers must remove the pressure on the part of the learners and let them enjoy everything. If the learners are forced to learn because they are afraid, they will not be inspired to succeed. When the learning is fun, the motivation of the pupils to learn is high. Based on the findings of Hernik & Jaworska (2018), fun in learning and joyful lectures results in students easily remembering more information. This proves that serious and rigorous teaching styles are the impediments in learning.

> "I can say that I can do this every Edukasyon sa Pagpapakatao (Values Education) time. This is the time that we have a sharing activity. These are our activities where I can share my experiences and at the same time the children can also share what they want and what they have experiencing." – ET3

> "There are different principles in elementary teaching. For me, what I did is the "Active Learning environment". Why active? Because if it's an active learning environment, it will always cater the learners. Their knowledge that they have is commendable. They can solve certain situations by themselves. Gaining knowledge from peers is also important. It's not purely learning in an active learning environment. It's the conversation between pupils to pupils, conversation between the teacher and the pupils and it's because learning is there." – ET4

> "I don't believe in children learning through fear. It should not be the drive for them to perform better out of fear. It's not needed, they should enjoy things. Maybe later, they will do things out of fear, they might hate excelling because it's a burden to their lives. Everything should just be enjoyed, to every thing and then by and by you will succeed in your own phase right? In your own way." – ET5

> "Create a learning environment that has freedom for them, freedom for them to speak, freedom for them to express so that will be inspired to speak and express themselves." – ET6

4.3 Utilizing the reward system as an initial step to attract pupil's attention

Teachers use rewards to get the attention of their pupils. Though the usage of extrinsic motivation is discouraged by some, it is a good strategy in catching the attention of the pupils. It is an initial step to get the learners to participate in the class actively. Reward systems are an excellent approach to recognize and reward student accomplishment and good behavior. Extrinsic motivation is a sort of motivation driven by extrinsic incentives or a predetermined end. It is important to use extrinsic reward properly, especially when pupils are asked to complete tasks that aren't particularly interesting for them (Damiani et al., 2018). It is helpful to understand that these incentive systems must be consistent and fair in order to inspire and encourage pupils (Mansor et. al., 2012).

However, giving rewards should not become a habit as Hussain (2020) stated that at most, extrinsic motivation has only 'short-term benefits.' Extrinsically-driven learners may put forth minimal effort to complete a task and may quit doing so when reward is no longer available. Once the pupils display active participation and striving for best performance, little by little, the teacher will remove the rewards. This is to apply to the pupils that learning should be enjoyed and not an exchange for a reward.

> "The fun of games is team and teamwork. With my own money, I'll buy them candies. So, I will ask them, "Who wants candy?" I will give them, even cash. For example, when we have an exam, I will say "Okay whoever got 100 over 100, I'll give him an award" An award that they got surprised. Every quarter, I buy medals at my own expense. I make certificates too. For those who did not receive a medal or certificate, I told them next time, they can do it too. That's it. Every quarter, I buy medals, then I see their parents posting on Facebook for being proud of the achievement of their children. Their relatives are also proud." – ET1

> "Also by giving rewards. Though others discourage the extrinsic motivation that they call but they are good. Because you will use this as an initial to fish the child to motivate, to excite the child for the activity. To the older kids it can be point system, to the younger kids it can be the things like- then by and by, by and by once they developed, like strive for the better and for best performance, little by little you will remove that extrinsic and they will be all by themselves." – ET5

Synthesis of Interpretation

Teachers play significant roles in touching the hearts of the children and making a difference. They shape the child's personality and attitude towards education and make them feel special. In the eye of a child, they are their greatest hero, their role model, and their second parent. Despite their busy schedules and mountainous paperworks, they are still able to smile in front of their pupils and inspire these children to succeed. Without a doubt, teachers are hailed as great actors and actresses. They think of the welfare of their pupils and seeing them succeed in their endeavours in life, as mentioned by the participants, is a milestone for a teacher. Indeed, as reflected by these findings, teachers hold both great roles and responsibilities in building up a child.

In fact, the findings indicated that elementary teachers indeed go an extra mile in inspiring their pupils to success. Along with their positive traits, the teachers' passion for teaching and inspiring their pupils are evident in the perceived inspiring practices. The findings suggest that teachers exhibiting these practices to their pupils are commendable because some of the findings are outside the mandated law Republic Act 4670 also known as "The Magna Carta for Public School Teachers" where it was stated that teachers must render services not exceedingly more than six hours. The findings also revealed that teachers render more than the required amount of time thus bringing their work at home. Although many teachers can relate to the previous statement, the findings also revealed that in the current learning modality, teachers support and fulfill the needs of the learners by sponsoring their pupils for them to continue their studies. The researchers saw the selfless acts of the teachers from their inspirational stories and are undeniably commendable as some of the findings are outside the job description of a teacher. Apart from the practices of elementary teachers, their principles were also revealed as Samsujjaman (2017) mentioned in his study the language of Gerard Manley Hopkins, an English poet and a Jesuit priest famous for his poems in the Victorian era, where it is stated that these principles are the compass of the teachers that shows them where the path of education is directed. The principles of the elementary teachers act as a guide for them to inspire their pupils. open communication as these can make the teaching and learning process become more effective and more efficient.

Moreover, the major findings from the practices and principles of the elementary teachers drawn from the study can be connected to Constructivism Learning Theory which was pioneered by John Dewey, Jean Piaget and Lev Vygotsky. In this theory, pupils create their own knowledge and reflect from their experiences which serves as their path to success rather than passively listening to the teacher. For learning to occur, the role of the teacher is to facilitate and guide the learners through asking questions and this can be drawn from the first principle that was perceived which is the setting a map to reach the goal. The teachers always remind the pupils about their objectives through questions. The teachers also established and created an active and positive learning environment where pupils are allowed to express themselves, exchange ideas with their peers, and the integration of technology in the teaching and learning process. In addition, the teachers also prepare the pupils for the reality of life by encouraging them to strive hard for them to overcome their weaknesses and through rotating leadership where all pupils have the chance to lead and are given responsibility and accountability. These findings are drawn from the experiential learning of John Dewey in which learners construct their knowledge from their experiences.

Following the first theory, the Humanistic Learning Theory of Carl Rogers and Abraham Maslow also known as Humanism focuses on the individual abilities of the learners. The findings connect to this theory as it was revealed that teachers cater to the individual differences of their pupils by providing them with differential activities and tapping their potential. The theory also states that learners will produce better outcomes once their needs are met and the findings showed that teachers provide the needs of their learners through moral and financial support. The teachers scaffold their pupils by helping the pupils to begin from smaller steps, providing activities with different levels of difficulties, and utilizing a reward system as an initial step to fish the children. Also, the teachers provide responsibility to the learners as these are the foundations for a child to have self-discipline, self-autonomy, and to succeed.

On the other hand, while previous research has focused on the roles (Eccles & Roeser, 2011; Lamb, 2013) and characteristics of an inspiring teacher (Powell-Brown et al, 2014; Sammons et al, 2014; Blaylock et al, 2016; Derounian, 2017; Mahler et al. 2018; Moreira et al, 2018; Solpuk-Turhan et al, 2019; De Leon, 2020), these findings unfolded the practices, principles and its application including the positive traits from the inspirational stories of elementary teachers.

Furthermore, these findings contribute to the professional development of teachers as they can be adapted. The teachers can utilize the constructivist approach where they can add to their prior knowledge and their pedagogy the findings from this study. According to Darling-Hammond et al., (2017) professional development is a well-structured career growth that leads to changes in teacher practices and “improvements in student learning outcomes”. “Professional development activities can come in the form of workshops, local and national conferences, college courses, special institutes, and so on” (Desimone, 2011). Mizell (2010) stated that the purpose of professional development is to improve the learning of both teachers and students.

Although the findings are derived from the inspirational stories of teachers, people rely on formal education, apprenticeships or mentoring, training programs, and self-study to master such concrete types of knowledge. However, Katuščáková & Katuščák (2013) argued that if well-crafted, stories can be used for inspiration, persuasion, communication, interpretation, and teaching, as well as transferring tacit information and visualizing the invisible. Mizell (2010) added that professional development can also take place in less formal settings, such as conversations among coworkers, individual reading and study, observations of a colleague's work, or other peer-to-peer learning.

Additionally, the teachers are required to have a continuing professional development throughout their lives. It does not end by graduating from college and getting a license. Teachers must not stagnate their pedagogy as the society is ever changing. One must be constantly updated in order to effectively teach the learners. As for the practices of the elementary teachers, the findings from this study can be added to their current practices in inspiring their pupils. These practices, as it was mentioned, are effective in the teaching and learning process. By adding these practices, the teachers can improve their instruction which is a requirement for professional development.

Apart from this, the principles and the ways in applying these principles can also contribute to the professional development of the teachers. As stated, the principles of the teachers are the unwritten law which guides the teacher to develop their practices. These can also be added and adapted to the existing principles of the teacher because the findings suggest that these are the foundations for the success of the child and are efficient and effective to the teaching and learning process.

Teachers are the building blocks of society. They link the goals of the learners to the vision and mission of the school and the nation. According to the philosophy of Reconstructionism of Theodore Brameld, “teachers act as agents of change and reforms" (Bilbao et al., 2020). They know the true essence of their profession and foster good attitudes. One must be passionate and dedicated in pursuing this career and must be committed before taking the oath of being a teacher. The teachers in this study showed that they are affectionate as the feelings of their learners are delicate. They are also innovative and creative as they want their pupils to be active. They display truthfulness and fairness because they want to establish a culture of respect and success. These teachers employ different practices for the learners to be able to succeed in their aspirations. They are also keen in making the learning environment fun and provides the freedom for the children to express themselves. They continue to exhibit a sense of excellence in their teaching, genuinely love their pupils and their enjoyment for their job is evident. They show resilience despite the stressful and endless workload that they have just to engage with their pupils and continue to inspire them. More importantly, relating to the current situation, they also showed that the pandemic will never stop them as they continue to provide support for their pupils either morally or financially and enforces the learners about the value of education. Teachers nurture the minds of the learners and mold them into something great. The teachers from this study stated that teacher’s greatest achievement is not the awards they received nor their medals but something that is intangible and that is seeing their pupils succeed in their aspirations in life. Their selfless act and genuine love really proves that teaching is the noblest profession.

Conclusion and Recommendations

Conclusion

As teachers play an important role in the society where they give children the purpose and lead them to achieve their objectives in life, it is important to understand how they are able to inspire their pupils. By unfolding the inspirational stories of elementary teachers in producing successful pupils using the narratological approach, this study was able to perceive the positive traits, practices, principles, and application of the principles in inspiring the learners. From the findings of the study, it was found out that elementary teachers apply the constructivist and humanistic approach in their teaching. This is through allowing the learners to play an active role in the classroom and accommodating their individual differences. They also foster good attitudes and build positive relationships through open communication with their pupils because these are fundamental in forming trust and active engagement in learning. Moreover, teachers possessing the traits that were perceived are effective in inspiring the pupils which also makes a lasting impression from them. Furthermore, since teachers need to constantly improve their pedagogy by gaining additional knowledge and skills, which is a requirement for their professional development, the findings from the present study can be added and adopted to their instruction. Likewise, the findings from the positive traits, practices, principles, and application of the principles from the inspirational stories of the elementary teachers suggest that these are determining factors in inspiring pupils towards success.

Recommendations

Based on the findings of the study, the following recommendations are suggested by the researchers:

a. Teachers might engage in more collaborative work with their colleagues and peers because such ways allow them to learn relevant knowledge, information and exchange insights about themselves and their practices.
b. Teachers could reflect more on their qualities and teaching to identify the barriers and apply new methods in their instruction. This may help them improve their pedagogy which contributes to student’s attainment of their goals.
c. Administrators might offer additional seminars/webinars/workshops for the betterment of their teacher’s personal and professional development since schools play an important role in improving the quality of teaching of their teachers.
d. Future research is recommended to yield more inspiring stories during distance learning.

Acknowledgement

The completion of this study could not have been possible without the participation and assistance of the people whose names may not all be enumerated. Their contributions are sincerely appreciatedand gratefully acknowledged. In particular, the researchers would like to express their sincerest gratitude to the following:

- Dr. Riza B. Lintag, Dean, College of Education, for allowing the researchers to carry out this work;
- Dr. Catherine G. Danganan, thesis adviser, for her continuous guidance, support, advices, countless efforts and invaluable suggestions throughout the research. The researchers are deeply grateful;
- Dr. Jenelyn T. Pena and Dr. Adonis A. David, panel members, for their valuable comments and suggestions to improve the study;
- Dr. Arnelia B. Mandap, Dr. Grace A. Mendoza, and Mr. Julius Ceazar G. Tolentino, for their kind assistance and suggestions in validating the questionnaire;
- Dr. Jerame N. Gamboa, for giving time and effort in correcting the grammar of the study;
- The participants of the study who have willingly shared their precious time during the process of data gathering;
- The families and loved ones of the researchers, for their unending financial, emotional, and moral support and encouragement and constant trust; and
- Most of all, our Almighty God, for the gift of life, resilience, and patience, who made this undertaking possible, attainable, and successful.

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MOODLE Effectiveness, Digital Literacy and Academic Performance: A Groundwork for Virtual Pedagogical Guidelines

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Abstract - The pandemic triggered countries across the globe to shift to educational paradigms that are innovative for continuity. As a result, education has changed dramatically with the distinctive and drastic rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Various Learning Management Systems, such as Schoology, BlackBoard, Canvas and Moodle became available. Because of these sudden changes in the way education is being conducted, Moodle has been introduced in the research locale as a new teaching platform to transition both students and teachers in the conduct of flexible learning to adapt into the new normal. The purpose of the study is to describe the sociodemographic profile of the respondents which served as variables to test for difference in Moodle effectiveness. Primarily, it explored Moodle effectiveness, digital literacy index and academic performance of students at a locally public - funded University in Manila. Relationships between Moodle effectiveness, digital literacy and academic performance were determined utilizing descriptive-correlational design. Stratified simple random quota sampling technique was applied in selecting the one thousand thirty-five (1035) respondents. Data were collected using a researcher-made Likert-type questionnaires and were analyzed using both descriptive and inferential statistics. The demographic characteristics of the respondents depicted a predominantly female sample with more than half emanating from the third-year level with ages ranging from nineteen to twenty-one years old, mostly affiliated under the College of Teacher Education. Smart phones surfaced to be the most utilized gadget while mobile data is reported as the prime connectivity mode. Highest screen time engagement is five hours or more and mainly spent during daytime. The gross family income accounted ranged from fifteen thousand pesos and below for the majority. Moodle as instructional delivery platform was evaluated as highly effective across the five dimensions, with results of digital literacy index also noted to be high and a very satisfactory academic performance based on GWA. Interestingly, there is a significant difference on digital literacy index when grouped according to year level, screen time and family income. Inferential calculations indicated a positive moderate correlation between Moodle effectiveness and digital literacy index as supported by an r- value of 0.535 (p-value of 0.000) while digital literacy index and academic performance have a weak positive correlation with an r-value of 1.101 (p-value of 0.001). Moodle effectiveness and academic performance, however, did not show a significant relationship (r= -0.030). Digital pedagogical guidelines were crafted to address the gaps in the findings. The guidelines comprise of an umbrella encompassing both areas of Moodle and digital literacy known as REVAMP, which stands for Remodeling and Enhancement of Virtual Academics through Moodle Platform. It is suggested that future studies require in-depth exploration of variables that may impact Moodle effectiveness and digital literacy in the areas of student learning preferences and interests; teacher and student satisfaction level as well as evaluation modes of LMS -based learning. Limitations include the possibility of bias as results were extracted from self-report surveys with a sizable number of studies on limited context, location and groups. While Moodle does offer a full range of options in implementing innovative online teaching and learning strategies, it should be viewed as a complimentary tool to leverage student learning outcomes in the new normal. The results recommend collaborative efforts of academia, policy makers and IT programmers towards a sustainable Moodle use in the conduct of flexible learning.

Keywords - LMS, Moodle Effectiveness, Digital Literacy, Academic Performance, REVAMP

Introduction

The widespread change in technology around the world, combined with the Covid-19 challenges, resulted in a major overhaul of various aspects. The educational system is one of the most affected sectors. Because education is now homogenized with online classes, this change focuses not only on how curriculum will be implemented, but also on the pedagogical approach. However, this innovation raises the question of whether or not this change is effective and capable of academic sustainability. Many schools use and employ respective applications as instructional delivery systems for lessons during online classes, with Moodle being one of the most commonly used. Moodle is a learning management system (LMS) that stands for Modular Object-Oriented Dynamic Learning Environment (Techterms, 2018). The use of Moodle is truly beneficial because it simplifies the lives of students through its accessibility and simple features. The use of the Moodle application for instructional delivery helped learners value Moodle as an effective learning tool because students found it useful and effective while making learning activities much easier.

Moodle has aided students in completing learning tasks more quickly, and LMS is effective in both teaching and learning (Justice & Zhu, 2017). As the twenty-first century progresses, the centennials will be the most technologically literate. With a single click, all of the information required will be displayed, and there will be no more excuses if the learners do not understand a particular topic. The continuous development of technology is the result of people in the field having a broad understanding of the subject. People must have technological skills or be digitally literate in order to make constant progress. Children's early exposure to various gadgets and social media is advantageous because it influences and affects them to become more digitally literate, thereby assisting learners to have more skills inclined with computers or in any technological aspects. As can be seen today, education is evolving and becoming more adaptable. Where schools use not only face-to-face classes but also a combination of online learning, students and teachers of today must adapt to the progressiveness of education or else struggle and pose a greater challenge to everyone.

Learners who are able to manipulate or use technology effectively will be favored. Especially in schools, where students increasingly rely on internet-based learning materials because everything is now searchable. Being digitally literate gives students an advantage in class, allowing them to learn and excel. As a result, the relationship between digital literacy and student performance across all subjects is directly related. The academic performance of students, whether improving or declining, will reflect on the effectiveness of Moodle. Schools that use online learning must investigate the advantages and disadvantages of an application learning tool for their students. The benefits of using Moodle as a learning tool include the ability for students to download learning files to serve as reviewers and Moodle's task calendar, which allows students to keep track of unfinished assignments. Because reviewers can be downloaded, these benefits enable students to be proactive and excellent in class. The high level of achievement achieved by students across all subjects demonstrates that e-learning education is extremely effective in terms of knowledge acquisition.

Methodology

The researchers used a descriptive correlational design to evaluate the effectiveness of Moodle to Universidad De Manila college students during the school year 2020-2021. The researchers used questionnaires to collect data, which contain a series of questions about the topic that are designed to be answered by the sample. The questionnaires were created using Google forms. The questionnaire was divided into three sections: the respondents' demographic profile and Moodle assessment tool, digital literacy assessment tool, and general weighted average form. The ME and DLI assessment tools underwent content and face validity as well as reliability testing indicating a Cronbach coefficient alpha of 0.86 and 0.71 respectively. The researchers used a probability sampling method to select the samples for the study. A stratified sampling technique was used by the researchers. The subgroups were made up of the six (6) colleges of the Universidad de Manila, and 1,035 students were chosen out of an estimated 10,000. Descriptive statistical treatment specifically frequency distribution and percentage were used for the demographic profile, while Z-test and ANOVA were used to determine significant differences in means in the aspect of digital literacy index when grouped according to the demographic profile. A Pearson product-moment correlation method was employed to determine the relationships between Moodle effectiveness and digital literacy, Moodle effectiveness and academic performance, and digital literacy and academic performance.

Results and Discussions

The survey was conducted at a university with six different colleges. The data revealed that the College of Teacher Education had the most students represented (20%) (210), followed by the College of Arts and Sciences (18%) (187), College of Engineering and Technology (17%) (176) with a close margin between the College of Criminal Justice and the College of Business, Accountancy, and Economics, and the College of Health and Sciences (14%).

Table 1. The Level of Moodle Effectiveness in terms of Personalized Learnings

PERSONALIZED LEARNINGS	Mean	Response	Descriptive Interpretation
1. UDMoodle helps me a lot to understand how courses will be downloaded for reading.	3.75	Agree	Highly Effective
2. I can access UDMoodle conveniently.	3.62	Agree	Highly Effective
3. I can easily access UDMoodle at any time of the day.	3.48	Agree	Highly Effective
4. I can read my lessons asynchronously.	3.82	Agree	Highly Effective
5. I can still access my lessons even I am offline.	3.01	Undecided	Moderately Effective
GRAND MEAN	3.53	Agree	Highly Effective

Legend: 4.21 - 5.00 Very Highly Effective; 3.41 - 4.20 Highly Effective; 2.61 - 3.40 Moderately Effective; 1.81 - 2.60 Fairly Effective; and 1.00 - 1.81 Not Effective.

Table 1 depicts the effectiveness of moodle in terms of personalized learnings. According to the table above, moodle is extremely effective in terms of personalized learning, with a grand mean score of 3.53. Personalized learning is proposed to help students achieve academic success by determining their learning needs, interests, and goals and then providing learning experiences that are tailored to a greater or lesser extent for each student. It is supported by a study that claims education personalization is a method of teaching students based on their prior knowledge, skills, and learning styles (Mudrak & Turcani). Furthermore, the indicator with the highest mean score of 3.82 indicates that respondents agree that moodle is highly effective because they can read their lessons asynchronously, and the indicator with the highest mean score of 3.53 indicates that moodle is highly effective in terms of personalized learnings. Personalized learning is proposed to help students achieve academic success by determining their learning needs, interests, and goals and then providing learning experiences that are customized – to varying degrees – for each student. It is supported by a study that claims education personalization is a method of teaching students based on their prior knowledge, skills, and learning styles (Mudrak & Turcani, 2018). Furthermore, the indicator with the highest mean score of 3.82 indicates that respondents believe moodle is highly effective because they can read their lessons asynchronously.

According to Hiltz (2018), the use of asynchronous learning was also expected to improve task performance due to the asynchronous environment's nature, which allows participants to reflect on their contributions and work at whatever time is most convenient for them. It is followed by a mean score of 3.75, indicating that moodle is highly effective because respondents agree that they were able to understand how courses will be downloaded for reading. Furthermore, with a mean score of 3.62, respondents agree that they can easily access moodle. Meanwhile, with a score mean of 3.48, few respondents agree that moodle is highly effective because respondents can easily access moodle at any time of day. Morze (2021) stated in his research that e-learning courses have grown in popularity as a means of delivering knowledge to students in higher education institutions. The majority of learning process participants state that they benefit from the ability to gain knowledge regardless of time, location, or device used. However, the dimension with the lowest mean score of 3.01 revealed that respondents are undecided about accessing their lessons while offline.

Table 2. The Level of Moodle Effectiveness in terms of Content Media Resources

CONTENT MEDIA RESOURCES	Mean	Response	Descriptive Interpretation
1. Server lag and error have not been observed.	3.08	Undecided	Moderately Effective
2. I can easily download and upload all the media contents.	3.59	Agree	Highly Effective
3. I can upload files without problems.	3.41	Agree	Highly Effective
4. I can easily download files from UDMoodle.	3.78	Agree	Highly Effective
5. I grasp fully understand the content of our lesson through the use of an integrated collaborative app embedded in UDMoodle.	3.48	Agree	Highly Effective
GRAND MEAN	3.47	Agree	Highly Effective

Legend: 4.21 - 5.00 Very Highly Effective; 3.41 - 4.20 Highly Effective; 2.61 - 3.40 Moderately Effective; 1.81 - 2.60 Fairly Effective; and 1.00 - 1.81 Not Effective.

Table 2 shows the level of moodle effectiveness on content media resources, with a grand mean score of 3.47 indicating that respondents believe moodle is highly effective. The dimension with the highest mean score of 3.78 revealed that respondents agree that moodle performs extremely well because they can easily download files from it. This is followed by a mean score of 3.59, indicating that respondents agree that they were able to easily download and upload all media contents. In their study, Sari and Setiawan (2018) defined media learning as "anything that becomes a means of delivering information from the sender to the recipient in order for what is delivered to be well received." In other words, media is anything that transports information from a source to a receiver.

Furthermore, with a mean score of 3.48, respondents agree that moodle is highly effective because they can fully understand the content of their lesson by using integrated collaborative apps embedded in moodle. With a mean score of 3.41, respondents also agree that they can easily upload files to moodle. According to a previous study, students discovered that uploading their syllabuses and session plans to the app improved their learning. Overall, the students found moodle to be a useful educational tool (Goyal & Tambe, 2015). However, the lowest mean score of 3.08 indicates that respondents were undecided about observing server lag and error.

Table 3. The Level of Moodle Effectiveness in terms of Collaboration and Networking

COLLABORATION AND NETWORKING	Mean	Response	Descriptive Interpretation
1. I can get feedback from my faculty regarding my performance.	3.37	Undecided	Moderately Effective
2. I can communicate easily via chat inside the UDMoodle.	3.05	Undecided	Moderately Effective
3. I can send personal message to my professors using UDMoodle.	3.06	Undecided	Moderately Effective
4. I can send personal message to my classmates using UDMoodle.	3.03	Undecided	Moderately Effective
5. I always have access to the entire university announcement.	3.52	Agree	Highly Effective
GRAND MEAN	3.21	Undecided	Moderately Effective

Legend: 4.21 - 5.00 Very Highly Effective; 3.41 - 4.20 Highly Effective; 2.61 - 3.40 Moderately Effective; 1.81 - 2.60 Fairly Effective; and 1.00 - 1.81 Not Effective.

Table 3 displays the grand mean score of 3.21, indicating that moodle is moderately effective for collaboration and networking. Respondents had access to the entire university announcement, according to the indicator with the highest mean score of 3.52. This is followed by a score mean of 3.37, indicating that respondents are undecided after receiving feedback from faculty about their performance. Furthermore, with a score mean of 3.06, respondents are undecided about sending personal messages to their professors and communicating via chat within the UDMoodle, with a score mean of 3.05. Furthermore, with a mean score of 3.0, respondents are undecided about sending personal messages to their classmates via UDMoodle. As online learning grows in popularity, it is necessary to look for ways to improve collaboration activities through online learning. Collaboration, according to Breckman et al. (2018), provides a variety of experiences for students while balancing openness and resistance to change. Furthermore, the moodle has a positive effect on promoting creative collaboration among college students, as well as discussion activities, active opinions, active questions, and increased imagination.

Table 4. The Level of Moodle Effectiveness in terms of Progress Tracking and Transparency

PROGRESS TRACKING AND TRANSPARENCY	Mean	Response	Descriptive Interpretation
1. I monitor or see professor-student activity in the UDMoodle.	3.51	Agree	Highly Effective
2. I received comments from my professor on my academic performance.	3.46	Agree	Highly Effective
3. UDMoodle enables me to see my scores of my submitted works.	3.87	Agree	Highly Effective
4. UDMoodle would provide information, notify me on my pending assignments, activity, and deadline, and give immediate feedback on the mistakes committed during quizzes and examinations.	3.81	Agree	Highly Effective
5. I am able to check my attendance regularly together with my classmates and professors' last access and recent activity in the UDMoodle.	3.58	Agree	Highly Effective
GRAND MEAN	3.65	Agree	Highly Effective

Legend: 4.21 - 5.00 Very Highly Effective; 3.41 - 4.20 Highly Effective; 2.61 - 3.40 Moderately Effective; 1.81 - 2.60 Fairly Effective; and 1.00 - 1.81 Not Effective.

Table 4 demonstrates that moodle is extremely effective in terms of progress tracking and transparency, with a grand mean score of 3.65. This is followed by the highest mean score of 3.87, indicating that respondents agree that they can see their submitted works or activities. With a mean score of 3.81, the respondents also agree that they are knowledgeable enough because moodle provides information and notifies them of any pending or due assignments or activities. Furthermore, students agree, with a mean score of 3.58, that they were able to check their attendance with their classmates and professors by knowing the most recent visit to moodle. It is followed by a mean score of 3.51, indicating that students agree to have access to monitoring activities. Moreover, with a mean score of 3.46, students agree that they received comments or feedback from their professor regarding their academic performance. Progress tracking is the process of gathering project team progress information and entering it into the work plan, whereas research transparency refers to the shared belief that "researchers have an ethical obligation to facilitate the evaluation of their evidence-based knowledge claims" by making their evidence, analysis, and research design public (Lupia & Elman, 2018). Furthermore, any content submitted to moodle sites, such as forum posts or quiz answers, grades, and feedback, moodle automatically generates and stores usage data as you interact with the site.

Table 5. The Level of Moodle Effectiveness in terms of Navigational Features

NAVIGATIONAL FEATURES	Mean	Response	Descriptive Interpretation
1. I can connect easily onto UDMoodle using my device.	3.58	Agree	Highly Effective
2. I can edit features like adding and removing submission.	3.86	Agree	Highly Effective
3. I can easily connect using my login credentials.	3.78	Agree	Highly Effective
4. I can switch easily from the dashboard to my courses back and forth.	3.71	Agree	Highly Effective
5. The navigational features are organized and user friendly.	3.71	Agree	Highly Effective
GRAND MEAN	3.73	Agree	Highly Effective

Legend: 4.21 - 5.00 Very Highly Effective; 3.41 - 4.20 Highly Effective; 2.61 - 3.40 Moderately Effective; 1.81 - 2.60 Fairly Effective; and 1.00 - 1.81 Not Effective.

Table 5 displays the level of moodle effectiveness in terms of navigational features, with a grand mean score of 3.73 indicating a highly effective result. It was discovered that the ability to edit features such as adding and removing submissions received the highest mean score of 3.86, followed by the second highest mean of 3.78, where users can easily connect to Moodle using their login credentials. Furthermore, this is followed by an equal score mean of 3.71 in which respondents agree that users can switch back and forth from the dashboard to their courses and that the navigational features are organized and user friendly. Finally, the indicator with the lowest mean score of 3.58 indicates that respondents can easily connect to UDMoodle using their device. According to the findings of the study, the majority of respondents are capable of navigating moodle's navigational features.

Martin et al. (2015) used the heuristic evaluation method to assess the usability of three popular learning management systems, including moodle, from the perspective of experts. The findings revealed that moodle had a strength in its ability to assist users in recognizing, diagnosing, and recovering from errors. However, the findings revealed that moodle lacked flexibility and efficiency of use. The installation and use of Moodle's features is usually under the control of the university's management and administrators (El-Bahsh, 2016). Despite the fact that there is a lack of research that identifies weak aspects of moodle that need to be improved from the perspective of students. These flaws include features that are not supported or are not installed on the local instance of moodle used by universities, as well as the presence of detailed usability issues on various moodle interfaces (Minovi, 2015).

Table 6. The Level of Digital Literacy Index in terms of Information Search

INFORMATION SEARCH	Mean	Response	Descriptive Interpretation
1. I observe cyber safety, search, and anti-plagiarism protocols.	3.99	Agree	High Digital Literacy Index
2. I know how to recognize reliable and unreliable sources of information on the Internet.	4.07	Agree	High Digital Literacy Index

3. I know the basic rules for safe information search in an online environment.	4.13	Agree	High Digital Literacy Index
4. I use search engines and educational portals to find information on the internet.	4.12	Agree	High Digital Literacy Index
GRAND MEAN	4.04	Agree	High Digital Literacy Index

Legend: 4.21 - 5.00 Superior Digital Literacy Index; 3.41 - 4.20 High Digital Literacy Index; 2.61 - 3.40 Moderate Digital Literacy Index; 1.81 - 2.60 Fair Digital Literacy Index; and 1.00 - 1.81 Low Digital Literacy Index.

Table 6 displayed the respondents' digital literacy index in terms of information search, which obtained a high digital literacy index with a grand mean of 4.04. The highest mean of 4.12 indicated that respondents have a high digital literacy index in terms of understanding the fundamental rules of safe information search in an online environment. According to Santhosh and Thiyagu (2019), cyber awareness entails understanding one's online identity, protecting one's own, and improving one's computer security. It also includes comprehending the rise of internet use, comprehending online identity, safeguarding online privacy, and enhancing computer security. Following the highest mean, a score of 4.12 revealed that respondents have a high digital literacy index in terms of being able to use search engines and educational portals to find information on the internet. Continuing with the mean of 4.07, it was discovered that the respondents have a high digital literacy index when it comes to recognizing reliable and untrustworthy sources of information on the internet. Similarly, the mean score of 3.99 concluded that the respondents have a high digital literacy index in terms of cyber safety, search, and anti-plagiarism protocols. The study's findings revealed that the majority of students are confident in their level of information literacy skills, particularly in using other people's work without committing plagiarism (Adeoye et al., 2017). Furthermore, with a mean score of 3.89, it revealed that the respondents have a high digital literacy index, indicating that they are confident in their ability to obtain information from the web. According to Emiroglu and Kurt (2018), cognitive strategies are important in gaining access to accurate and reliable information. It is also important for students to decide on the adequacy, reliability, and relative quality of the acquired information.

Table 7. The Level of Digital Literacy Index in terms of Computer Application

COMPUTER APPLICATION	Mean	Response	Descriptive Interpretation
1. I can evaluate new programs and modernity of computer and software.	3.67	Agree	High Digital Literacy Index
2. I know how to install and uninstall program or applications.	4.08	Agree	High Digital Literacy Index
3. I can execute Office 365 functions such as Word, PowerPoint, Excel, Access, and Publisher.	3.87	Agree	High Digital Literacy Index
4. I am confident in navigating the internet for needed information.	3.92	Agree	High Digital Literacy Index
5. I can assemble, manipulate, adjust computer hardware, and troubleshoot basic computer problems.	3.34	Undecided	Moderate Digital Literacy Index
GRAND MEAN	3.77	Agree	High Digital Literacy Index

Legend: 4.21 - 5.00 Superior Digital Literacy Index; 3.41 - 4.20 High Digital Literacy Index; 2.61 - 3.40 Moderate Digital Literacy Index; 1.81 - 2.60 Fair Digital Literacy Index; and 1.00 - 1.81 Low Digital Literacy Index.

Table 7 described the digital literacy index in terms of the computer application of the respondents, which attained a high digital literacy index in a grand mean of 3.77. The highest mean score of 4.08 defined that the respondents have high digital literacy index in having the ability of installations and uninstallations of programs or applications. Technology-enhanced learning is expanding rapidly because of research sowing benefits for learners in terms of engagement and convenience and entertainment (Morris, et al., 2016). The academic application of mobile devices is very varied and include information retrieval, communication, interaction, assessment, social learning, data input and professional development (Conole et al., 2008 as stated by Morris, et al., 2016). Followed by a score mean of 3.92, this expressed that the respondents have a high digital literacy index in having the confidence in navigating the internet for needed information. According to Briandana and Dwityas (2019), if compared to media in this age, smartphone is the most useful material to equip and facilitate internet, people and easily obtaining and information and data. Correspondingly with a mean of 3.87, it interpreted that the respondent has a high digital literacy index in knowing how to execute Office 365 functions such as Word, PowerPoint, Excel, Access, and Publisher. Microsoft Office 365 is a set of software tools for the use of students and different way of storing and saving data. Office 365 for education provides necessary support for development including collaboration and communication. (Carutasu & Pirnau 2017). Uniform to the rest above, the mean of 3.67 concludes that the respondents have high digital literacy index in evaluating of new programs and modernity of computer and software. In an era in which computers and technology changes extremely rapidly the architecture of a device may change, understanding the foundations of computer system will make it possible to understand changes in the context of improvement of the device (Englander and Wong 2021). Dissimilar, the mean of 3.34 reported that the respondents have a moderate digital literacy index in assembling and troubleshoot computer problems. Troubleshooting is a process that helps people identify issues regarding and occurring in their system or computer. It is a process of parsing out the items that are causing problems. It is a systematic process used to locate the cause of a fault in a computer system and correct the relevant hardware and software issues. Using a logical and methodical approach is essential to successful resolution eliminate variables and identify causes of problems in a systematic order whether the problem may result in software or hardware problems (Academy, 2020).

Table 8. The Level of Digital Literacy Index in terms of Media Features

MEDIA FEATURES	Mean	Response	Descriptive Interpretation
1. I know how to initiate Spotify, Google and Apple music, and any other music application.	3.94	Agree	High Digital Literacy Index
2. I use Google Drive, iCloud, Dropbox, and Google Cloud for saving large files.	3.99	Agree	High Digital Literacy Index
3. I know how to edit in Adobe Photoshop, Premiere, Canva, Lightroom, and any other photo and video software/application.	3.51	Agree	High Digital Literacy Index
4. I have ICT technical skills to create documents such as presentations, digital stories, wikis, and blogs.	3.34	Undecided	Moderate Digital Literacy Index
5. I believe that media is completely independent and objective as it can accidentally or intentionally distort information.	3.84	Agree	High Digital Literacy Index
GRAND MEAN	3.72	Agree	High Digital Literacy Index

Legend: 4.21 - 5.00 Superior Digital Literacy Index; 3.41 - 4.20 High Digital Literacy Index; 2.61 - 3.40 Moderate Digital Literacy Index; 1.81 - 2.60 Fair Digital Literacy Index; and 1.00 - 1.81 Low Digital Literacy Index.

Table 8 displayed the respondents' digital literacy index in terms of media features, with a high digital literacy index indicated by a grand mean of 3.72. The dimension with the highest mean of 3.99 confirmed that the respondents have a high digital literacy index when it comes to saving large files using Google Drive, iCloud, Dropbox, and Google Cloud. According to Formplus (2021), the evolution of digital technology has successfully diverted users away from traditional local storage systems to hard drives and, more recently, remote server-based storage systems. The second to highest mean (3. 94) indicated that respondents have a high digital literacy index when launching Spotify, Google, and Apple Music, as well as any other music application. Interestingly, because of the continued advancement of mobile phone technology, many consumers may use their mobile data and be able to easily access the mobile application. As a result, with a mean of 3.84, respondents have a high digital literacy index in terms of believing that media is independent but also objective because it can distort information. According to the study, the respondents (3.84) have a high digital literacy index when it comes to editing using Adobe Photoshop, Premiere, Canva, Lightroom, and other photo and video software or applications. Finally, the indicator with the lowest mean of 3.34 indicated that respondents had a moderate digital literacy index in ICT technical skills to create documents such as presentations, digital stories, wikis, and blogs.

Table 9. The Level of Digital Literacy Index in terms of Communication

COMMUNICATION	Mean	Response	Descriptive Interpretation
1. I use various communication channels like e-mail, blogs, messengers, and group chat in social networks.	4.25	Strongly Agree	Superior Digital Literacy Index
2. I observe generally accepted netiquette such as respectful communication when navigating the Internet.	4.09	Agree	High Digital Literacy Index
3. I build my social and learning networks through collaborative applications such as Skype, Zoom, Google Meet, and Discord.	4.05	Agree	High Digital Literacy Index
4. I frequently utilize internet for correspondence through Facebook, messenger, twitter, Instagram, and Viber.	4.10	Agree	High Digital Literacy Index
5. I analyze and discuss my ideas through blog and forum.	3.35	Undecided	Moderate Digital Literacy Index
GRAND MEAN	3.97	Agree	High Digital Literacy Index

Legend: 4.21 - 5.00 Superior Digital Literacy Index; 3.41 - 4.20 High Digital Literacy Index; 2.61 - 3.40 Moderate Digital Literacy Index; 1.81 - 2.60 Fair Digital Literacy Index; and 1.00 - 1.81 Low Digital Literacy Index.

Table 9 revealed the respondents' digital literacy index in terms of communication, which obtained a high digital literacy index supported by a grand mean of 3.97. According to Goswami (2020), there are a variety of internet communication tools that allow people to network both personally and socially. The highest mean of 4.25 indicated that respondents had a high level of digital literacy when it came to using various communication channels such as e-mail, blogs, messengers, and group chat in social networks. Surprisingly, it provides a platform for people all over the world to connect and share their ideas and opinions. As with many other aspects of modern life, the ways in which people collaborate in education have shifted from face-to-face to digital. Second, a mean of 4.10 indicated a high digital literacy index, with respondents agreeing to frequently use the internet for correspondence via Facebook, Messenger, Twitter, Instagram, and Viber. Furthermore, observing generally accepted netiquette, such as respectful communication when using the internet, yielded a mean of 4.09, indicating a high digital literacy index. Effective communication is essential for success in online education, and the term netiquette refers to using courtesy and politeness when communicating with others online (UTEP, 2017). This is followed by the ability to create social and learning networks using collaborative applications like Skype, Zoom, Google Meet, and Discord, which is supported by a mean of 4.05, which is interpreted as a high digital literacy index. Interaction and active engagement with teachers, according to Hopper and Bernhardt (2016), are at the heart of effective instructional leadership. This social collaboration app is ideal for gaining access to knowledge and information, as well as developing feelings of trust that help to build the social capital required to cultivate a collaborative culture (Fullan & Quinn, 2016). As with many other aspects of modern life, how people collaborate has shifted from face-to-face interactions to digital interactions. Finally, the opportunities to analyze and discuss ideas via blogs and forums received the lowest mean of 3.35, indicating limited experience but still translating as a moderate digital literacy index. According to Horkoff (2015), students' workload increased as a result of a lack of online discussion forums and the inability to freely express their ideas and views due to poor integration and synthesis of ideas, insufficient moderation by the lecturer, and some subject-related issues. Students' collaboration experiences can be hampered by a lack of technological strategy integration or platform access.

Table 10. The Level of Digital Literacy Index in terms of Digital Technology

DIGITAL TECHNOLOGY	Mean	Response	Descriptive Interpretation
1. I follow trends and keep abreast with technological advancements.	3.59	Agree	High Digital Literacy Index
2. I regularly use digital technologies in my educational research and creative projects.	4.07	Agree	High Digital Literacy Index
3. I know how biometrics, wearable health technology, and ID scanners work.	3.52	Agree	High Digital Literacy Index
4. I am familiar with booking applications, GPS trackers, and electronic banking.	3.67	Agree	High Digital Literacy Index
5. Modern gadgets and applications such as mobile phones and computers help me in everyday life.	4.34	Strongly Agree	Superior Digital Literacy Index
GRAND MEAN	3.84	Agree	High Digital Literacy Index

Legend: 4.21 - 5.00 Superior Digital Literacy Index; 3.41 - 4.20 High Digital Literacy Index; 2.61 - 3.40 Moderate Digital Literacy Index; 1.81 - 2.60 Fair Digital Literacy Index; and 1.00 - 1.81 Low Digital Literacy Index.

Table 10 shows the respondents' digital literacy index in terms of digital technology, which received a high digital literacy index with a grand mean of 3.84. The highest mean of 4.34 revealed that respondents have a superior digital literacy index in modern technologies and applications such as mobile phones and computers, which aids in daily life. This is supported by Rumanyika's (2015) study, which describes how mobile devices adapt to educational systems and how they can be used to benefit students' learning. Using digital technology on educational research and creative projects achieved the highest mean, with a mean of 4.07 interpreted as a high digital literacy index. 3.67 was assigned to familiarity with booking applications, GPS trackers, and electronic banking, as well as a high digital literacy index.

According to Henderson (2017), students benefit from technology by improving their technological skills. The second to least 3.59 of the weighted means established that the respondents have a high digital literacy index in terms of students following trends and staying up to date on technological advancements. According to a study conducted by Mohamed (2021), in today's generation, particularly during this pandemic, students follow technological innovation trends that circulate online. Knowledge of biometrics, wearable health technology, and ID scanners had the lowest mean of 3.52 among all indicators, possibly indicating a lack of access to these technologies. According to Deeble (2019), digital technology is consistently associated with moderate learning gains and that technology approaches should be used to supplement other teachings rather than replace more traditional approaches (Bustria et al., 2021).

Table 11. Academic Performance of the respondents in terms of General Weighted Average

Grade Range	Frequency	%	Letter Equivalent	Descriptive Interpretation
98% - 100%	1	0.1%	A+	Excellent
95% - 97%	22	2.13%	A	Excellent
92% - 94%	259	25.02%	A-	Very Satisfactory
89% - 91%	410	40%	B+	Very Satisfactory
86% - 88%	247	24%	B	Satisfactory
83% - 85%	67	6.47%	B-	Satisfactory
79% - 82%	20	2%	C+	Good
76% - 78%	2	0.19%	C	Good
75	7	0.67%	C-	Poor
TOTAL	1035	100		

This table displays the results of the respondents' academic performances across all subjects using their General Weighted Average (GWA). As seen above, 410 out of 1,035 respondents received a GWA of 89 percent - 91 percent, indicating that 40 percent of the respondents performed very satisfactorily, demonstrating positive learning outcomes despite the lack of face-to-face interaction. It demonstrates that respondents have the freedom to access courses at their own pace and location, and that they were given a variety of topics and content (Al-Rahmi, 2020).

Table 12. Summary of the Result of Test of Difference

Demographic Profile	p - value	Interpretation	Decision
Year Level	0.0014	Significant	Reject the Null Hypothesis
Screen Time	0.0000	Significant	Reject the Null Hypothesis
Family Income	0.0000	Significant	Reject the Null Hypothesis
College Affiliation	0.1147	No Significant	Fail to Reject the Null Hypothesis
Sex	0.2540	No Significant	Fail to Reject the Null Hypothesis
Age	0.1995	No Significant	Fail to Reject the Null Hypothesis

*Significant at 0.05 level

Table 12 summarizes the results of the test of difference, which show that perceived digital literacy differs significantly when respondents are grouped by year level, screen time, and family income, thus rejecting the null hypothesis. However, when respondents were clustered based on college affiliation, gender, and age, it was discovered that there is no significant difference in perceived digital literacy, and thus the null hypothesis cannot be rejected.

Table 13. Summary of the Analysis Between the Relationship of Moodle Effectiveness and Digital

Correlations	p- value	Pearson r	Qualitative Description	Interpretation	Decision
Moodle Effectiveness and Digital Literacy	0.000	0.535	Moderate Positive Correlation	Significant	Reject the Null Hypothesis
Moodle Effectiveness and Academic Performance	0.333	-0.030	No Correlation	Not Significant	Fail to Reject the Null Hypothesis
Digital Literacy and Academic Performance	0.001	0.101	Weak Positive Correlation	Significant	Reject the Null Hypothesis

**. Correlation is significant at the 0.01 level (2-tailed).

Table 13 summarizes the findings of the study on the relationship between Moodle effectiveness and digital literacy, Moodle effectiveness and academic performance, and digital literacy and academic performance. It was discovered that Moodle effectiveness and respondents' digital literacy have a moderate positive correlation, as evidenced by the obtained r value of 0.535 and p value of 0.000. Furthermore, the table revealed that respondents' digital literacy and academic performance have a weak positive correlation with r values of 1.01 and p values of 0.001, indicating that the null hypothesis on both is rejected, indicating significant relationships. However, there is no correlation between Moodle effectiveness and academic performance, with a computed r value of -0.030 and a p value of 0.333 accepting the null hypothesis, indicating that there is no significant difference between Moodle effectiveness and academic performance of the respondents.

Conclusion and Recommendations

The demographic profile of the respondents in terms of college affiliation revealed that the majority of the respondents are from the College of Teacher Education, are predominantly female, and range in age from nineteen to twenty-one years old. More than half of the respondents are third-year students who used mobile phones during the day until midnight using mobile data as a mode of connectivity. The majority of respondents have a family income of 15,000 pesos or less. The Moodle learning management system was rated highly effective as a platform for instructional delivery by respondents in the dimensions of personalized learning, content media resource, collaboration and networking, progress tracking and transparency, and navigational features. Respondents' digital literacy index indicated a high level of proficiency in information search, computer application, media features, communication, and digital technology. The academic performance of the respondents in terms of general weighted average (GWA) revealed a very satisfactory performance on the part of the vast majority of respondents, with only a few students achieving an excellent GWA. Surprisingly, there were no failing grades among the respondents. There is a statistically significant difference in respondents' digital literacy when grouped by year level, screen time, and family income, but none on college affiliation, sex, and age. The findings indicated that there is a positive moderate relationship between Moodle effectiveness and the respondents' digital literacy index. Furthermore, a weak positive relationship was established between respondents' digital literacy and academic performance. However, statistical calculations revealed no significant relationship between Moodle effectiveness and academic performance. A proposed implementation of "REVAMP (Remodeling and Enhancement of Virtual Academics through Moodle Platform)" is highly recommended to re-calibrate Moodle by targeting identified weak areas through integration of collaborative apps and other vital instructional features to enhance its pedagogical design to fit the academic needs and interests of the students, which can ultimately impact their academic performance. As a result, the university must support and fund these LMS pedagogical guidelines to leverage the virtual learning environment for its most important stakeholders – the students.

Acknowledgement

The research group want to express their profound gratitude and deep regard to the UDM administration and CHS Dean for their support to this academic project. The Panel of Experts and technical support are also acknowledged for their expertise, exemplary guidance, and constant valuable feedbacks throughout the duration of this undertaking. Their immense help and constructive criticisms kept this work evolve to its current form and the researchers are extremely grateful for this knowledge-creation experience.

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Culture of Excellence and Teaching Performance: The Mathematics Scholars' Experience

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Abstract - This explanatory sequential mixed method study aimed to determine the mathematics teaching performance and culture of excellence of Bachelor of Secondary Education (BSEd) major in Mathematics DOST-SEI scholar graduates for the period of 2010-2015 of a certain state university in Western Visayas region in the Philippines. Eight BSEd major in Mathematics DOST-SEI scholar graduates and their eight department heads were included in the study purposively. The researcher adopted the Results-Based Performance Management System (RPMS) tool of the Department of Education and utilized interview guide and observation guide as data gathering instruments. Moreover, the statistical tools used were mean and standard deviation to analyze and interpret quantitative data. On the other hand, thematic analysis was used to analyze qualitative data. The study revealed that the overall performance of the scholar graduates was very satisfactory. Moreover, the scholar graduates manifested the following in their teaching performance: a) content knowledge and relevance by using Dep-Ed materials as main reference, mastery of the content, and contextualized content; b) instructional strategies by using collaborative and cooperative learning strategies and game-based strategy; c) learning activities and instructional materials by using teacher made activities, using ICT-based instructional materials and manipulatives; d) lesson organization and presentation by using 4A's Model and DepEd's format in lesson planning and ensuring smooth transition of topics; e) classroom management by fostering a conducive learning environment, imposing rules and practicing routines, and incorporating positive and negative reinforcement; and f) evaluation by using paper and pencil tests and authentic assessment. Furthermore, scholar graduates personified the culture of excellence in mathematics education by integrating different strategies in teaching mathematics, being passionate and dedicated, and by pursuing continuous professional growth. In addition, they have manifested excellence in mathematics education through the following: conducted action researches in mathematics education, attended various seminars and trainings, actively involved in different committees and organizations in and out of school, initiated school-based math related activities, and received recognitions as winners and coaches in different math related and non-math related activities.

Keywords - Mathematics teaching performance, Culture of excellence, Mathematics teachers' experience, Scholars' performance, Public school mathematics teachers

Introduction

The importance of education in national development can never be underestimated. Education is a key investment that can break the Filipinos' seemingly endless cycle of poverty, and provides the people, particularly the youth, with more opportunities. No country in the world can harness the full potential of its people without committing them to standard education. This makes education the most potent vehicle for the development and empowerment of an individual; economic, political and social development; national growth; and enthronement of peace (Exam Ethics Project, 2005). For quality education to be realized, the most important medium to be considered are the teachers. They are the lifeblood of any education system. They are on the front line in discharging educational objectives. As a major input of education quality, the performance of teachers is widely recognized as a critical factor influencing education quality. To ensure effective teaching, the evaluation of teaching performance is necessary.

Furthermore, with education as one of the priority investments of the state for a sustained and developed country, thousands of high school and college students from all over the Philippines receive undergraduate scholarships courtesy of the Department of Science and Technology – Science Education Institute (DOST-SEI) every year. Through these scholarship programs, the DOST-SEI envisions to have developed the Philippines' human resource capacity in science and technology as required to produce demand-driven outputs that meet global standards (DOST-SEI, 2015).

In return, DOST-SEI scholars are required to render service in the country, preferably in their fields of specialization, after graduation for a period equivalent to the number of years they enjoyed the scholarship. The success of these programs offered by the DOST-SEI could only be measured through its graduates' achievements and contributions to the country.

Moreover, in terms of Mathematics Education, according to Prokop, et al. (2015), some research studies indicate that the quality of education depends on the teachers' provision to students based on what they do in the classroom. They concluded that, in preparing the students of today to become successful individuals of tomorrow, science and mathematics teachers need to ensure that their teaching is effective. This only implies that teachers hold an important role in effectively pursuing the teaching-learning process.

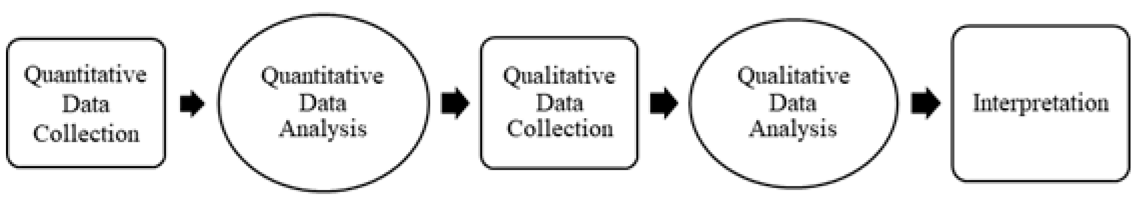
Hence, this study determined the teaching performance and career movement of DOST undergraduate grantees, specifically the graduates of Bachelor of Secondary Education (BSEd) major in Mathematics. This could show how DOST-SEI scholars exhibit excellence in mathematics education which may inspire and motivate other teachers to embody the culture of excellence in their profession.

This study is anchored from Human Capital Theory advocated by classical economist Van-Den-Berg in 2001, as cited by Delos Reyes (2013). It states that formal education is a more productive investment considered to be an equally, or could be a more, worthwhile investment as/than physical capital; that society would gain from a more educated population and labour force. The investment of the government through DOST-SEI scholarships offered to deserving students reflects the Human Capital Theory. It is based on the belief that expanding educational opportunities and access promotes economic growth. Hence, the Human Capital Theory is most responsible for the wholesome adoption of education and development policies.

Methodology

This study employed the mixed method research design. This type of research design used both quantitative and qualitative methods in a single study to provide a more comprehensive understanding of the research problem. Specifically, the researcher utilized the explanatory sequential mixed method which involved the collection of quantitative data, followed by the use of qualitative method, to refine the findings. The two types of data were analysed separately, with the results of the qualitative analysis used by the researcher to expand upon the results of the quantitative study (Fraenkel, Wallen & Hyun, 2012).

Figure 1. Explanatory Sequential Mixed Method Design



Using this design, the researcher aimed to determine the mathematics teaching performance of Bachelor of Secondary Education (BSEd) major in Mathematics DOST-SEI scholar graduates of a certain state university in the Philippines for the period of 2010-2015. Specifically, it sought answers to the following questions: a) What is the mathematics teaching performance of BSEd major in Mathematics DOST-SEI scholar graduates in terms of their Individual Performance Commitment and Review Form (IPCRF) results?; b) How do BSEd major in Mathematics DOST-SEI scholar graduates manifest their performance in terms of: (a) Content Knowledge and Relevance, (b) Instructional Strategies, (c) Learning Activities and Instructional Materials, (d) Lesson Organization and Presentation, (e) Classroom Management, and (f) Evaluation?; and c) How do DOST-SEI scholars personify the culture of excellence in Mathematics Education?

The mathematics teaching performance in this study was gathered from eight BSEd major in Mathematics DOST-SEI scholar graduates of a certain State University in Western Visayas region for the period 2010-2015 and their eight department heads. This study included all the scholar graduates under DOST-SEI scholarships who graduated from the period 2010-2015 and took BSEd major in Mathematics in the included university, as reflected on the list provided by the DOST-SEI Region VI. Furthermore, these scholar graduates were at least four years in service after graduation. All of them were currently employed in the Department of Education (DepEd). On the other hand, the eight department heads included master teachers, head teachers or principals of the graduate scholars. These department heads observed the graduate scholars during their classroom observation for their RPMS portfolio of the previous year.

For the purpose of this study, the researcher adopted the Results-Based Performance Management System (RPMS) tool of the Department of Education (2018) and utilized interview guide and observation guide as data gathering instruments. These research instruments were subjected to content validation by different experts depending on the nature of each instrument.

Moreover, the statistical tools used were mean and standard deviation to analyse and interpret quantitative data. On the other hand, thematic analysis was used to analyse qualitative data.

Results and Discussions

Table 1. Performance of Scholar Graduates as Reflected in their IPCRF (Individual Performance Commitment and Review Form)

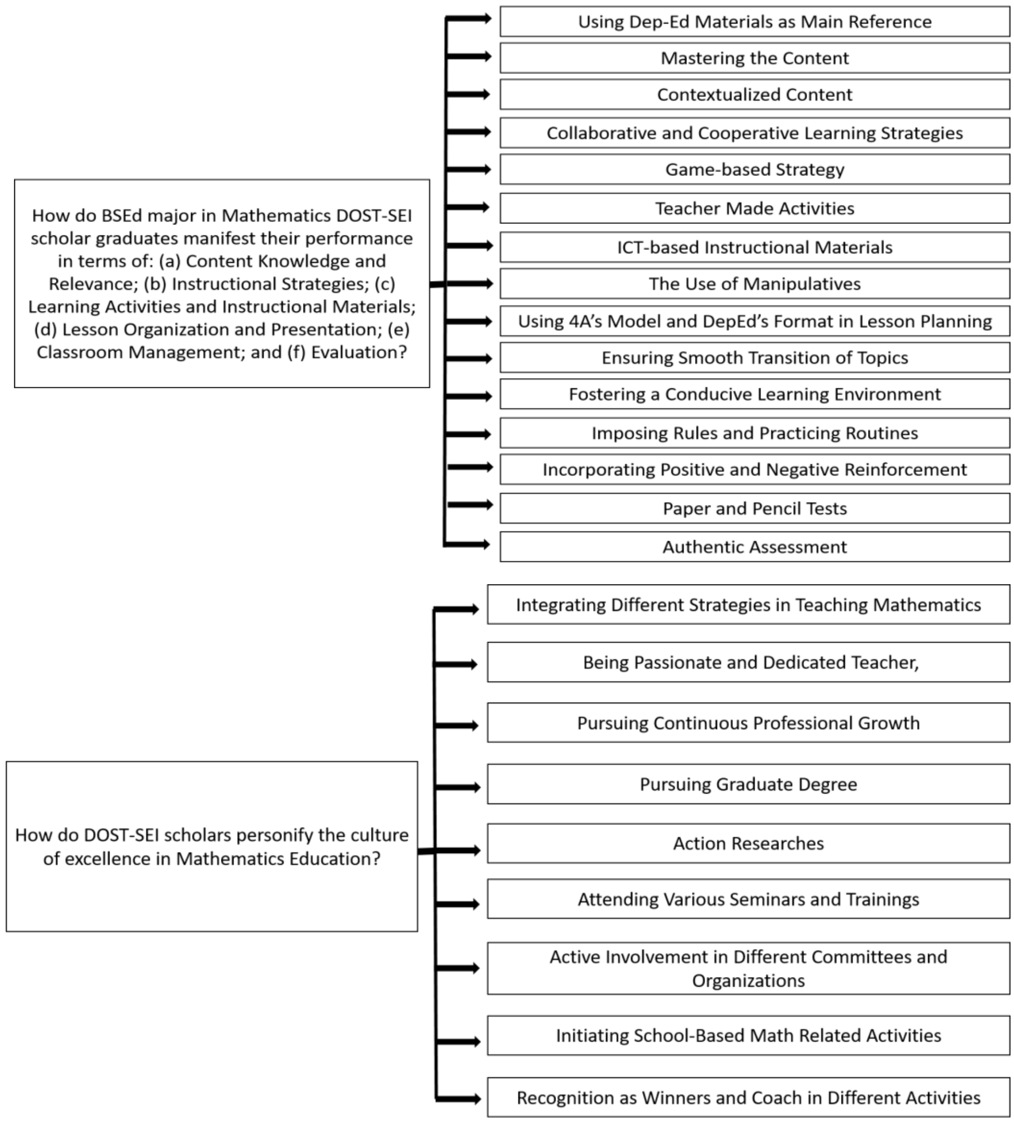
	Key Result Areas (KRA's)											
Scholar	Content Knowledge and	Wt 22.5 %	Learning Environment and Diversity of	Wt 22.5 %	Curriculum and Planning	Wt 22.5 %	Assessment and	Wt 22.5 %	Plus Factor	Wt 10%	Overall Rating	Adjectival Rating
1	4.83	1.09	4.67	1.05	5.00	1.13	4.17	0.94	5.00	0.50	4.70	O
2	4.67	1.05	4.33	0.97	4.50	1.01	4.17	0.94	3.50	0.35	4.33	VS
3	4.67	1.05	4.50	1.01	5.00	1.13	4.33	0.97	5.00	0.50	4.66	O
4	4.00	0.90	4.00	0.90	4.00	0.90	4.00	0.90	4.00	0.40	4.00	VS
5	4.33	0.97	4.33	0.97	4.50	1.01	4.44	1.00	5.00	0.50	4.46	VS
6	4.33	0.97	4.00	0.90	4.67	1.05	4.33	0.97	5.00	0.50	4.40	VS
7	5.00	1.13	5.00	1.13	4.67	1.05	4.33	0.97	5.00	0.50	4.78	O
8	5.00	1.13	5.00	1.13	4.67	1.05	4.00	0.90	4.00	0.40	4.60	O
Mean	**4.60**	**1.04**	**4.48**	**1.01**	**4.63**	**1.04**	**4.22**	**0.95**	**4.56**	**0.46**	**4.49**	**VS**
SD	**0.33**	**0.07**	**0.37**	**0.08**	**0.30**	**0.07**	**0.15**	**0.03**	**0.58**	**0.06**	**0.24**	

Note: Description is based on the following scale. 4.500-5.000 (Outstanding), 3.500-4.499 (Very Satisfactory), 2.500-3.499 (Satisfactory), 1.500-2.499 (Unsatisfactory), below 1.500 (Poor)

As reflected in table 1, the study revealed that the overall mean rating of the informants was "very satisfactory" (M = 4.49, SD = 0.24). In addition, half of the informants received an adjectival rating of "outstanding" and the remaining half was rated as "very satisfactory". This shows that the informants have very satisfactory performance as reflected by their IPCRF results. The low standard deviation results from different KRA's suggest that the ratings of the informants were close to each other or comparable. Moreover, this indicates that the range of scores given by their rater were almost the same or similar to each scholar.

This result is in consonance to the recommendations of Sabio et al. (2020) that a more subjective performance assessment tool must be utilized like those that involve participation of the students and the immediate superior of the concerned public school teachers. Hence, IPCRF really served its purpose of evaluating the performance of teachers in terms of quality, efficiency, and timeliness. The objectives of IPCRF as indicated are actually the duties and responsibilities that each teacher must do in service. This is a tool to check and balance if one is doing his duties diligently with quality, efficiency and on time (Canoma, 2017).

Figure 2. Scholar's Mathematics Teaching Performance and Culture of Excellence



Moreover, the scholar graduates manifested their performance through the following: a) content knowledge and relevance by using Dep-Ed materials as main reference, mastery of the content, and contextualized content; b) instructional strategies by using collaborative and cooperative learning strategies and game-based strategy; c) learning activities and instructional materials by using teacher made activities, using ICT-based instructional materials and manipulatives; d) lesson organization and presentation by using 4A's Model and DepEd's format in lesson planning and ensuring smooth transition of topics; e) classroom management by fostering a conducive learning environment, imposing rules and practicing routines, and incorporating positive and negative reinforcement; and f) evaluation by using paper and pencil tests and authentic assessment.

Mastery of content. In general, scholar graduates exhibit mastery of the content based on what the researcher had observed during their classes. Scholar graduates knew their subject matter because they delivered it fluently and had no difficulty in teaching their subject. They didn't even hold any papers or notes in the whole class duration since they really mastered what they were teaching. It was written on the observation guide of the researcher that scholar graduates were able to deliver the content of their lesson effectively. They were confidently standing in front of their class and abled to answer all their student's questions about the lesson. In other words, they came into their class well-prepared.

In addition, one of the teachers who accompanied the researcher during the classroom observation wrote that the graduate scholar was well-versed on the content. Another teacher also noted that the graduate scholar shown confidence in discussing the topic.

This result attested what McGraner et al. (2010) cited that in Mathematics, teacher's mastery is necessary for effective teaching to take place. The logic herein is that teachers who possess strong mathematical knowledge at great levels of depth and span are more likely to foster student's ability to review, conjecture and solve problems, while also able to more accurately diagnose and address students' mathematical misconceptions. Lapuz (2010) further emphasized that to be an effective teacher; one needs to understand the content that he/she teaches and knows how to explain that content in a manner that the students understand. There are teachers who do not know the content well enough to effectively teach it.

Game-based strategy. The study revealed that in order to make mathematics fun for the students, a game-based strategy is an effective way. Some examples of games employed by scholars during the observation were "Represent Me", and "Right or Left, Where am I", "Find your Partner", and "Locate your Classmates". Scholar graduates believed that students are active when the teacher incorporates games into the lesson. Game-based learning played important role in teaching by encouraging students to collaborate, communicate, interact and work in teams.

It supported the findings of Felicia (2011) which concluded that games are effective in motivating and engaging students. Felicia's research highlighted three key elements which contribute to the motivational outcomes of games: the design of the game, the medium used to deploy the game, and environmental scaffoldings such as support from teachers. The study further observed that games which produce motivational outcomes have clear goals, rules, multi-sensory cues, narratives and a good balance between the educational and entertaining features. Active support from teachers in the introduction and running of the game also increased student motivation. Furthermore, games can enhance the social skills of students as well as improve their skills in understanding and solving problems (Kirikkaya, Iseri, & Vurkaya, 2010). Lastly, students enjoyed the inherent sense of challenge and motivation provided by games and boosting of confidence (Nisbet & Williams, 2009).

ICT-based instructional materials. In terms of instructional materials, scholar graduates utilized new trends of using ICT-based instructional materials in their class such as Quexbook app which can be installed in their students' cell phones. This contains lectures and examples in one particular subject especially in senior high school, Geogebra, Powerpoint presentations and softwares such as Selector Tool. Graduate scholars believed that technology nowadays is really an effective and efficient tool in teaching.

Results of the study supported the statement of Hudson, Kadan and Vasquez (2010) that they conducted a study wherein teachers used PowerPoints, web-based games, the internet, projectors, smart boards, calculators, videos and music to enhance their mathematics instruction and the result of the study revealed that technology improves achievement, enables learners to be independent problem solvers, competent and creative thinkers, as well as effective communicators. To add, Nabayra (2020) found out that students appreciate the concepts of mathematics in nature when hybridized with videos as revealed by their learning experiences with the e-modules. It stimulates their interest and makes learning effective, efficient, and flexible. The developed video-based e-module indeed served its purpose as a unique and student-friendly instructional material integrating technology which would facilitate 21st century students' learning at home through videos and maximize classroom time for more productive activities.

4 A's lesson plan and DepEd format. Lesson plan is vital in the teaching-learning process. It acts as a guide for the whole discussion and enables the teacher to reflect on what objectives they must achieve. Results showed that scholar graduates followed the DepEd format, which starts with reviewing a previous lesson or presenting a new lesson, establishing a purpose for the lesson, presenting examples of the new

lesson, discussing new concepts, and practicing new skills, developing mastery, finding practical applications of concepts, and making a generalization and an evaluation. On the other hand, some of them were also following the 4A format of the lesson plan, which starts with Activity, followed by Analysis, Application and Assessment. They believe that with a lesson plan, they have a guide on how to present their lessons in class in a sequential and logical manner. According to the scholars, given that they are required to create a lesson plan every day in their school, they ensured that their lesson plans were well-made.

The results of the study support the claim of Kiplagat, Role, and Makewa (2012) that, in sequencing lessons, a lesson presentation follows a logical sequence. Information is presented in an organized manner, regularly checking the students' understanding, providing an opportunity for practice, giving frequent feedback, and concluding lessons by reviewing main points.

Imposing rules and practicing routines. Majority of the scholar graduates shared that in managing their classrooms, imposing rules and practicing routines were needed to ensure discipline among students and also a well-organized learning environment. Results indicated that scholar graduates still practiced the traditional way of imposing rules, which students needed to obey, lest they suffer a consequence, usually a punishment. On the other hand, having routines helped the students and teachers to quickly accomplish day-to-day tasks and allow fewer opportunities for disruptions.

During classroom observation, the researcher found that the scholar graduates imposed rules and regulations and practiced routines. Rules and regulations were posted on the walls or the bulletin boards. Among the rules that the researcher observed were proper behaviour inside the class, students were not allowed to go out of the classroom without asking permission, students raised their hands when they want to answer, the teacher immediately called the attention of the student if they were noisy and not paying attention, and they students must clean the classroom before leaving. Additionally, one scholar practiced a command that whenever the class was so noisy, they were called by the name of their section, then students will answer "attention" — sounding like a military routine — for the entire class to pay attention to the teacher.

These results prove what Akram (2010) have found out—that discipline ensures how students behave when the teacher is teaching. He further notes that a classroom that is not well-organized results in discipline problems. This means that a teacher who has a classroom management action plan will have an organized and structured classroom where both the teacher and students will know what to do.
On the other hand, Fuligni et al. (2012) found that daily classroom routines predict children's opportunities for engagement in activities of various academic content and different kinds of instructional interactions with teachers.

Authentic assessment. Other than the paper-and-pencil test, the scholar graduates also applied authentic assessment in evaluating their students' performance. This includes performance tasks, asking questions, portfolio, projects, outputs and using infinite algebra/calculus software.

After observation, the researcher found that authentic assessment was evidently one of their ways to evaluate their students' performance. They keep on asking questions all throughout the lesson to test the students' understanding. This process is student-centred since it allows students to discover ideas with the questions as guides to get the correct information and share them in class. Performance-based assessment was also shown through activities conducted during the application part of the lesson. Lastly, the researcher also asked the scholar graduates to allow her to view samples of the projects, outputs and portfolios their students created.

This confirms what Miller, et al. (2009) found that portfolio assessment provides information for both formative and summative evaluation. Portfolio gives an insight into the progress the child is making and reveals the strength and weaknesses of the child, unlike traditional assessment. It is clear that both performance and portfolio assessment provide feedback to students, whereas traditional assessment does not.

In other words, authentic assessment necessitates students using their prior knowledge, recent teachings, and skills to overcome real and complicated problems. For instance, students can create a project on a topic they have chosen, prepare a research report and present their end products for evaluators (DiMartino & Castaneda, 2007).

Furthermore, scholar graduates personified the culture of excellence in mathematics education by integrating different strategies in teaching mathematics, being passionate and dedicated, and by pursuing continuous professional growth. In addition, they have manifested excellence in mathematics education through the following: conducted action researches in mathematics education, attended various seminars and trainings, actively involved in different committees and organizations in and out of school, initiated school-based math related activities, and received recognitions as winners and coaches in different math related and non-math related activities.
Conclusion and Recommendations

Scholar graduates performed very satisfactory in all key result areas, or KRA, of their IPCRF results. This implies that they have indeed internalized the value of excellence, sustained quality education and embodied competence in the field of mathematics education.

The teaching performance of the scholar graduates was laudable as evinced by their teaching performance in terms of content knowledge and relevance, instructional strategies, learning activities and instructional materials, lesson organization and presentation, classroom management, and evaluation. This shows that the scholar graduates have discovered new teaching strategies, different ways of teaching mathematics, used innovative materials and assessed students in various means not just to make themselves productive and excellent in mathematics education but to achieve quality learning for the students. It's only then that teaching becomes rewarding.

They have also notably embodied excellence in different aspects of their teaching careers personally and professionally as reflected on their achievements in personifying a culture of excellence to uplift the standard of mathematics education in the country. All of these indicate that the scholar graduates have indeed lived according to what the DOST-SEI have expected of them. That is, to accelerate the development of excellent S&T human resources of the Philippines to ensure a steady, adequate supply of qualified human resources that can steer the country toward national progress.

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Community-Based Mathematics: Exploring the Local Knowledge of Sugarcane Laborers

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Abstract - Sugarcane laborers are usually tillers of the land of sugarcane barons. They were previously known as "sacada". They are usually comprised of non-skilled workers coming from the different regions of the country, gathered together and started to build a new community. As a distinct group working together in the field of sugarcane, they might have developed new or modified concepts, skills, and competencies which their group could easily understand. This study aims to explore and describe these existing concepts, skills, and competencies specifically in mathematics. The study was participated by twenty sugarcane laborers who had worked for at least fifteen years. The study utilized qualitative method employing ethnography. The corpus of the study are the observation records, semi-structured interviews, and focused-group discussions. Results revealed that sugarcane laborers have developed their mathematical concepts, skills, and competencies based on the function of mathematics in the community. Multiple terms for a numeral occurs due to the place where they come from and education they had. Basic computation skills vary from person to person depending if they have gone to school or not, and non-standard measurement were prevalent than standard ones because of its practicality. These findings show that to promote mathematics in the community, educators should understand its utilization based on its context.

Keywords - community-based mathematics, contextualized learning, ethnomathematics, mathematics and culture, indigenous knowledge, Negros Occidental

Introduction

In the late 1960's, prominent sugar barons continuously expand their sugarcane plantation into the remote areas of Cadiz City. This leads to the influx of sugarcane laborers coming from the different places in Negros Occidental and its surrounding islands. These people were a mixture of Ilonggo (people coming from the island of Panay which usually speaks Hiligaynon dialect) and Bisaya (people coming from Cebu and speaks Bisaya or Cebuano as a dialect). These people gathered together for a common vision, to work in the sugarcane field as laborers which were also known as sakada a word with Spanish origin to refer to the migrant workers doing manual labor usually in agricultural lands. Most of these sugarcane laborers did not have a formal education characterized by going to school. They would usually rely on the wisdom of their masters when it comes to the work assigned to them and their salaries and wages.

Similarly, as a culture-sharing group, these group of people had developed their own ways of practices, and even knowledge peculiar to their community. It is on this built community knowledge that the researcher intends to explore. Specifically, the researcher intends to explore their indigenous knowledge in mathematics. Bishop as cited in Rosa and Orey (2011) expressed that it had been thought for a long time that Mathematics is a neutral and culturally-free discipline however, this view of mathematics is Eurocentric in nature which led some researchers to argue and support the development of ethnomathematics, a term coined by D' Ambrosio as cited by Llaneta (2017) which refers to the art or technique of explaining, knowing, and understanding diverse cultural contexts in mathematics. In addition, according to Domite (2003), mathematics is culturally relevant which means, many communities develop mathematical activities which may be different from the context of formal mathematics but give them essential knowledge and skills to deal with their rudimentary life (Bishop, 1993). Hence, it is imperative to understand that indigenous knowledge in mathematics and its implication is equally important in understanding and improving the lives of the people in the community. More so, the appreciation of the role of indigenous mathematics in the development of learning. Similarly, exploring and understanding the indigenous knowledge might be the best option of connecting to the community and can be used as an approach of contextualizing and localizing education to make it more relevant to future learners.

Statement of the Problem

This study aims to describe and explore the indigenous knowledge in mathematics of Negrense sugarcane laborers in the conduct of their day-to-day lives.

Specifically, this study sought to answer the question:

1) What are the indigenous knowledge related to mathematics existing in the community?; and
2) How do people in the community transfer the indigenous knowledge in mathematics?

Methodology

This chapter presents the components of the study which includes the research design, participants of the study, research instrument, and data gathering procedure.

Research Design

A qualitative method employing ethnography was utilized in the study. Ethnography, according to Creswell (2014) is a design of inquiry which the researcher studies the shared patterns of behaviors, language and action of an intact cultural group in a natural setting over a prolonged period of time. Ethnography was deemed appropriate since the researcher aims to describe the life of sugarcane laborers and their indigenous knowledge and skills in mathematics. Since the study is ethnographic, the researcher was immersed to the community under study. Observations and interviews were the main source of data and other documents served as secondary source of data.

The study is under the social constructivism paradigm of research. As a social constructivism paradigm, it believes that individuals seek understanding of the world in which they live or work (Creswell, 2003). This meaning is subjective of their experiences toward certain situation and it might be varied and multiple. The research relied mostly on the participant's view of the situation since the meanings they developed are formed based on social interaction. As a social constructivist research, it aims to present broad and general questions to the participants so that the participants can construct the meaning of a situation made in discussion and interaction with other persons. The paradigm usually addresses the processes of interaction among individuals and focus on specific context in which people live and work in order to understand the historical and cultural setting of the participants. The researcher recognize his own background shapes the interpretation of the study and acknowledge how this interpretations flows from his own personal, cultural and historical experiences. Thus the researcher's intent then is to make sense or interpret the meanings others have.

Sampling Design

The study followed a qualitative research design thus, non-probability sampling techniques is deemed most appropriate. Non-probabilistic sampling provides researchers with strong theoretical reasons for choosing the cases to be included in the sample.

A combination of qualitative sampling was utilized in the conduct of the study. Theoretical sampling also called a purposive sampling developed by Glaser and Strauss in the 1960; and subsequently modified by Strauss and Strauss and Corbin (Glaser and Strauss, 1967; Strauss, 1987; Strauss and Corbin, 1990) was used in determining the participants of the study. Theoretical sampling refers to selecting groups or categories to study on the basis of their relevance to the research questions, theoretical position and the explanation being developed. The researcher selects the individual and site for the study because he has to select them in complement with the research problem and central phenomenon of the study.
The researcher established criteria for studying selected individuals (criterion sampling). According to Hammersley and Atkinson (1995), the criteria for selecting the participants and what to study are based on gaining perspective on chronological time in the social life of the people, representative of the culture-

sharing group in terms of demographic and the context that leads to the development of behavior. In ethnography, there is no specific number of participants to be included.

Since the nature of the research is ethnographic, the researcher used observation notebooks, transcriptions, still pictures and audio recordings for data gathering. The conduct of observation is necessary since the researcher aims to view relationships on the interactions, actions and behaviors and the way people interpret these, and act on them. The researcher is interested in a range of dimensions including daily routines, conversations, language, and styles of behaviors, active construction of solutions to certain problems or situation specifically in mathematics. Interviews are performed using semi-structured interview guide. It is deemed appropriate since the researcher is interested to explore the people's knowledge, views, understanding, interpretations, and experiences for which the research questions are designed. Moreover, the research is textual, situational and interactional in nature. The point is to identify how a social process which functions address the research problem connected with their own perception (Hollway and Jefferson, 2000).

Participants of the Study

Cadiz City is one of the city of the province of Negros Occidental. It is one of the leading cities in the production of sugarcane (Britannica, 2015). As a sugarcane-dominated land, most of the residents of the city devote themselves in working at the sugarcane field especially those who live in the upland barangay of the city.
The participants of the study are the sugarcane laborers of Purok Zofermin, Barangay Magsaysay, Cadiz City, province of Negros Occidental. They were chosen as participants because they are permanent residents of Negros Occidental, and they are sugarcane laborers who had been working for fifteen years and up.

The table below shows profile of the participants who were interviewed and observed during the conduct of the study.

Table 1. Participants of the study.

Participants	Age	Sex	Educational Attainment	Civil Status	Length of Service	No. of Members
Participant 1	50	F	elementary graduate	married	30	5
Participant 2	52	M	grade 3	married	43	6
Participant 3	56	F	grade 3	married	50	6
Participant 4	63	M	grade 3	widowed	41	4
Participant 5	40	F	elementary graduate	married	29	5
Participant 6	48	F	grade 3	married	33	5
Participant 7	65	F	elementary graduate	married	47	4
Participant 8	42	M	1st year hs	married	18	5
Participant 9	59	M	4th year hs	married	20	7
Participant 10	45	F	grade 5	widowed	31	4
Participant 11	80	F	grade 1	widowed	50	8
Participant 12	49	M	grade 1	married	38	4
Participant 13	47	M	grade 1	married	37	5
Participant 14	47	F	grade 1	married	41	5
Participant 15	29	M	grade 2	married	17	5
Participant 16	56	M	osy	married	45	4
Participant 17	61	F	grade 3	married	37	9
Participant 18	71	M	grade 3	married	46	10
Participant 19	41	F	grade 3	married	34	6
Participant 20	71	M	1st year hs	married	15	6

The data above shows that the researcher had selected participants who have long experience as a laborer in the sugarcane field. The researcher assumed that these respondents given that they had been working in the field for quite a long time might had gained much experience and had developed enough knowledge and skills in the sugarcane work which is relevant in the conduct of this study. It is imperative to note that most of the respondents had not finished elementary level. 50% of the participants are male and the rest are female. All of them were married but two of them had already been widowed. Most of the participants shared that their children were sugarcane laborers like them while some went to other places for work.

Instrument

The researcher developed a semi-structured interview guide. The first part aimed to gain basic information about the participants of the study. The second part was consisted of open-ended questions that aimed to explore the experiences of the participants as sugarcane laborers and discover their indigenous knowledge in mathematics. Though the researcher had prepared a list of questions during the actual interview, it was not religiously followed as the researcher tried to adapt to the convenience occurring during the conversations.

The researcher assured that though informal conversations is occurring, the questions in the statement of the problem are answered. The conversation would usually focus on their experiences as a sugarcane laborer, the reasons why they became sugarcane laborers, their daily activities, leisure, acquisition of skills and the indigenous knowledge and skills in mathematics that they have.
An observation notebook was utilized for note-taking of the daily observations of the researcher. A smartphone camera was used to capture still photos showing evidences on the life of sugarcane laborers and use of indigenous knowledge in mathematics. An audio recorder was used to document the interviews conducted with the participants. The medium in the conduct of the interview was Hiligaynon for better conversation and understanding, since the participants are generally Hiligaynon-speaking people. However, the researcher used other languages whichever is more comfortable for the participants.

Data-Gathering Procedure

The researcher identified and locate the culture-sharing group to study. One of the considerations during the determination of the data collection procedure is that the participants should have been together for an extended period of time so that the shared language, patterns of behavior and attitudes have merged into an observable pattern. Another consideration for the selection of the participants is the length of time the participants had spent working as sugarcane laborer with reference to the years of their experience in the field. The researcher sought gatekeepers or key informants to help in identifying the participants.

The researcher sought the approval of respective offices of the rural community where the study was conducted. When the approval was granted, the researcher conducted preliminary visits and met the key persons in the community to establish rapport and to be oriented of the culture of the community so that the actions of the researcher will be guided based on their accepted norms and values.

Random visits and immersion lasted for four months. The random visits were conducted in January while the immersion started in the third week of February until the third week of April. It included observations and interviews of the participants. While observing, the researcher conducted interviews to the identified participants from the community to strengthen the observations written. The researcher continued his observation and documented it using field notes, video or still photos. Repetitive visits are conducted when the researcher found a missing relevant data and to confirm the truthfulness of the data gathered.

During the immersion, the researcher acted as keen observer of the daily life and practices of the sugarcane laborers focusing on the use of indigenous mathematics knowledge use. At times, the researcher becomes a participant-observer.

Data Analysis Procedure

The data analysis in the study was consisted of preparing and organizing the data for analysis, and reducing the data into themes through the process of coding and condensing the codes and presenting the data in figures, tables and discussions.

The data analysis spiral suggested by Creswell (2007) was followed. The data management is the first loop in the spiral which is the basis for the beginning of the process. During early stage of the data analysis, the researcher organized the data into file folders or computer files. The researcher then convert the files into text units for analysis.

In data managing, the researcher created and organized files for data. The researcher read through text, and make initial codes. In describing, the researcher described the social setting, actors, and events or take picture of the setting. In classifying, the researcher analyzed data for themes and patterned regularities. In interpreting, the researcher interpreted and make sense of the findings as to how the culture works. Finally, the researcher performed representing and visualizing where the researcher presented narrative presentation augmented by tables, figures and photos.

Results and Discussions

This chapter presents the information gathered and analyzed based primarily on the observations and interviews conducted with the sugarcane laborers. This chapter is divided into two parts: Results, which describes the life experiences and indigenous knowledge of sugarcane laborers in mathematics based on the gathered data; and discussion, which presents the interpretation, made by the researcher.

Community-Based Mathematics: The Development of Work-related Mathematics

Mathematics plays a vital role in the life of sugarcane laborers. It was observed that sugarcane laborer had developed the skills of computing their salary, counting canes, estimating their gains or losses and budget their income to provide the basic needs of the family.
Sugarcane laborers naturally possess knowledge in mathematics. They do not have the full grasp of what mathematics really is as a discipline or as a subject yet you will be amazed how their minds work in terms of computing and estimating. Sometimes they are even unaware that what they are doing is a concept of mathematics already.

The mathematics skills of the laborer were a product of necessity. In early years, when technology was not yet a common thing among them, they tend to depend on the events in their surroundings. They observe patterns and regularity of the events and serve as basis for their inference. For instance, the participants would share that during the younger years, when clocks and watches was not yet a convenience, the sugarcane laborers would look at the direction of the sun and the shadow it casted or wait for the airplane to pass to know the time.

The community utilizes a mathematics that combines the convenience of concepts and skills learned in school, the knowledge and skills that the participants learned from their ancestors, and keen observation of their surroundings. Since some of these knowledge and skills in mathematics had been derived from their experiences and daily observation, this may look something that is different from others. Thus, the development of community-based mathematics.

Number and Number Sense: Multilingualism of Numbers and Computation Skills

Numbers are essential in the life of the sugarcane laborers. They utilize it everyday in their living from the time they wake till they go to work. Numbers can be heard from conversations. As observed, sugarcane laborers do not write numbers frequently but can be derived from their daily conversations with each other. As a result, different dialectal representation occurs for a single numeral. Except for two-digit numbers, the three languages are being used alternately whatever is comfortable for the speaker. In two-digit numbers, Spanish-inspired and English language are dominantly used. It was noticed that the speakers of the English language in numbers are those participants who have reached higher educational attainment. Further, it was observed that the most dominant dialect used in speaking numbers is the Spanish-inspired language. The table below shows sample of how numbers are spoken by the sugarcane laborers.

Table 2. A sample listing of number words spoken by the sugarcane laborers.

Participant	Spanish-inspired dialect	Hiligaynon	English
Participant 1		apat, duwa	thirty-five, eighteen
Participant 2	otsentay-singko nobentay syete		four hundred fifty-eight, one hundred eighty-seven
Participant 3	uno, trentay-singko		
Participant 4	baynte, dise-syete	tag-lima-lima	nineteen seventy-seven
Participant 5	noybe-syentos, mil dos		seven, one
Participant 6	otsenta, dies mil	anom, tatlo	one hundred
Participant 7	sais-syentos	lima, pulo	one-fifty, nine hundred
Participant 8	syete mil, kwarentay-dos	Duha	two thousand one
Participant 9	alas dyes, alas dose	isa, tatlo	nine,twelve
Participant 10	kinyentos, mil syete	isa ka libo, isa ka gatos	one-five, two-fifty

Generally, majority of the sugarcane laborers are Hiligaynon speaking with few Bisaya speaking. However, it was observed that there was a limited use of their dialect in speaking numbers. Spanish-inspired dialect was observed as most prevalent among them. Hence, they have different ways of speaking the same number. Based on observation and interviews, it was found out that the manner of acquiring the language of speaking numbers relied much on the influence of their ancestors and influenced by our conquerors while it was observed that those who used English as a medium of speaking numbers are those who had been to formal education.

When it comes to the computation skills of the sugarcane laborers, it had been observed that most of them do the computation mentally using estimation and approximation most of the time. The researcher also had observed their different methods of adding, subtracting, multiplying, and dividing numbers. The table below shows the manner of computing numbers mentally by the sugarcane laborers.

Table 3. Computation Skills of sugarcane laborers

Operation	Process	Example
Addition and Subtraction Using Expansion Mentally	1. Expand the numbers mentally. 2. Add the expanded numbers. One may start from the numbers with highest place value first or the one with lowest place value. 3. Add them altogether.	18 + 17 (10 + 8) + (10 + 7) (10 + 10) + (8 + 7) 20 + 15 Answer: 35 18 + 17
Addition and Subtraction Using Groups of Tens, Hundreds	1. Identify the number with a closer approximation to groups of tens, or hundreds. 2. Add a certain number that would bring the sum to groups of tens, or hundreds, and subtract the number you added to the other number. 3. Add the remaining numbers.	18 + 17 (18 + 2) + (17 – 2) 20 + 15 Answer: 35
Mental Multiplication	1. Expand the number to be multiplied. 2. Multiply the multiplicand with the multiplier. 3. Add the sums.	18 x 7 (10 + 8) x 7 (10 x 7) + (8 x 7) 70 + 56 Answer: 126
Mental Division	1. Estimate the quotient. 2. Divide.	1200 divided by 8 100 x 8= 800 (so it's more than 100 for each) 1200 – 800 = 400 400 divided by 8 = 50 Answer: 100 + 50 = 150

The idea presented seems to be not an indigenous knowledge as it can also be seen from textbooks used in school and is likewise taught by teachers. Yet, the variety of the processes expressed by the sugarcane laborer showed the rawness of the knowledge which means that people have the ability to develop solutions to a problem if they are given the chance to discover and explore possibilities on their own which they usually learned from observation and experience. It can be assumed that the progress of mathematics knowledge, skills, and competencies are products of historical, social, environmental factors, cultural factors and educational backgrounds.

Measurement: Use of Non-standard Measurement

The observation and interviews conducted by the researcher revealed the prevalence on the use of approximation, estimation, and non-standard measurement. The sugarcane laborers largely depend on the estimation provided by the land owners. A work agreement called pakyaw system mostly rules the terms of labor in the sugarcane field. This is closely followed by an option for a daily rate. The most distinct features of the two is the fact that in pakyaw system, sugarcane laborers are given more independence on when to start and finish the work however, in following the daily rate, they have to work for eight hours in a day.

On the other hand, the use of non-standard measurement and counters are the most evident among sugarcane laborers. The table below shows the application of non-standard measurement in the daily life of sugarcane laborers.

Table 4. List of observed mathematical terms

Mathematical Terms	Meaning
balangit	A non-standard measurement which refers to the distance between the tip of the thumb to the tip of the point finger of an extended hand.
dangaw	A non-standard measurement which refers to the distance between the tip of the thumb to the tip of the middle finger of an extended hand.
dupa	A non-standard measurement equivalent to approximately one meter measured from end of the shoulder up to the tip of the middle finger of an extended arm.
kulitanan	A term used to refer to a sugarcane stalk with at least two to three nodes which approximately measures 6 to 8 inches (15 to 20 centimeters) used for planting.
litsi	A non-standard measure for a canful of rice. The word litsi comes from *"leche"* a Spanish word for milk which refers to the can of milk used for scooping the rice.
tinumbada	A work arrangement where the laborers agree to be paid based on *"tumba"*
tumba	A non-standard measurement equivalent to approximately one square meter measure using *"dupa",* another non-standard measurement.

Based from the responses I had gathered, I can infer that the role of observation and modeling of experts are essential for the success in the transfer of learning and skills to the next generation of sugarcane laborers. Since the role of learned adult is essential, they should be equipped with expertise to ensure the continuity of the skill and its sustainability. Hence, learning is an interplay of observing and mentoring.

The community-based mathematics of the sugarcane laborers had been influenced by their natural, physical and social factors such as language, interaction, necessity, limitations, and environment to name a few which comprises a culture. In a study of Taylor as cited by Beck (2017), he affirmed the role of culture in the development of learning in a child. He assumed that practices in a certain culture affects learning.

The study revealed that the sugarcane laborers developed their own way of doing mathematics. They develop their own solutions and ignite their ingenuity to use the things around them as aid for solving mathematics-related problems. Bishop (1998), shared that mathematics should be agreed as a cultural knowledge, just like any other activities generated by culture such as language, beliefs and rituals, mathematics is also generated by human culture based on their necessity and motivation. The different studies of D' Ambrosio (2001), the main proponent of ethnomathematics, on mathematics exposed that all mathematics practices is a mixture of the so-called academic or school mathematics, the historical evolution of the people (Eves, 1990), and all the natural, social and cultural factors that shaped their development.

As mentioned, mathematics plays a great part in the life of the sugarcane laborer. It is evident in their work and the development of such skill is found to be useful in computing their wage and in their daily transactions. Hence, relevance of the skills to be learned had kindled their interest and motivation to learn mathematics (Phillips, 2013). Moreover, the low educational attainment of some of the participants may have lead to the development of their ingenuity in finding solutions to the problem and triggering their creativity to use the objects in their surroundings to be useful in their lives. Since most of them had not reach high school level or had not graduated elementary, they were less to no exposure to the Eurocentric nature of mathematics. This lead to the development of their indigenous knowledge in mathematics. for consistency in the discussion, indigenous mathematics here is termed community-based mathematics since the researcher believes that the knowledge and skills of the people of the community is not absolutely indigenous rather it becomes a product of a little formal education, observation, and mentoring. Thus, instead of referring it as indigenous, the researcher deemed it more appropriate to call it as community-based mathematics as it reflects the functional mathematics of the community being observed.

The language of mathematics in the community is diversified by the different influences of Spanish, Hiligaynon and English. There is none really that can substantiate the lone existing language in speaking numbers. As a Hiligaynon-speaking community, the people of the community was supposed that Hiligaynon should be the dominant language in speaking numbers but it is otherwise. It was found out that Spanish-inspired way of counting is the more prevalent one. While English is closely following. The reason for this might be that the community is in Negros, which is the largest producer of sugar in the Philippines (Galloway, 2005). Sugarcane farming was greatly influenced by the Spanish who began the production of sugar as early as 1844 and the first sugar barons were Chinese mestizos, Spanish and other Europeans (Billig, 1992). Thus, most of the terms used in sugarcane farming until now are Spanish-inspired and so with numbers. Analyzing the trend of language in speaking numbers among the people of the community, it can be posited that Spanish-inspired language had been acquired from our ancestors and were transmitted from generations to generations. Hiligaynon language had been promoted in the community as a communal language and was basically tried to be taught in school but less functional and English had been acquired from the formal education and in media which becomes a dominant knowledge in the more recent generation. The exposure of the people in the community to the three different dialects had lead to the merging of these dialects and eventually the three dialects were used interchangeably. Shepard as cited by Presmeg (2007) affirms this stating that learning is a social construct, arbitrated through language and other tools that are in consonance with the culture in which the learner are positioned and develops over time. Different dialects to mean the same numeral. Remarkably, the intertwining of these dialects do not confuse the people of the community because the abstractality of the numeral had already been imprinted in their minds. In addition, the familiarization of the term to refer the same number had already been stabilized. Language is not an issue in mathematics as long as the value of a certain number is concrete in the mind of the person, it may have different terms to refer to it, but the representation of that number is the same. Esty (2014) supports this, when he postulated that mathematics has its own language. It uses symbols syntax, grammars and variety of representations yet it is interesting to note that this language of mathematics can be understood.

Astonishingly, it was imperative to note how sugarcane laborers were able to develop their own way of computing numbers. The study revealed a variety of ways on how sugarcane laborers compute the basic operations but one thing is common among them – they compute mentally. Sugarcane laborers tend to develop a mental mechanism which manipulate numbers based on the desired operation. It is theorized that the sugarcane laborers might had learned the skill over time. It is a product of mental conditioning as the laborers face the same pattern throughout their lives. Their long exposure to the field of sugarcane working contributed to the development of their mental mathematics. Perhaps, as their mind encounters similar situation or computation every day, it finally develops a mental construct which immediately activates every time the laborer faces a math problem. One of the reasons of the fluency of some participants in doing mental solutions might be the use of compatible numbers. Compatible numbers are numbers that are easy to solve for various reasons such as rounding up to the nearest group of hundreds or thousands (Gonzales, 2018). In the case of the sugarcane laborers, they are used to compute numbers ending in zeroes which is in agreement to the description of compatible numbers. The role of estimate had also performed a noteworthy role since they do computational estimates in solving which is an effective strategy as supported by the study of Cochran & Dugger (2013).

More interestingly, it is important to note how the sugarcane laborers activated their creativity to make things around them useful and become part of their indigenous knowledge. Correspondingly, even ancient civilization had been ingenious enough to use their surroundings for time telling such as the sundials of ancient Egyptians and Greeks and water clocks used by the Romans (Grattan, 2016). Perhaps the use of nonstandard measurement had been universal and travels through generations across countries and communities as it was evidenced by the early use of the sugarcane laborers of the human body as a measure of length. In fact, the ancient people such as the Egyptians (Connor and Robertson, 2003) had used the use of human body such as the foot, the stride, the span of the hand and breadth of the thumb.

The effective use of indigenous knowledge also true not only in mathematics but also in other disciplines such as Science. In fact, in the study of Tiu (2007), it was found out that environment was used as a tool to encourage learning. This indigenous knowledge had been acquired through observation and interaction of the people in the community and from their ancestors. Similar ideas was shared by McGregor

(2004) which believes that the "acquisition of knowledge is a cyclic process in which one learns through regeneration and recreation of current and previous experiences including of one's ancestors and build on prior learning and tradition," and by Tiu (2007) who articulated that indigenous knowledge is acquired through many sources including observation and interaction. The context of education among the people in the community is survival. For them to realize this and be able to survive, they have to learn from the experts (Tiu, 2007). In the study of Kinomis (2016), she revealed that indigenous knowledge and practices are found to be an important catalyst to sustainable development since it is directly related to the environment and its uses. The use of the things around us had been evident in the development of indigenous knowledge and skills. Rajo, Rao and Rao, Simchalam (2016) studied the indigenous knowledge and traditional practices in fishing of the fishermen in Lake Kolleru. In their study, they found out that the fishermen use the materials found in their surroundings as implements for fishing. Msoffe (2013) found out the use of indigenous knowledge of the community people to handle and acclimate to the effect of flood and drought using local environmental and and astronomical indicators, Soropa, Gwatebaya, Musiyiwa, Rusere, Mavima, and Kasasa (2015) use the indigenous knowledge of the community in weather forecasting as a means of developing climate change adaptation mechanism.

In relation to the observed phenomena, the learning theories of constructivism postulated by Piaget and Vygotsky as cited by Ozer (2004) might had held a role in the development of such skill in solving. As observed, the sugarcane laborers learn through language, real life experiences, and socialization with the other members of the community. The learning of the sugarcane laborers might been influenced by their predispositions, experiences, culture, time, and physical and mental development. As what Piaget's (1896-1980) version of constructivism suggested, learning is an active process by which a person learn through establishing a balance in the organization of the processes on how things are processed and work (scheme), placing of new information into the scheme (assimilation), and transforming existing schemes or creating a new one (accommodation). While in Vygotsky's (1896-1934) constructivism, he emphasized the role of socialization and culture – such as language, social context, and history among others, as an important cognitive instrument that influence learning. Learning is an active individual and social process which involve needs and sufficient time to be learned (Kolomitro, 2013). This is in agreement with the study of Ozer (2004) who further stated that when a learner is motivated, the learner is driven to use his will, determination and action to gather and select information, construct a mental assumption, test this assumption through experiences and make provable conclusions. Further, their limitations in their educational level might had been likewise a factor that drove them to develop certain ways of solving a problem or developing a solution. They develop a certain way of working out things or establish their own process of solving mathematical equations. The experts termed this heuristic. According to Cherry (2017), heuristics is a mental process known as cognitive shortcuts or rule of the thumb approaches to make decision right away and resourcefully. Researches conducted by Hilbert, Renkl, Kessler, and Reiss (2008) on the use of heuristics had proven to promote learning among learners.

Additionally, one contention that this study aims to address is to explore the learning process involved among the sugarcane laborers especially in the field of mathematics. Propitiously, the study was able to extract the learning process of the sugarcane laborers in terms of acquisition of knowledge and skills and the mental processes that occur during the computation of simple mathematical equations. The findings of the study revealed that sugarcane laborers learn through observation and asking the assistance of person-in-authority.

However, before they get to learn the skill, it was realized that these sugarcane laborers tried to learn the skill because they need it. This necessity served as their motivation. Say for example, the sugarcane laborers choose to work in the field because they are poor and they need to help their parents earn. The situation becomes their motivation. To satisfy this motivation they need to learn. Without the situation, learning for them would be irrelevant and so, they might be able to learn or if they find another solution aside from working in the sugarcane field then the development of such skill would be impossible. Now that the motivation was set, they have the urgency to learn the skill. To do this, they should need a model to follow. In this process comes observation.in this certain stage, motivation should not be erased from the sugarcane laborer as this motivation serves as the driver for the laborer to continue learning the skill. The role of motivation had been as found out to integrate goals, needs and values (Bofah, 2016). In this stage, mental capability of the laborer is necessary to understand what is being observed and to retain it in his/her memory. The laborer will then try to perform the observed task himself/herself until competence of the skill is developed. There are certain aspects where observation is not enough in learning the skill, or the laborer is unsure of what he/she is doing hence, the laborer seeks the help of the expert, it maybe a company in the field of work or the person-in-authority such as the cabo. There are also instances that the laborer did not ask for the help of the expert company or person-in-authority, the person-in-authority corrects the laborer so that learning the correct skill is achieved. That is how the sugarcane laborer learn such skill. Similarly, the findings of the study agree with the study of Hannula (2011, 2015a, 2015b) which mentions the role of self and the environment which referred to as cognition, motivation which directs behavior and the role of emotion which reflects goal-directed behavior.

In addition, one important factor to be considered in learning the skill is the setting where learning should take place. Hence, cultural setting is significant for the people of the community to learn. Rogoff (1990) shared the same idea. A laborer will not learn or encounter difficulty in learning if he/she is learning it in a different context, or setting. In support, Tiu (2007) mentioned that the situation is vital in the sense that any socio-cultural activity could not be secluded from the cultural context in which the learner relates. It only means that the acquisition of knowledge and skills of the sugarcane laborer will be optimized if the laborer will perform it in the cultural setting where it is deemed relevant.

Apparently, the theory of observational learning of Bandura had been pointed out as one theory that can explain how the sugarcane laborers acquire the skills. In observational learning, it is hypothesized that learning takes place with the interaction of cognitive and social process which means learners acquire new skills by observing others who served as models at work. In his work, Bandura cited that in order for a skill to be acquired, one must need to pay attention to the significant behavior, store the information in his memory, reproduce the observed behavior and the learner should be motivated to perform the newly acquired skills. This is further supported by (Groenendijk, Janssen, Rijlaarsdam & Bergh, 2013) which mentioned that different researchers had claimed that observational learning is an effective learning theory in mathematics.

Conclusion

Results revealed that mathematics is quintessential to the sugarcane laborers. It is present in their everyday life and is a necessity for them. The limitation of being poor and having low educational background did not hinder them to develop their own creative and ingenious ways in learning to understand and solve the mathematics of the field. They know how to utilize the resources for their own advantage. They learn to observe and understand their surroundings and apply their learned ideas to develop ways and techniques to address their needs, and deficiencies. Their experience in the field taught them to develop their own ways of thinking and use it effectively.

Sugarcane laborers learn most of their skills through observation, and mentoring. The role of learned adult is essential in the transfer of learning among the sugarcane laborers. Their computational skills had been postulated as a product of culture, socialization and knowledge construction. Further, their mathematics knowledge, skills, and competencies were developed through constant practice or use of the knowledge as it is necessary in their lives as sugarcane laborers.

On the other hand, there is also a necessity to concretize the idea on measurement of the sugarcane laborers and make use of the standard measurement since the use of non-standard measurement is subjective to the user.

The community-based mathematics that the sugarcane laborers possessed may not be different with the knowledge, competencies, and skills taught in school however, utilizing the language they use to refer to it should be promoted to children to make learning of mathematics more relevant and responsive to the needs of the society.

Implication

We can learn much from the life experiences of sugarcane laborers. It opened us to the idea that education should not be too conventional and restricted. People learn when they know that it is essential for their lives. Sugarcane laborers learn the skills because they viewed it to be necessary and important. They were trained to become self-reliant and observant.

In the field of education, the findings of the study could become a contributory research in the development of contextualized learning pedagogy and materials. The indigenous knowledge or community-based mathematics knowledge, skills, and competencies which this study had recorded is an evidence that people in the community develop their own way of thinking which can be used in the advantage of education. Using the indigenous knowledge and skills found in the community in the classroom would promote the continuity and relevance of what is being taught in school and at home. This would bridge the gap between what is knowledge is being taught and what is being existent in the community.

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Technological Readiness and Participation of Students in Online Classes

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Abstract - Online assisted learning using devices such as the internet is an integrated learning platform for learners to acquire and share knowledge beyond the confines of a fixed location during this COVID 19 pandemic. By utilizing online classes via mobile phones, learners can engage in collaborative networks and find information in various diverse environments. This study shares the findings of research at Iloilo Science and Technology University Miagao Campus, Iloilo, to determine the technological readiness and participation of Bachelor of Secondary Education major in Science for the Academic Year 2020-2021. It employed a descriptive survey method using the researcher-made questionnaires related to internet connectivity, types of gadgets used, and familiarity with an online application. The findings showed that all the 69 students' level of technological readiness and participation were mastered and high level of participation respectively when taken as whole and classified as internet connectivity, types of gadgets used, and familiarity with online application. A significant finding was noted in the level of participation in terms of familiarity with online applications which indicates that this variable has an integral measure for the degree of convenience, engagement and literacy of the students for this online education hence related to have effective access and have a quality learning experience to this kind of online learning platform. The findings suggest that to ensure successful online classes, educators need to be aware of the background, technological skills, and participation of learners to have an effective learning environment.

Keywords - Internet, Technological readiness, Participation, Online classes, Technology

Introduction

"From now on, flexible learning will be the norm. There is no going back to the traditional, full packed face-to-face classrooms. The Commission on Higher Education (CHED) has adopted a policy that flexible learning will continue in School Year 2021 and thereafter" according to CHED Chairman, Dr. J. Prospero de Vera III (2021).

In favour with the statement of the Commissioner on Higher Education, Dr. Raul F. Muyong, SUC President III of Iloilo Science and Technology University also stresses out in his statement and quoted "We fully support the direction of Chair J. Prospero "Popoy" de Vera III on flexible learning and the way forward for HEI's".

The 21st century is a challenging time for learners and educators. It is important to know that today's system of education is wildly different in some ways, from past generations. Educators have to plan ways of delivering their lessons that will command interest among learners. In this time of COVID-19 pandemic, technology plays in enhancing teaching and learning in the academe. According to Hagos & Dejarme (2018) as students understand their lessons, they will also develop literacy skills that are useful in their everyday lives.

Teachers must be empowered to use technologies to engage students in learning. It is essential for teachers to have proper use of remote learning technologies for effective delivery of education. The technological readiness of students contributes to their proper comprehension and appreciation of education these days where the delivery of instruction is through technology. Technology readiness is a well-established construct that refers to individuals' ability to embrace and adopt new technology (Caison, et al, 2009).

Educators risk investments in online classes leaving less technologically ready learners behind. Differences in technology readiness relate to learner self-efficacy, engagement, and achievement in an online class. It is in this concept that the researchers are interested to know how readily equipped the students are in this new mode of learning platform and how participative they are in attending their online classes. So, this study will determine the technological readiness and participation of Bachelor of Secondary Education (BSED) major in Science students in online classes of ISAT U Miagao Campus, AY 2020-2021.

Methodology

This research study used the descriptive survey method. Descriptive studies aim to accurately and systematically describe a population, situation, or phenomenon. (McCombes, 2020). It is an approach that involves observing and describing the present status of the subjects under investigation (Shutterworth, 2008). The choice of such a research method is deemed appropriate because this study seeks to determine the relationship between the variables to describe the level of technological readiness and level of participation of BSED Science Students in Online Classes.

The respondents of the study were the sixty-nine (69) BSED major in Science students coming from First Year to Third Year taking online classes at Iloilo Science and Technology University- Miagao Campus Academic Year 2020-2021. Sampling method used was conducive sampling. It focuses on the conveniently available pool of respondents.

Researcher made-survey questionnaire was administered to the respondents through Google form which was validated by the panel members before it was implemented. The questionnaire was divided into two parts: Part 1 contained the Student's Profile such as their name (optional), sex and year level and checklist for the internet connectivity, type of gadgets used and familiarity with online application. Part 2 contained questionnaire for the level of technological readiness and level of participation in online classes. A total of fifteen (15) statements in each level were included in the questionnaire.

For descriptive data analysis, mean and standard deviation were used. For the inferential analysis, t- test and the One -Way Analysis of Variance (ANOVA) at 0.05 level of significance were used to determine the significant difference in the technological readiness and level of participation in online class. A post-hoc test was used if the result of ANOVA is significant.

Results and Discussions

The finding of the study in the level of technological readiness were;

Table 1. Level of Technological Readiness of the students when classified into type of internet connectivity.

Internet Connectivity	M	SD	Description
Postpaid Wi-Fi	5.00	-	Highly Mastered
Prepaid Wi-Fi	4.07	0.744	Mastered
Mobile Data	3.60	0.866	Mastered
Piso Wi-Fi	3.33	0.577	Moderately Mastered
Others (Pocket Wi-Fi)	3.50	0.707	Mastered

Results revealed that the level of technological readiness when classified into type of internet connectivity extends from moderately mastered to highly mastered. Based on the results, mobile data is mostly used type of internet connectivity (M=3.60; SD= 0.866); followed by the Prepaid Wi-Fi (M=4.07; SD=0.744), then by Others that includes Pocket Wi-Fi (M= 3.50; SD=0 .707) , then Piso Wi-Fi (M=3.33; SD=0 .577) and last the Postpaid Wi-Fi (M=5.00).

This study is comparable to the results of Oberiri et al. (2018) in which they investigated the place of the internet in academic research and learning of students, through both quantitative and qualitative research approaches, using 250 undergraduate students in three selected universities within North-Eastern Nigeria. Results showed that the use of internet mobile data among college /university students has brought a profound and diverse pool of knowledge. On the other hand, Ahlgali (2008) stresses out the advantage of using this mobile data that includes the affordability and the accessibility for those who do not have Wi-Fi connection at their homes and for those who cannot go to computer shops.

Table 2. Level of Technological Readiness of the Students when classified into Types of Gadgets Used.

Type of Gadgets Used	M	SD	Description
Personal Laptop	3.56	0.866	Mastered
Personal Desktop	5.00	-	Highly Mastered
Android Cellphone	3.60	0.765	Mastered

Results showed that the gadgets mastered by the students is android cellphone (M= 3.60; SD=0 .765) followed by personal laptop (M= 3.56; SD=0 .866) and lastly, the highly mastered, personal desktop (M= 5.00) in their online classes.

According to the study of Ngampornchai and Adams (2016), who explored student readiness for online learning in the Northeast of Thailand. Results showed that the devices usually used to connect to the Internet by the students were smartphone (71 %), notebook (19 %), iPad (5 %), and computer (5 %).

Table 3. Level of Technological Readiness of the Students when classified into Familiarity with Online Application.

Familiarity with Online Application	M	SD	Description
Google Search	4.83	0.452	Very Familiar
Google Mail	4.61	0.732	Very Familiar
Google Meet	4.70	0.551	Very Familiar
Google Classroom	3.60	0.833	Moderately Familiar
Facebook	4.96	0.205	Very Familiar
Messenger	4.96	0.205	Very Familiar
Moodle (VLE platform)	4.67	0.610	Very Familiar

Results revealed that the students are very familiar with the majority of the online application presented in this study. Specifically, the Facebook (M= 4.96; SD =0.205) and Messenger (M= 4.96; SD =0.205) which holds the highest number of choices from the students, followed by Moodle (M = 4.67; SD=0.610) that includes the Virtual Learning Environment (VLE) platform which is used exclusively by the ISAT students. On the other hand, the students are moderately familiar with the Google Classroom (M=3.60; SD = 0.833) which have the lowest number of responses from the students.

Facebook is the most popular Social Networking Site and company's website, Facebook's mission is to give people power, share and make the world more open and connected (Facebook, 2016). Studies have shown that Facebook has tools to support educational activities by facilitating, interaction, collaboration, active participation and resource sharing in a critical-thinking environment (Ajjan & Hartshorne, 2008).

The finding of the study in the level of participation were;

Table 4 . Level of Participation of the Students when classified into Types of Internet Connectivity

Internet Connectivity	M	SD	Description
Postpaid Wi-Fi	5.00	-	Very High Participation
Prepaid Wi-Fi	4.07	0.651	High Participation
Mobile Data	3.77	0.608	High Participation
Piso Wi-Fi	3.33	1.100	Moderate Participation
Others (Pocket Wi-Fi)	3.50	.000	High Participation

Results showed that the level of participation when classified into type of internet connectivity extends from moderate to very high level of participation. Based on the results, the students have a high participation in mobile data (M=3.77; SD= 0.608); followed by the Prepaid Wi-Fi (M=4.07; SD=0.651), then by Others that includes Pocket Wi-Fi (M= 3.50; SD= 0.000), then Piso Wi-Fi (M=3.33; SD= 1.100) which have a moderate participation and last the Postpaid Wi-Fi (M=5.00) which have a very high participation from one respondent of the study.

The students believed that the information derived from the internet is useful and trustworthy.This is consistent with Alshahrani et al. (2017) study which concluded that the use of the internet has a profound impact on students' academic self-confidence, self-reliance and student lecturer connectedness.

Table 5. Level of Participation of the Students when classified into Types of Gadgets Used

Types of Gadgets Used	M	SD	Description
Personal Laptop	3.89	0.782	High Participation
Personal Desktop	5.00	-	Very High Participation
Android Cellphone	3.90	0.635	High Participation

Results showed that the gadgets mastered by the students is android cellphone (M= 3.60; SD=0 .765) followed by personal laptop (M= 3.56; SD=0 .866) and lastly, the highly mastered, personal desktop (M= 5.00) in their online classes.

Recent advances in ICT have significantly increased the possibilities of mobile phones being used as instructional tools, because of their increasing processing power, memory and connectivity which have made these technologies drastically more interactive (Pea & Maldonado, 2006). The issues raised by the presence of laptops in the classroom will no doubt increase along with the number and ubiquity of portable devices (e.g., smart phones, tablets). Research conducted at U-M and elsewhere confirms that laptops and other portable devices are like any classroom tool; they function best when they fulfill a clear instructional goal and when they are used in specific ways that support student learning. The careful use of laptops can enrich opportunities for interaction with peers and instructors, as well as with course materials, increasing student engagement and learning (Samson, 2010).

Mobile phones such as android cellphones are one of the fastest growing technologies in this century all over the world and these devices are extremely influencing the adolescents. In the study of Fernandez (2018) which sought to establish students' views on cell phones usage in university classrooms in an educational district in the Eastern Cape Province of South Africa. Results showed that the students were motivated by the cell phone's use in learning. Even though, cell phones when used rarely for personnel use are causing distraction to the classmates, majority of the students believed that mobile phone usage in learning is very effective. The lecturers discourage students to use mobile phones in classrooms; however students still use it to enhance their studies. The researcher concluded that the university students are matured enough to understand that the mobile phones should be used for boons rather than letting themselves into disaster

Table 6. Level of Participation of the Students when classified into Familiarity with Online

Familiarity with Online Application	M	SD	Description
Google Search	4.83	0.452	Very High Participation
Google Mail	4.61	0.732	Very High Participation
Google Meet	4.70	0.551	Very High Participation
Google Classroom	3.60	0.833	High Participation
Facebook	4.96	0.205	Very High Participation
Messenger	4.96	0.205	Very High Participation
Moodle (VLE platform)	4.67	0.610	Very High Participation

Results revealed that the students are very familiar with the majority of the online application presented in this study. Specifically, the Facebook (M= 4.96; SD =0.205) and Messenger (M= 4.96; SD =0.205) which holds the highest number of choices from the students, followed by Moodle (M = 4.67; SD=0.610) that includes the Virtual Learning Environment (VLE) platform which is used exclusively by the ISAT students. On the other hand, the students are moderately familiar with the Google Classroom (M=3.60; SD = 0.833) which have the lowest number of responses from the students.

According to Oproiu (2014), it makes communication process between students and the teaching staff more efficient‖. Students are attracted to Moodle for various reasons. Damnjanovic et. al (2015) identified several factors including communicativeness, information quality, performance outcome, perceived usefulness, satisfaction and system quality that influence students' decision for using the platform. On the other hand, Heggart and Yoo (2018) examined the effectiveness of using Google Classroom for final year primary teacher education students to encourage student voice and agency, and to consider how the platform might influence future pedagogies at the tertiary level. The data showed that Google Classroom increased student participation and learning and improved classroom dynamics. It also revealed concerns around pace and user experience

Table 7.Differences in the Level of Technological Readiness in Terms of Internet Connectivity, Type of Gadgets and Familiarity with Online Application

Variable Description	*M(SD)*	*F(68,1)*	*p*	*Description*
Internet Connectivity		1.44	0.344	Not significant
Postpaid Wi-Fi	5.00			
Prepaid Wi-Fi	4.07(0.799)			
Mobile Data	3.68(0.806)			
Piso Wi-Fi	3.33(0.577)			
Others	3.50(0.707)			
Types of Gadget Used		2.161	0.123	Not Significant
Personal Laptop	3.56(0.866)			
Personal Desktop	5.00			
Android Cellphone	3.81(0.765)			
Familiarity with Online Application		3.205	0.078	Not Significant
Google Search	4.83(0.452)			
Google Mail	*4.61(0.732)*			
Google Meet	4.70(0.551)			
Google Classroom	4.20(0.883)			
Facebook	4.96(0.205)			

Table 7 presents the One-Way ANOVA results of the level of technological readiness in terms of internet connectivity, types of gadget and familiarity with online application. An analysis of variance showed that the level of internet connectivity was not significant, F (1, 68) =1.144, p= 0.344. Also, the type of gadget was not significant, F (1, 68) = 2.161, p = 0.123 and so with the familiarity with online application F (1, 68) = 3.205, p= 0078 . Therefore, the null hypothesis stating that there is no significant difference in the level of technological readiness of the respondents when classified into internet connectivity, types of gadget and familiarity with online application were all accepted.

This means that the internet connectivity, type of gadget used and familiarity with online application have no significant difference on the technological readiness of the respondents.

The result showed that the current study about the technological readiness of students in online classes that includes the internet connectivity, types of gadget used and familiarity with online application has been adopted for classroom use already. For them, online learning is considered a solution to the increasing demand for higher education and with the pandemic that the world faces today as stresses furthermore by CHED Commissioner, Prospero De Vera, that “there is no going back to the traditional, full packed face-to-face classrooms”. This considers the decision of every student to be borne of a desire to become technologically savvy for them to access the quality of learning experiences and to help improve their computer literacy skill which is highly needed in the current online education (Ngampornchai, et al, 2016). Also, drawing impetus from the self-determination of the students, impacts the online learning climate on student’s engagement in this new mode of learning.

Similarly, Muthuprasad (2021) reported out the preparedness, designing and effectiveness of online learning in India due to the COVID-19 pandemic that jeopardize their academic calendars. Through an online survey of 307 students, results showed that majority of the respondents (70%) are ready to opt for online classes to manage the curriculum during this pandemic. They have also prompted new examples of educational innovation using digital interventions. This is a silver lining on a dark cloud considering the sluggish pace of reforms in academic institutions, which continues with millennia-old lecture-based approaches in teaching, ingrained institutional biases and obsolete classrooms. Nevertheless, COVID-19 has been a trigger for educational institutions worldwide to pursue creative approaches for online mode of learning.

Furthermore, the no significant difference of the level of technological readiness in terms of internet connectivity, type of gadget used and familiarity with online application would also support that online class will be as effective as traditional class if it is designed appropriately. These facts clearly shows us that online learning is a perfect substitute for the traditional classroom learning if they are designed suitably (Ngampornchai, et al, 2016)

Table 8. Differences in the Level of Participation in Terms of Internet Connectivity, Type of Gadgets and Familiarity with Online Application

Variable Description	*M(SD)*	*F(68,1)*	*P*	*Description*
Internet Connectivity		1.008	0.371	Not Significant
Postpaid Wi-Fi	5.00			
Prepaid Wi-Fi	4.07(0.651)			
Mobile Data	3.68(0.608)			
Piso Wi-Fi	3.33(1.100)			
Others	3.50(0.000)			
Types of Gadget		1.154	0.339	Not Significant
Personal Laptop	3.56(0.782)			
Personal Desktop	5.00			
Android Cellphone	3.81(0.635)			
Familiarity with Online Application		3.205	0.0163	Significant

Google Search	4.83(0.452)
GoogleMail	4.61(0.732)
Google Meet	4.70(0.551)
Google Classroom	4.20(0.883)
Facebook	4.96(0.205)

Table 8 presents the One-Way ANOVA results of the level of participation in terms of internet connectivity, types of gadget and familiarity with online application. An analysis of variance showed that the level of participation in terms of internet connectivity was not significant, F (1,68)= 1.008, p= 0.371. Also, the type of gadget was not significant, F (1,68) =1.154, p= 0.339. Therefore, the null hypothesis stating that there is no significant difference in the level of participation of the respondents when classified into internet connectivity and types of gadget are accepted.

On the other hand, there is a significant difference in the level of participation in terms of the familiarity in online class, F (1, 68) = 3.205, p= 0.016. Therefore, the null hypothesis stating that there is no significant difference in level of participation in terms of familiarity with online application was rejected. This means that the familiarization with online application for the level of participation in online class has an integral measure for the degree of convenience, engagement and literacy of the students for this online education hence related to have an effective access and have a quality learning experiences to this kind of online learning platform.

The respondents of this study also seemed to indicate that their level of participation and acceptance for online classes in terms of internet connectivity and type of gadgets used tend to be prudent. It is interesting to note that most of their responses regarding online participation were “strongly agree” which means that they have the positive attitude to make these online classes more effective and successful in spite of the pandemic. Similarly, two research studies of Siritongthaworn et al. (2006) and Teo, et al. (2011) found that the participation and acceptance of online learning in Thailand universities was above average, and they wholly adopt to the ICT programs and technology skills related to this.

Numerous challenges were discussed with regard to promoting online education. According to study, new technologies, the Internet, streaming video, net-meeting etc. now makes higher education more accessible and affordable for many students, and for those who would have been unable to pursue higher education in a traditional in-class setting (Bianco & Carr-Chellman, 2002). Consequently, online learning has now become an integral part of higher education institutions’ expanding curriculum.

Conclusion and Recommendations

In view of the preceding findings, the following conclusions were drawn:

The technological readiness of the BSED major in Science students in online class were Mastered. This indicates that BSED major in Science students are technologically prepared and ready in online classes. Students must have the acceptance and awareness of this online education. In this vein, they must have the passion and dedication to become computer literate so that they can maximize the use of technology. The strong relationships of attitude and at the same time, e-learning self-efficacy and subjective norm to use these online classes were the strong predictors that this new platform of learning environment will be viewed efficient and convenient.

The level of participation of the BSED major in Science students in online class was high which indicates that they are highly participative in their online classes. This can be attributed that majority of the respondents own a cell phone preferably the android cell phones. According to them, the advantages of using cell phones are as follows: it is convenient, cost-effective, and portable and can be used to communicate anywhere as long as network connectivity is available.

On the other hand, the students acknowledge the more effective functions of laptops and desktop however, it is less preferred because it is expensive Among the negative impact of gadgets on the educational process of students can be called "peeping answers and solutions" to the task assigned. In this sense, the students become dependent in the fast access of information from the different websites. Simply, the "copy and paste" attitudes in doing the research activities become rampant that become a dilemma to the comprehension skills among students. Moreover, spending time in social networks (i.e. Facebook chat with friend) instead of attending the on-going class hours.

Currently many educational institutions use interactive keyboards, which have already proven to be highly effective. In this present study, the on-going seminars, orientations and trainings among the faculty members in this virtual learning environment helps a lot to equipped both the students and faculty in handling this online education an effective and successful endeavor in response of achieving quality education in spite of the COVID 19 pandemic.

Based on the summary the findings and conclusions, the researchers recommend the following:

Commission on Higher Education should continue providing students with access to the basic technologies that are most important to their academic success. On the other hand, it will increase the level of technological readiness and technological participation of students in their online classes.

ISAT-U Miagao Campus through the supervision of the Administration and collaboration with the Information Technology Department – should provide a better and quality infrastructures for the Internet connection to students and teachers so that the delivery of online education be efficient and effective and through the assistance of the Faculty and Staff of the Information Technology, they will assist their colleague in any problems related to this matter.

It is also recommended to conduct meeting, seminar through online with regards to educational technology to improve students' technological readiness and participation of students

Curriculum Planner need to determine the procedure they should take in teaching and learning process this time of pandemic and give considerations to those who have difficulties and help the students to the extent of what they need.

Policy Maker need provide extra funding on the technological tools that will enable technology benefit to both students and the teachers. They should work together to design policies that integrates ICT in the teaching and learning process.

Teachers need to facilitate the students on the basics of computer skills in technology before they can use web tools available online for teaching purposes. This can simultaneously build the confidence of the students and they will have a positive attitude in embracing technology into education besides strengthening their digital skills.

Students can assess their capabilities in terms of readiness and participation in online learning platform that will serve as basis of improving their performance in online classes. It is improving or maximizing the readiness and participation in online classes

Other researchers are encourage to further improve this study by using the qualitative approach where the perceptions and lived experience of every students engaged in this online classes will be meaningfully documented and be contributed as a significant endeavours for the success of the implementation of this online classes.

Acknowledgement

This research study would not be brought to success without the undying help of several people who gave their full effort, cooperation and moral support to the researchers. The researchers, therefore, wish to express their gratitude to the Iloilo Science and Technology University- Miagao Campus, Research Adviser, Panelist, and to the researcher's Parents who been through with the researchers throughout the study.

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The Effect of Learners' Autonomy and Multiple Intelligences on Grammar Proficiency

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Abstract - Recently, the education system focused on learner autonomy and individualized education. Students are expected to be made aware of their strengths and weaknesses and be responsible for their own learning (Solmundardottir, 2008). It is therefore necessary for the teachers to use various methods that are appropriate and appealing. Hence, they should understand different ways on how learners acquire knowledge. This descriptive correlation research focused on the learner's autonomy and their preferred MI area and its effect on their grammar proficiency. The participants of the study include 505 Senior High School students from Cluster 7 of the Division of Pampanga. To measure the variables, adopted structured instruments were administered to the participants which includes a Learner Autonomy Questionnaire, a Multiple Intelligences Survey Instrument, and an English Proficiency Test. The data was processed using the Statistical Packages for Social Sciences (SPSS) Version 23 and Graph Pad InStat Version 3. Data were analyzed and interpreted using the frequency, percent and mean score for descriptive data, and Multiple Linear Regression Analysis for correlational data. Based on the findings, autonomous learning lean towards their cognitive ability and social factors. It was also revealed that the majority of the learners are more inclined with existential and bodily kinesthetic intelligence. Moreover, the learners' grammar proficiency is at an advanced proficient level. Finally, both the learners' autonomy and their multiple intelligences significantly affects their grammar proficiency. Hence, this study suggested implications on the improvement of grammar instruction in relation to the application of learners' autonomy and Multiple Intelligence Theory inside and outside the classroom.

Keywords - Learners' Autonomy, Multiple Intelligences, Grammar Proficiency

Introduction

Recently, the education system focuses on learner autonomy and individualized education. Students are expected to be made aware of their strengths and weaknesses and be responsible for their own learning (Solmundardottir, 2008). It is, therefore, necessary for the teachers to use various methods that are appropriate and appealing. Hence, they should understand different ways in how learners acquire knowledge.

Learners' Autonomy

For over three decades, learner autonomy has been a vital concept in the field of language learning (Al-Busaidi & Borg, 2012). Learners have to work inside and outside the classroom to develop their language skills. The notion of learner independence or learner autonomy moves into an area where learners can direct their own learning. It could mean those learning activities which take place without the immediate intervention of the teacher (Najeeb, 2013)

A lot of studies about learner autonomy were conducted in terms of different viewpoints (Oracki & Gelisli, 2017). It has become one of the intriguing phenomena in the field of Second Language Acquisition (SLA)Joshi, K. (2011). According to İlknur(2009), autonomy is basically defined as taking the responsibility of an individual's own learning. Some literature relevant to autonomy shows that classroom-based approaches that aim to encourage autonomy are rooted in providing the learners the chances to make their own choices regarding the management of their own learning. Moreover, to develop language skills, learners have to work inside and outside the classroom. The concept of learner autonomy is generally about learners' independence and directing their own learning without the immediate intervention of their teacher Najeeb (, 2013).

Meanwhile, Morrison (2011) argued that support from lecturers or peers in language learners is needed in the learning process because learner autonomy is not an experience of a learner on his own. Although it is defined by different aspects, the common trait is that learners should take charge of their learning and be responsible for the process of learning.

Theory of Multiple Intelligence

As far as learners' skills are concerned, a theory has been very influential to and researchers in terms of understanding the development of each individual. Dr. Howard Gardner, professor of education at Harvard University, published Frames of Mind in 1983, where he discussed Multiple Intelligence Theory. He never expected MI theory to get a lot of attention in the field of education. Initially, he developed his ideas and theory on multiple intelligences as a contribution to psychology. However, his theory was recognized by education, teaching and training communities as an established classic reference work and learning model to understand and teach many aspects of human intelligence, learning style, personality and behavior.
For Gardner (1983), MI Theory focuses on the ability to solve problems or create products that are beneficial within one or more settings. However, recently, Gardner expanded his ideas of intelligence and made it clear as learners' psychological potential that provides them with an opportunity to process information (Zarei & Mohseni, 2012).

Different potentials were explored when Howard Gardner's Multiple Intelligences Theory questioned the traditional notion of intelligence. It provided new opportunities in the educational system in improving different learners' potentials. Learners should be aware of their own learning style because the task to increase the learners' motivation and improve academic results is a challenge for a teacher (Scott-Monkhouse, 2012). Central bits of intelligence were identified in MI Theory, namely: linguistic is the ability to use words effectively orally or in writing; logical-mathematical is the ability to use and understand numbers effectively and to reason well; visual-spatial is the ability to use mental imagery for discerning orientation in space; bodily-kinesthetic is the ability to use physical body movements to express emotion and ideas; musical is the ability to perceive, transform, and express musical forms; interpersonal is the ability to perceive and make the distinction in the moods, intentions, motivations and feelings of other people; intrapersonal is the ability to act adaptively on the basis of that knowledge and self-awareness, and naturalist is the ability to recognize and classify numerous species in the environment.

Gardner also explained the inclusion of "existential intelligence," which he suggests as the ninth one (Tien & Hanh, 2020). He emphasized that those who have a high existential intelligence have the capacity to ponder fundamental questions and the ability to see "the big picture" and to make connections between similar and dissimilar concepts (McCoog, 2010). It can also be defined as the ability to be sensitive to or have the capacity to conceptualize and to discuss deeper or larger questions about the existence of humans. These individuals display the tendency to pose and ponder questions about life, death, and ultimate realities (Pearson, 2011). However, an issue was raised in the article published in 2015 entitled, "Multiple Intelligence: A Widely Misunderstood Notion," where it made mentioned Luistro's statement (2010) that it is not true that the Philippines, in its new DepEd K+12 curriculum, really accepted "Multiple Intelligences" as a theory of education. According to Dekker (2012), "Multiple Intelligences" is still not supported by sound, consistent, and valid empirical proof, so it should not be taught and applied to the classroom without providing enough evidence that it can really help in enhancing students' learning. DepEd is therefore linking its new curriculum to something that is not based on evidence. This theory supports this study in a way that will give light and help to bridge the existing gap among the inconsistent empirical evidence from previous studies related to the improvement of grammar instruction.

Grammar Proficiency

According to Debata (2013), grammar has different meanings for different groups of people. For ordinary citizens, it is the appropriateness of the language that they speak. To the students, it means an analytical and terminological study of sentences. It is also the study of words, and the ways words are put together which serves as a guide in constructing sentences. In addition, some findings have shown that all educators consider grammar as a significant element in English as a Second Language (ESL) learning. It is necessary to be taught a system that helps language to work, a heart of language and a crucial element in language learning.

Grammar may be abruptly defined as manipulation and a combination of words to create new meaning. How units of meaning may be formed in any language is governed by a set of rules. (Chung and Pullum, 2015). Specifically, English grammar involves eight parts of speech, namely: noun, pronoun, adjective, verb, adverb, conjunctions, preposition, and interjections. These grammatical elements are being taught to the students for them to become competent (Sioco & De Vera, 2018). Furthermore, the rubrics of grammar, such as usage of auxiliary verbs, parts of speech, use of articles and word order for the expression of complex tenses, aspect and mood, as well as passive construction conditional sentences are needed for those who want to master the language and to enhance their English proficiency level (Chandra, 2016).

Furthermore, Kirkham (2010) encapsulates grammar as the rules of language. Still, how these rules are conceptualized and confined can differ from definition to definition. Consequently, the traditional discernment of grammar differs in precise but vital ways from the linguistic sense of the term. For linguists, grammar is important because it is the language that makes it possible to talk about language, but for many language teachers and learners, the importance of grammar is associated with the accurate use of language for effective communication (Ahangari & Barghi, 2012). In addition, Richards (2016) explains that grammar is the system of rules applied to construct sentences that point out the knowledge of parts of speech, tenses, phrases, clauses and syntactic structures. It is utilized to create grammatically correct sentences in English.

Meanwhile, Chandra (2016) underscored that one who is fluent, proficient, and accurate in English has the ability to speak or to express the language with enough structural accuracy and vocabulary to engage successfully about practical, social, and professional topics in both formal and informal conversation. This capacity can be gained by training, practice, and advancement to knowledge, skill, and competence. Hence, one who is knowledgeable in grammar is one who has mastered and can utilize these rules to express himself or herself in the acceptability of the language forms.

Grammar proficiency is an important aspect of any good writing composition. In addition, students can improve their English proficiency by producing written work that employs the grammatical structures they have learned. Although it is idealistic for nonnative students to expect to reach 100% accuracy, they should aim to continuously improve their writing proficiency in order to make their work as readable and efficient as possible. (Baleghizadeh & Gordani, 2012)

As far as competence is concerned, one of the language learning competencies in the K to 12 programs is connected with grammar proficiency. Evidently, the noticeable failure among students in their usage of correct grammar in the English language can be seen both in the elementary and in the secondary level of education. The learners are expected to master grammar competencies in the early stages since K to 12 uses spiral progression, which means that it is a prerequisite for them to handle the more advanced grammar lessons in the higher levels of their education (Sioco & De Vera, 2018).

Because Filipinos read, write, listen and speak English, they stood out from other ESL-speaking countries. This may have been the situation a decade ago, but it is no longer the same at present. This state is reflected in the different studies and other related research about the grammar proficiency of Filipino learners. In the study of Suarez, Añabieza, & Tagaytay (2016), with 400 participants, they found that the students from Davao had a low level of grammar proficiency (2016). The same result was found in the study conducted by Sioco & De Vera (2018). They found that 90.4 percent of Filipino respondents have an “Average” grammatical competence in the area of subject-verb agreement. And only 9.6 percent have gained the level “Moving towards Mastery.”

Furthermore, it supports the findings of Aboy & Manalo (2015), which revealed that the fourth-year Filipino students had an average level of grammar proficiency when they were taken as a whole was average in articles, nouns, pronouns, verbs, conjunctions, prepositions, and interjections and was low in adjectives and adverbs. When grouped by variables, their level of grammar proficiency was consistently average.

Additionally, the English language proficiency of freshmen students who are enrolled in the Institute of Teacher Education is described as Early Intermediate. These students can only make simple sentences in communicating basic and familiar ideas and can read and write short paragraphs on familiar topics that have a vocabulary and sentence structures taught previously. They usually commit errors in word usage, pronunciation, and grammar (Leyaley, 2016).

Learners' Autonomy and Grammar Proficiency

In line with this, researchers explore advanced ESL learners' ability to make improvements in grammatical accuracy by autonomously noticing and correcting their own grammatical errors. In the recent literature in SLA, it is suggested that classroom tasks can be used to foster autonomous language learning habits. Therefore, it is important to consider classroom tasks that encourage autonomous language learning behavior. In the study of Vivkers (2016), 13 advanced ESL composition students were engaged in a task in which they compared their own use of grammatical form in their own written output to the use of grammatical form as used in a text written by a native speaker.

Meanwhile, some other studies related to learner's autonomy and grammar proficiency found contradicting results. For example, Mangda (2015) found that the level of motivation and the English language proficiency test of the students was not found significantly related, which means that their desire to study English did not influence their proficiency test. Also, Ezzi (2018) also investigated students' level of learner autonomy and its relationship with their English proficiency. It was found that two variables are not significantly correlated, which indicates that the high or low level of English proficiency of the students doesn't mean that their learner autonomy will be high or low as well.

Furthermore, Zarei & Nasrin (2015) investigated the effect of EFL learners' proficiency level on their motivation and autonomy. 141 English major Iranian students participated in the study. To assess variables, they were asked to fill in two questionnaires on motivation and learner autonomy, Attitude/Motivation Test Battery (AMTB) and an autonomy questionnaire developed by Zhang and Li (2004) (45). The participants' proficiency level was examined using their scores on the Michigan Test of English Language Proficiency (MTELP). The collected data were analyzed using the Kruskal-Wallis procedure. Findings revealed that the students' language proficiency did not influence their motivation and autonomy. Hence, language proficiency was not an influential factor in students' motivation and autonomy.

Theory of Multiple Intelligence and Grammar Proficiency

During the last three decades, multiple intelligence (MI), proposed by Gardner (1983), has drawn considerable attention from researchers. The theory of MIs has always been a controversial view in language learning, and there have been many different views about the relationship between MIs and language learning (Zarei & Mohseni, 2012).

Gardner's view of intelligence can be seen as a starting point for teaching English in a way that is different from traditional, teacher-centered methods making use of only linguistic intelligence-friendly activities. Gardner's theory of multiple intelligences (MI) proposes a means of understanding how we process, learn, and remember information. His theory asserts that while individuals are capable of processing information in at least eight different ways, each individual varies in the degree of skill possessed in each of these bits of intelligence. He identifies eight categories of skills and abilities which he considers to be individual bits of intelligence: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal and intrapersonal and naturalistic. He believes that these discrete abilities operate together in complex ways and provide a much more comprehensive view of what constitutes human intelligence. Hence, MI Theory can be a means to address students' diverse bits of intelligence by creating individualized learning environments. (Elgün-Gündüz & İsmail, 2016).

MI Theory has been one of the bases in language learning in the classroom for many researchers. One of these is the of Haley (2004), as cited by Derakhshan & Maryam (2015), where it was found that students achieved greater success rates when the MI theory was implemented. Moreover, the study of Mulyaningsih, Rais, & Sulistyawati (2012) verified the correlation between grammatical competence and verbal-linguistic intelligence toward writing ability, with 30 students as the sample. The data was analyzed using Linear Regression Analysis Statistics by using SPSS 16. Findings show that there is a positive correlation between grammatical competence and verbal-linguistic intelligence toward writing ability. Hence, grammatical competence and verbal-linguistic intelligence contribute to writing ability.

In addition, Sadeghi and Farzizadeh (2012) figured that the components of MI had a significant correlation with writing ability. After a year, another study from Salem's (2013) verified the effectiveness of MI-based instruction on developing the speaking skill of the pre-service teachers of English language classrooms. These results inferred that In the ESL and EFL classrooms, it is feasible to encourage learners through different activities related to different bits of intelligence.

On the other hand, a number of related studies revealed results contrary to the findings of the above-mentioned systematic investigations. For instance, Sogutlu & Sogutlu (2018) found that there is a moderately significant negative relationship between bodily intelligence and interpersonal intelligence and their success in grammar. Also, it was revealed that there is no relationship between students' success in grammar and their linguistic, logical, spatial, musical, intrapersonal and naturalistic bits of intelligence. Pearson correlation analysis was conducted to investigate possible relationships between these variables. It was concluded that there was no relationship between overall MI and students' achievements in grammar, vocabulary and writing. The results also show that overall MI does not correlate with students' performance in grammar, vocabulary or writing. In comparison, a negative correlation was found between learners' bodily-kinesthetic intelligence and interpersonal intelligence and their success in grammar. Finally, no relationship was detected between the other MI components and learners' success in vocabulary and writing.

As Zarei & Mohseni (2012) examined the intelligence types that learners apply in connection to their ESL and EFL learning, it was concluded that no single teaching technique could best suit all types of learners since they will experience different success no matter how they are taught. However, in an effort to understand learner-centered instruction from the perspective of MI, Saricaoglu and Arikan (2009) emphasized that the purpose of second language teachers' action was to investigate the use of MI theory in designing instructional strategies, development of curricula, and alternative forms of assessment and evaluation with ESL learners.

Methodology

This study is quantitative research by design since it focused on the characteristics of the chosen group of individuals and their behavioral patterns and perception. A descriptive survey was utilized to identify the learners' autonomy, multiple intelligences, and grammar proficiency. To determine the learners' autonomy, a scale of 1 to 5 was used in which the lowest value is 1, and the highest is 5. To determine the multiple intelligence of the respondents, the respondents were asked to rank the statement from 1 to 9, in which the lowest mean score is the learner's most preferred type of intelligence. Furthermore, to measure the grammar proficiency of the learners, a 75-item English Proficiency Test was administered. Upon the consolidation and checking of the responses, the data gathered were computed. Then, a correlation was utilized. It is a type of nonexperimental research where two variables are measured and assessed to identify their statistical relationship. In this study, the researchers identified the relationship between the learners' autonomy and multiple intelligences with their grammar proficiency.

Results and Discussions

Table 1 exhibits the summary of dimensions of the learners' autonomy based on cognitive ability, affective factors, Metacognitive Strategies, and social factors. Results from the survey show the cognitive ability of the respondents, which are the dimension 1 readiness for self-direction with 4.0 mean score and dimension 5 Language Learning Activities outside the class with 3. 69 mean score has an average mean of 3.84. Meanwhile, affective factors, including the dimension 8 assessment/ motivation with a mean score of 3.63 and dimension 7 intrinsic motivation with a mean score of 4.0, have an average mean score of 4.0. Furthermore, meta-cognitive strategies, including dimension 2 independent work in a language with a mean score of 3.83 and dimension 6 selecting content with a mean score of 3.56, have an average mean of 3.70. Finally, social factors include dimension 3 importance of class/teachers with 3.64, dimension 4 roles of the teacher: explanation/supervision with a mean score of 4.22, and dimension 9 interest in other cultures with a mean score of 3.65 has an average mean of 3.84. Based on these above-mentioned data, the majority of learners' autonomy is more inclined with their cognitive ability and social factor.

Table 1. Summary of Dimension of the Learners' Autonomy

Reference	Dimension	Mean Score
Cognitive Ability	Dimension 1 Readiness for Self-direction	4.0
	Dimension 5 Language Learning Activities Outside the class	3.69
	Average Mean	3.84
Affective Factors	Dimension 8 Assessment/ Motivation	3.63
	Dimension 7 Intrinsic Motivation	4.0
	Average Mean	3.81
Meta-Cognitive Strategies	Dimension 2 Independent Work in Language	3.83
	Dimension 6 Selecting Content	3.56
	Average Mean	3.70
Social factor	Dimension 3 Importance of Class/Teacher	3.64
	Dimension 4 Role of Teacher: Explanation/Supervision	4.22
	Dimension 9 Interest in Other Cultures	3.65
	Average Mean	3.84

Table 2 presents the mean score of the summary of the intelligence of the learners. Results from the survey show that bodily-kinesthetic has a mean score of 11.80; existential has 11. 32 mean score; interpersonal has 13.61 mean score; intrapersonal has 13.16 mean score; logic has 14.31 mean score; musical has 15.39 mean score; naturalistic has 17.35 mean score; verbal has 19.15 mean score; and visual has 17.89 mean score. Based on the administered test, it was found that only 15% of students prefer the kinesthetic style for their learning. Based on the gathered data, it can be concluded most of the respondents' intelligence is inclined more on existential and bodily-kinesthetic.

Table 2. Summary of Mean Score of the Multiple Intelligences of the Learners

Dimension	Mean Score
Bodily kinesthetic	11.80
Existential	11.32
Interpersonal	13.61
intrapersonal	13.16
logic	14.31
musical	15.39
Naturalistic	17.35

verbal	19.15
visual	17.89
My most preferred MI Area	Existential
(My Lowest score)	11.32
My second most preferred MI Area	Bodily-Kinesthetic
(My next lowest Score	11.80

Table 3 presents the frequency and percentage distribution of the grammar proficiency of the profile of the learners (N=379). Based on the data, 7 out of 379 respondents scored 61 to 75, which means 1.8 percent of them are highly proficient; 114 scored 46 to 60, which means 30.1 percent are advanced Proficient learners; 109 scored 36 to 45, which means 28.8 percent are proficient; 70 scored 26 to 35 which means 18.5 percent are emerging proficient, and 79 scored 1 to 25 which means 20.8 percent are below proficient. Given the above-mentioned data, it only shows that most of the respondents are in advanced proficient level with the highest mean percentage of 30.1.

Table 3. Frequency and Percentage Distribution of the Grammar Proficiency of the Profile of the Learners

Score	Interpretation	Frequency	Percent
Highly Proficient	61 to 75 score	7	1.8
Advanced Proficient	46 to 60 score	114	30.1
Proficient	36 to 45 score	109	28.8
Emerging Proficient	26 to 35 score	70	18.5
Below Proficient	1 to 25 score	79	20.8
	Total	379	100%

Table 4 shows the relationship between the learners' autonomy and their grammar proficiency. Based on the result of the analysis, the p-value is 0.000, which indicates a strong significant correlation between Learners' Autonomy and Grammar Proficiency.

Table 4. Summary of Mean Score of the Multiple Intelligences of the Learners

Model	B	Std Error	Beta	T	Sig.
(constant)	34.509	4.095		8.427	0.000
Readiness for Self -Direction	5.042	1.675	0.256	3.010	0.003
Independent work in language learning	0.903	1.480	0.049	0.610	0.542
Importance of Class/Teacher	-9.514	1.401	-0.479	-6.790	0.000
Role of Teacher Explanation	1.198	1.200	0.067	0.998	0.319
Language Learning Activities	-0.199	1.114	-0.012	-0.179	0.858
Selecting Content	0.339	1.026	0.022	0.330	0.741
Intrinsic Motivation	3.082	1.107	0.198	2.785	0.006
Assessment & Motivation	-2.370	1.298	-0.124	-1.827	0.069
Interest in other Cultures	1.293	0.950	0.088	1.361	0.174

R = 0.501
R^2 = 0.251
F-Value = 13.757
p-value of 0.000
Alpha = 0.05

a. Dependent Variable: Grammar Proficiency

b. Predictors: (Constant), Interest in other Cultures, Role of Teacher Explanation, Selecting Content, Assessment & Motivation, Intrinsic Motivation, Language Learning Activities, Importance of Class/Teacher, Independent work in language learning, Readiness for Self-Direction

Conclusion and Recommendations

Based on the findings gathered in this study, the following conclusions were drawn.

1. Learners tend to use more of their cognitive ability and social factors in autonomous learning.
2. The majority of the learners is more inclined with existential and bodily-kinesthetic intelligence
3. Learners' grammar proficiency is at an advanced proficient level.
4. Learners' Autonomy significantly affects their grammar proficiency which indicates that the null hypothesis is rejected.
5. Learners' multiple intelligences significantly affect their English proficiency, which also indicates that the null hypothesis is rejected.
6. Finally, this study suggests implications on the improvement of grammar instruction in relation to the application of learners' autonomy and Multiple Intelligence Theory inside and outside the classroom.

The following recommendation were drawn based on the conclusion of the study:

Teachers should plan and utilize strategies with activities that promote cognitive abilities and support cognitive development.

It is recommended that learning in the classroom should be interactive, inspirational, fun, challenging, and motivating. Enough space should be provided for the learners' creativity, independence, interest, physical and psychological development

Finally, students' intelligence should be taken into consideration when designing activities in grammar lessons.

Acknowledgement

The researcher would like to express her deepest gratitude to her family, for their unconditional love and for being the researcher's source of happiness and motivation. Above all, the Almighty God, for giving her the physical, mental, emotional, and intellectual strength, for His great love and blessings, and for giving her the individuals who exerted effort and supported her in countless ways.

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Re-inventing Social Media: Its Effects on Students' Vocabulary Proficiency

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Abstract - This descriptive- developmental study was undertaken to determine the effect of social media on students' vocabulary proficiency. The respondents were 50 purposively chosen Grade 7 students of Kirayan National High School. To interpret the data gathered for this study, the researchers used Mean, Standard Deviation, Frequency, Percentage and Rank for descriptive analysis, and Kruskal Wallis Chi-square for inferential analysis. Based on the result, it was found out that among the top 5 commonly used social media platforms, Facebook ranked first. However, it was also revealed that although Facebook was commonly used, majority of these users were only sometimes exposed on this social media platform. Some of them were often exposed on YouTube, Messenger and Tiktok. In terms of vocabulary proficiency, Facebook users' vocabulary proficiency was average, while those of YouTube, Messenger and Tiktok users were high. Also, Kruskal Wallis Chi- Square result revealed that students` use and extent of exposure on social media platforms do not affect their vocabulary proficiency. Based on these results, it may be concluded that students had good vocabulary proficiency, yet this was not due to their exposure on social media platforms. Thus, to further enhance the vocabulary proficiency of students, an instructional material entitled "Interactive Vocabulary Enhancement Quiz (InterVEQ)," was developed. This can be used as a tool in developing student's cognitive skills specifically in vocabulary building and enhancement.

Keywords - Social media, Vocabulary proficiency, Re-inventing, Exposure, E-Learning

Introduction

Language is the core element of communication and English is the language used to communicate globally. English serves the purpose as a common language and a global language (Rao, 2019). It is the language of international communication, the media and the internet; hence, being proficient in English is very essential as it gives better opportunities and increases chances of getting careers.Vocabulary as one of the crucial component of language is important for students to understand others and to express their own ideas. Vocabulary can be defined as the words of a language, including single items and phrases or chunks of several words which convey a particular meaning, the way individual words do. Vocabulary studies draw on an understanding of lexis, the Greek term for word, which in English "refers to all the words in a language, the entire vocabulary of a language" (Barcroft, Sunderman, & Schmitt, 2011). Vocabulary addresses single lexicalitems—words with specific meaning(s)—but it also includes lexical phrases or chunks. Wilkins (1972) wrote that ". . . while without grammar very little can be conveyed, without vocabulary nothing can be conveyed". This point reflects that with different languages; even without grammar, with some useful words and expressions, one can manage to communicate and convey ideas. Teaching vocabulary helps students understand and communicate with othersin English. Particularly as students develop greater fluency and expression in English; it is significant for them to acquire more productive vocabulary knowledge and to develop their own personal vocabulary learning strategies.

The use of technology has become an important part of learning and it greatly contributed to the learning and teaching process. According to Bull and Ma (2001), technology provides and offers unlimited resources to language learners. Application of technology helps learners learn on the basis of their interests and it also satisfies both visual and auditory senses of the learners. According to Lam and Lawrence (2002) and PourhoseinGilakjani (2017), technology assists learners in adjusting their own learning process and they can have access to a lot of information that their teachers are not able to provide. With the emergence of technology, one of its features is to be able to access social media platforms which are the most in demand portals used by people for their specific needs and intention. Some of its functions include social networking or allowing people to connect with each other, blogging or posting short stories, opinions or entries on social network sites or websites, photo and video sharing or publishing user's digital photos and videos. The purpose of social media platforms are not just for communication and sharing of contents alone, social media could also be used as a supplementary tool for literacy development.

It is usually observed that students are bored of reading and writing and following a number of studies.The major factor that students frequently cite as the cause of their boredom at school is that the materials are not always interesting or relevant. Some other bored students, however, indicate that the source of their boredom is mainly due to a lack of interaction with their teachers. In fact, experience has shown that instructional methods that involve working and learning with peers are the most highly rated of all the instructional methods that teachers use, (Yazzie-Mint, E. 2010). To counter classroom boredom and enhance behavioral engagement, social media tools could be used to design learning activities that are both social and interactive (e.g. discussion, debate, group projects, etc.). This would enable students to learn from each other and interact with other people beyond the school walls. The internet and social media provide plenty of online informations which often students are more inclined to read, especially of these pieces of information includes eye-catching graphics. Online messages, comments, news articles and books provide an endless list of information thus, students are motivated to devote their time and put some extra effort in learning. Such online activities contribute to their learning and eventually help them to develop stronger reading habits which results them to acquire more vocabulary. Social media sites are interactive and this definitely keeps the students involved, and especially that student uses social media most of the time such as Facebook, Twitter, Instagram, Tiktok and etc. Thus, it is in this regard that the researchers came up with thestudy,"Re-inventing Social Media: It`s Effect on Students` Vocabulary Proficiency" to gauge students' exposure on social media and its effect on their vocabulary proficiency.

Methodology

Research Design. This study used descriptive developmental research. Descriptive method emphasizes objective measurements and the analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computation techniques. Furthermore, descriptive data is more on answering the question "what" and the characteristics used to describe the situation. On the other hand, developmental method pertains directly to instructional development, which means an output will be developed after the conduct of the study.

Respondents. The respondents of the study were the 50grade the 7 students of Kirayan National High School. Purposive sampling was used in choosing the said respondents.

Materials and Instrumentation. The study used a Researcher-made questionnaire; part 1 consists of questions on extent of exposure of the students in utilizing social media; part 2 consists of various types of questions that tests the level of proficiency of the students in vocabulary while utilizing different social media platforms. The questionnaire undergone content and face validation among experts.

Data Gathering Procedures. The researchers sent a letter to the school principal of Kirayan National High School asking permission to conduct the study. After the permission was approved, the questionnaires were handed personally to the council adviser of grade 7 students and they distributed it along with their modules. The data collection was done after the respondents responded to the survey. After which, the results were collected and tallied, and the data was used in the study. The respondents were assured that their answers would be kept confidential. Finally, the development of the instructional material was crafted based on the result of the study.

Data Gathering Techniques. For descriptive data analysis, the researchers used Mean, Standard Deviation, Frequency, Percentage and Rank in analyzing data gathered from the survey. Moreover, a 5-point Likert Scale was used to determine the range of the students' vocabulary proficiency.

Below shows the 5- point Likert Scale of the mean and its corresponding description.

5- point Likert Scale for Vocabulary Proficiency

Range of Means	**Descriptive Rating**
40.21- 50.00	Very High
30.41- 40.20	High
20.61- 30.40	Average
10.81-20.60	Low
1.00- 10. 80	Very Low

For inferential data analysis, Kruskal Wallis Chi-square was used to determine if there are statistically significant differences between students' vocabulary proficiency and extent of exposure on different social media platforms.

Results and Discussions

Descriptive Result
Table 1.Commonly Used Social Media Platforms by Grade 7 Students

Social Media Platforms	F (n)	%	Rank
Facebook	38	76%	1st
YouTube	7	14%	2nd
Messenger	3	6%	3rd
Tiktok	2	4%	4th
Total:	50	100%	

Table 1 shows the commonly used social media platforms by Grade 7 students. The data revealed that majority of grade 7 students commonly used Facebook with a percentage of 76% users. This was followed by YouTube with 14% users, messenger with 6% users and tiktok with 4% users. The result implies that most respondents prefer to use Facebook more than other social media platforms.

Table 2. Grade 7 Students' Extent of Exposure in Commonly Used Social Media Platforms

Social Media Platforms			Extent of Exposure							
			Always		Often		Sometimes		Rarely	
	f	%	f	%	f	%	f	%	f	%
Facebook	38	76%	10	20%	6	12%	13	26%	9	18%
YouTube	7	14%	1	2%	2	4%	1	2%	3	6%
Messenger	3	6%	2	4%			1	2%		

Tiktok	2	4%	1	2%					1	2%
Total	50	100%								

Table 2 presents the Grade 7 students' extent of exposure in commonly used social media platforms. As shown on the data, Grade 7 students' extents of exposure vary. As for Facebook, the result shows that 10 or 20% of users were always exposed on Facebook, 6 or 12% were often exposed, 13 or 26% were sometimes exposed and 9 or 18% were rarely exposed. For YouTube, 1 or 2% were always exposed, 2 or 4% were often exposed, 1 or 2% were sometimes exposed and 3 or 6% were rarely exposed. In terms of messenger, 2 or 4% users often exposed in this social media platform, and only 1 or 2% were sometimes exposed. Finally, for tiktok, only 1 or 2% was always exposed, and also 1 or 2% was rarely exposed. The result signifies that, although most respondents chose Facebook as their commonly used social media platform, they were not always exposed to the said social media.

Table 3. Respondents' Vocabulary Proficiency When Grouped According to Commonly Used Social Media Platforms

Social Media	M	(SD)	Description
Facebook	**28.95**	**(10.35)**	**Average**
YouTube	**35.14**	**(8.24)**	**High**
Messenger	**32.00**	**(6.08)**	**High**
Tiktok	**32.00**	**(12.73)**	**High**

Table 3 shows the vocabulary proficiency of Grade 7 students when grouped according to social media platforms. As revealed, Facebook user's vocabulary proficiency was found out to be "average" (M= 28.95, SD= 10.35). On the other hand YouTube, messenger and tiktok users had "high" vocabulary proficiency (M= 35.14, SD= 8.24; M= 32.00, SD= 6.08, M= 32, SD= 12.73).

The result of this study may prove the claim in the study of Zainal and Rahmat, (2020) about social media and its influence on vocabulary and language learning. The vocabulary skills section of the study indicates that respondents obtained new words from the use of social media. Many agreed they are exposed to new vocabulary via social media.

Inferential Result

Table 4. Kruskal Wallis Chi Square Result on the Significant Difference in Respondents' Vocabulary Proficiency when Grouped According to Social Media Platforms

Variables	M Rank	$H_{(50,3)}$	P	Remarks
Social Media		2.758	.430	Not significant
Facebook	23.72			
Youtube	27.17			
Messenger	29.50			
Tiktok	33.29			

*p=0.05 level of significance

Table 4 presents the Kruskal Wallis Chi Square result on significant difference in respondents' vocabulary proficiency when grouped according to social media platforms. The data revealed that there is no significant difference in respondents' vocabulary proficiency when grouped according to social medial platforms since the p- value (.430) is higher than .05 level of significance. Therefore, the null hypothesis which states that there is no significant difference is not rejected. Moreover, this implies that students' use of social media platforms does not affect their vocabulary proficiency.

The result of this study is in contrast with the study of Monica(2014)which showed that students improved in vocabulary performance and confidence (even if slightly) after being exposed vocabulary via Facebook as compared to the case of students benefitting from traditional instruction only.

Table 5. Kruskal Wallis Chi Square Result on the Significant Difference in Respondents' Vocabulary Proficiency when Grouped According to Extent of Exposure on Different Social Media Platforms

Variables	M Rank	$H_{(50,3)}$	P	Remarks
Extent of Exposure		3.236	.357	Not significant
Always	27.00			
Often	27.69			
Sometimes	28.30			
Rarely	19.31			

*p=0.05 level of significance

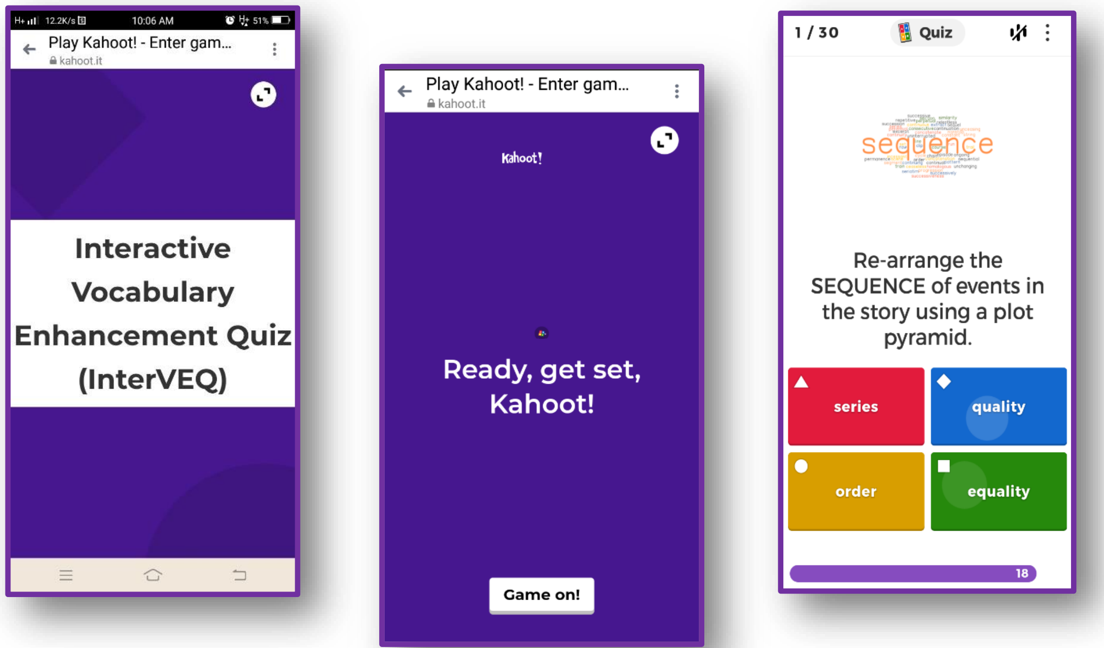
Table 5 presents the Kruskal Wallis Chi Square result on significant difference in respondents' vocabulary proficiency when grouped according to extent of exposure on different social media platforms. The data revealed that there is no significant difference in respondents' vocabulary proficiency when grouped according to extent of exposure on different social medial platforms since the p- value (.357) is higher than .05 level of significance. Therefore, the null hypothesis which states that there is no significant difference is not rejected. Moreover, the result also shows that respondents' extent of exposure in social media platforms does not affect their vocabulary proficiency.

This result is in contrast to the study of Kurniawan(2018) about the role of social media towards the English vocabulary acquisition of the students of Semarang University in which it revealed that in terms of the correlation between social media and English skills improvement, 31 students of the tenth 87 grade class and 27 students of the eleventh grade class agree that social media helps them in developing their English skills, while the rest of them are either not stating or disagreeing with the statement. This situation also happened to the students' vocabulary acquisition, where most of them stated that social media improve their English vocabulary.

With these foregoing results of the study which shows that respondents are exposed to social media, specifically Facebook, an e- learning material entitled "Interactive Vocabulary Enhancement Quiz (InterVEQ) was created to help enhance the students' vocabulary proficiency while engaging in Facebook as a social media platform. This maximizes the use of social media which is not only for posting and communicating, but also as an instrument in building students' knowledge.

Output

Interactive Vocabulary Enhancement Quiz (InterVEQ)

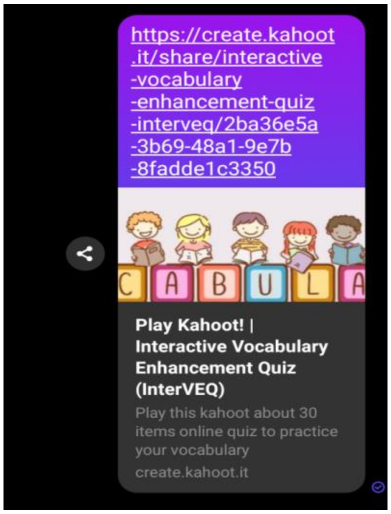


Introduction

Technology makes the world modernized, Facebook as one of the most commonly used social media platform by Grade 7 students led researchers to come up with an output which is an online instructional material entitled, “Interactive Vocabulary Enhancement Quiz (InterVEQ)” to help enhance the students’ vocabulary proficiency. This output was created through the use of Kahoot application andit is consist of 30-item vocabulary proficiency test.The test items used were taken from the researchers’ self-made questionnaire. These items were the ones that respondents had wrong responses/ answers. In addition, this E-Learning material can be accessed by anyone using Facebook or Messenger.

Description

InterVEQ is a 30- item online quiz to practice and develop students` vocabulary. Each item has a time limit depending on the difficulty of the items; easy items has 20 seconds limit while difficult items has 30 seconds limit. This type of e-learning activity can be played in many ways: Students can either play alone or do the challenge with their friends or classmates. To access the game quiz, go to the page of Interactive Vocabulary Enhancement Quiz (InterVEQ) on Facebook and find the link of the game quiz. If you received the link via Facebook messenger, click the link to access the game quiz. Sign up using your Facebook account or Google account; choose a way to play the quiz, tap “Game on”, enter your name that you want to appear on the screen and play.



How to access InterVEQ?
Click the link provided and then tap "play". The quiz begins once you click the game on. Read the questions carefully and choose the correct answer. Click "next" to continue playing.

Conclusion and Recommendations

Summary of the Findings

The main objective of this study was to find out whether Grade 7 students' exposure to social media affects their vocabulary proficiency. The researchers used Kruskal Wallis Chi-square to determine if there were statistically significant differences between students' vocabulary proficiency and extent of exposure on different social media platforms.The findings presented in this study revealed that there was no significant difference in respondents' vocabulary proficiency when grouped according to social media platforms. Additional findings revealed that there was no significant difference in respondents' vocabulary proficiency when grouped according to extent of exposure on different social medial platforms. This also signifies that respondents' extent of exposure in social media platforms does not affect their vocabulary proficiency.

Conclusions

Based on the result of the study, it may be concluded that learners nowadays, still prefer to use Facebook more than any other social media platforms. However, despite their exposure on this social media platform, their vocabulary proficiency is still not commendable. Thus, it simply shows that their extent of exposure and usage of social media platforms do not affect their vocabulary proficiency. Moreover, even though social media platforms like Tiktok, Messenger, Youtube are popular, still, others do not prefer to use them.

Recommendations

The findings of the study helped the researchers prepare the following recommendations.

1. Teachers must be encouraged to be resourceful in making instructional materials. They can use social media platform as a means of delivering educational contents such as vocabulary exercises to enhance the vocabulary proficiency of the students.
2. Students should find means to continue widening their vocabulary.They can use interactive platforms such as social media to learn and engage with new vocabularies.
3. Curriculum makers should include social media platforms in integrating educational contents in the implementation of curriculum.
4. School Administrator must be encouragedthe use of technology and apply social media in improving and developing the curriculum to achieve its institutional goal. Additionally, practicing the

use of social media in delivering instructional materials to assess students` vocabulary is suggested.

5. Social media enthusiast can use their social media platform in sharing contents related to vocabulary learning and enhancement.
6. Future researchers should evenly distribute their survey questionnaires to come up with better and accurate results. They should conduct another study related to this in order for the next generation to be more exposed and familiar with new vocabularies. Future research should include more methods of gathering information, for instance include a bigger scale number of respondents from different background fields of study and include more universities or institutions.
7. Future studies also may come out with more accurate ways to gather data in order to support findings' validity and to create instructional materials that is beneficial to the next generation. Another area for future research would be collecting responses from high school students as they also are well exposed to internet and social media.

Acknowledgement

The researchers would like to extend their sincere gratitude to the following persons who have contributed and supported the proponents in the fulfillment of this study:

To the researchers` parents Mr. and Mrs. Eslita, Mr. and Mrs. Libo-on, Mr. and Mrs. Lozano, Mr. and Mrs. Taras, and Mr. and Mrs. Valentin, for the unending support morally, spiritually, and financially. To Mr. Jolky Balcuba, for allowing the researchers to perform their research in his house.

To Dr. Jureca F. Nacional, research coordinator, for the lecture and guidance towards the accomplishment of the study.

To Prof. Joann G. Muyong, research adviser, for the help critiquing the study as well as herwisdom and patience in rechecking and unending enthusiasm for the betterment and completion of the study.

To Prof. Lorelie Sabando, statistician, for the effort of providing and correcting the statistical result of this study. Thank you also for the patience especially in every question and managed to answer it with whole understanding to the researchers.

To Dr. Maja Jade N. Perez, grammarian, for her forbearance, consideration, and reinforcement in attaining better study.

To Dr. Loriedee D. Bentula, panel member, for her insightful comments and suggestions towards the betterment of the study.

To Dr. Herminia N. Falsario, Dr. Ma. Salome R. Magbanua, and Dr. Shirley G. Frigillano, for checking and validating research questionnaires.

To Mr. Tomas S. Siva, Jr., School Principal of Kirayan National High School for the warm welcome prior to conducting the study.

To Mrs. Jenielyn, Grade 7 curriculum adviser, for accommodating and assisting the researchers in conducting the survey.

To Grade 7 Students of Kirayan National High School,for being cooperative and for lending their time in answering the research questionnaires.

Most especially, to God Almighty for being there with the researchers in their sleepless nights and hard work that made the journey all worth it; for playing a part of improving ourselvesand giving us immense knowledge and enlightenment in conducting this study. For motivation, encouragement and support from the people behind this success became a big part in the completion of this study. We offer this special thanks to all of you, for without you, this would not be possible. We cannot repay the efforts you`ve given to the researchers but we pray that God will return a thousand folds for the good things you have done.

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Mga Hamon sa Pagkatutong Modyular sa Edukasyong Bagong Normal ng mga Mag-aaral

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Abstrak - Malaman ang mga hamong kinakaharap sa edukasyong bagong normal ng mga mag-aaral sa elementarya na nasa ikaapat hanggang ikaanim na baitang at sekondaryang mag-aaral partikular na ang mga nasa ikapito hanggang ika-10 baitang sa mga paaralang pampubliko sa bayan ng Tigbauan, Iloilo, taong panuruan 2020-2021 ang pangunahing layunin ng pananaliksik na ito. Ang mga hamon ay tiniyak sa pamamagitan ng palarawang pag-aaral na ginamitan ng talatanungang ginawa ng mga mananaliksik. Ang 60 kabuuang mag-aaral ay kinuha mula sa elementarya (30) at sekondarya (30) na pinili sa pamamagitan ng quota sampling. Mean at Standard Deviation ang ginamit sa pag-aanalisa at pagbibigay interpretasyon ng mga resulta. Lumabas sa mga nalikom na datos na ang nangungunang hamon ay kakulangan ng oras sa pagsagot sa lahat ng modyul habang ang hamong may kadalian sa mga mag-aaral ay ang may mga tanong na kung saan ang sagot ay hindi makikita sa pagpipilian. Kung kaya't masasabing hindi napagtuunang-pansin ng mga kinauukulan o gumagawa ng modyul ang mga kahirapang haharapin ng mga mag-aaral sa pagkatutong modyular partikular ang oras sa pagtatakda ng dami ng gawain sa bawat aralin. Iminumungkahi ang puspusang pagpaplano at pagsasagawa ng muling ebalwasyon sa mga nilalaman at mga gawaing angkop sa pangangailangan at kakayahan ng mag-aaral sa bawat antas ng grado na nakapaloob sa bawat paksang-aralin.

Keywords - Hamon; Pagkatutong Modyular; Edukasyong Bagong Normal; Mag-Aaral

Panimula

Inilagay ang Pilipinas sa isang estado ng kalamidad sa ilalim ng Proklamasyon ng Pangulo blg. 929 s. 2020 matapos umusbong at lumaganap ang isang pandaigdigang kagipitan sa kalusugan ng publiko - ang pandemyang COVID-19. Ang pagsuspinde at pansamantalang pagsasara ng mga kumpanya, negosyo at pagpapatakbo ng negosyo ay nagkabisa. Limitado rin ang paggalaw ng mga tao, kalakal, at serbisyo sa loob at buong mga hangganan ng mga lugal. (De Jesus, 2020).

Isa sa mga pinakaapektadong larangan dulot ng COVID-19 ay ang sektor ng edukasyon. Hinarap ng Departamento ng Edukasyon ang hamon sa taong panuruan 2020-2021 sa pamamagitan ng Basic Education Learning Continuity Plan(BE-LCP) sa ilalim ng DepEd Order No. 012, s.2020 (Tibon, 2020).

Ang mga paaralan ay naging pinakamahirap sa kaligtasan at seguridad. Nababahala ang mga alalahanin sa kalusugan ng mga tauhan ng paaralan, mag-aaral, magulang, at iba pang mga stakeholder; samakatuwid, ang pansamantalang pagsasara ng mga paaralan ay ipinatupad upang maglaman ng pagkalat ng virus at mabawasan ang mga impeksyon (UNESCO, 2020).

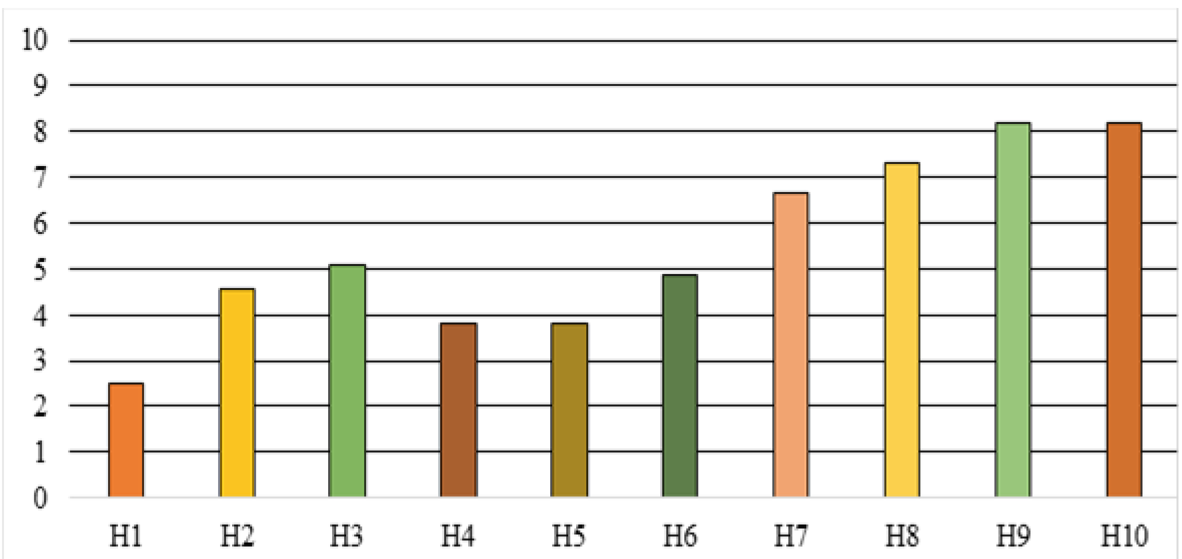
Kaugnay nito, ipinatupad ng Departamento ng Edukasyon ang Modular Distance Learning, para sa pagpapatuloy ng edukasyon at para sa bawat paaralan na makamit pa rin ang misyon at bisyon na magbigay ng de-kalidad na edukasyon sa bawat Pilipinong mag-aaral. Tulad ng pag-alok ng kurikulum, ang mga kakayahan sa pag-aaral ay na-decongest upang mag-focus lamang sa pinakamahalagang kakayahan sa pag-aaral na nakahanay sa pagkamit ng mga kasanayan sa ika-21 siglo tulad ng kritikal na pag-iisip, pakikipagtulungan, komunikasyon, at pagkamalikhain (DepEd Order Blg. 12, 2020).

Metodolohiya

Ang mga kalahok sa pag-aaral na ito ay ang mga mag-aaral sa elementarya na nasa ikaapat hanggang ikaanim na baitang at sekondaryang mag-aaral partikular na ang mga nasa ikapito hanggang ika-10 baitang sa mga paaralang pampubliko sa bayan ng Tigbauan, Iloilo, taong panuruan 2020-2021. Ang 60 kabuuang mag-aaral ay pinili sa pamamagitan ng quota sampling.

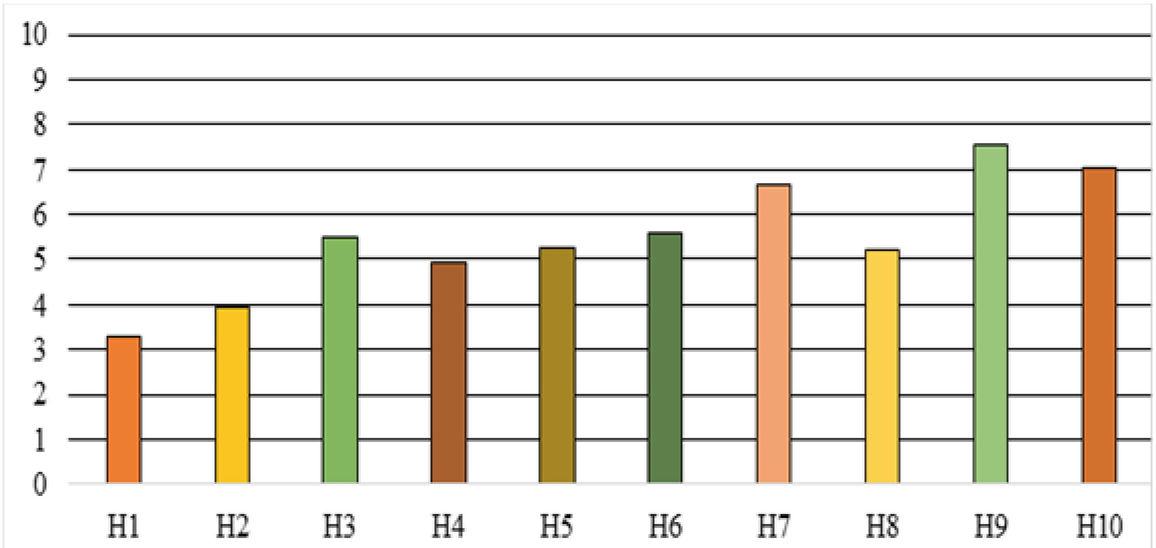
Ang mga mananaliksik ay gumamit ng talatanungan bilang patunay at mapagkukuhanan ng datos. Ito ay ipinasuri sa mga eksperto upang maging balido na gamitin. Ito ay binubuo ng dalawang bahagi. Ang unang bahagi ay ang mga personal na salik at ang ikalawang bahagi ay tungkol sa mga hamon sa pagkatutong modyular. Mula bilang 1-10, iraranggo ang mga hamon base sa pinakamahirap tungo sa pinakamadali. 1 ang pinakamahirap at 10 naman ang pinakamadali. Mean at Standard Deviation ang ginamit sa pag-aanalisa at pagbibigay interpretasyon ng mga resulta.
Resulta at Diskusyon

Manghad 1. Hamon sa pagkatutong modyular sa edukasyong bagong normal ng mga mag-aaral sa elementarya sa kabuuan



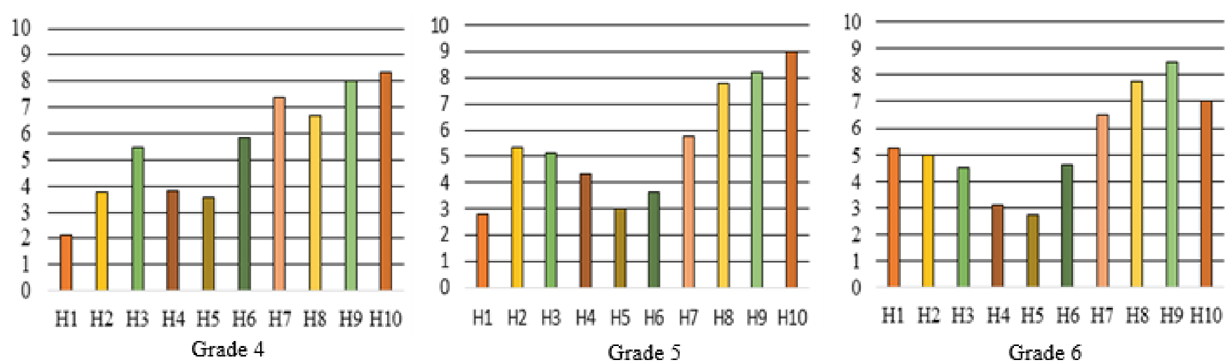
H1: Kakulangan ng oras sa pagsagot sa lahat ng modyul
H2 : Hindi masyadong naiintindihan ang nilalaman ng modyul
H3 : Hindi malinaw ang mga nakaimprentang mga letra sa modyul
H4: May mga gawaing hindi magawa sapagkat ang mga larawan ay malabo o naka- black and white
H5: Walang suporta sa mga magulang sa pagsagot ng mga gawain sa modyul dahil may trabaho
H6: May mga gawain na nangangailangan pa ng gamit o tulong ng teknolohiya
H7: Walang awtentesidad sa natutunan dahil kalimitan ay ang nanay ang nagsasagot o di kaya ay ng mga kapatid
H8 : Nakakatamad magsagot lalo na kung wala kang naiintindihan dahil walang gabay ng guro
H9 : May mga tanong na kung saan ang sagot ay hindi makikita sa pagpipilian
H10 : Pagkakaroon ng maraming distraksyon mula sa

Manghad 2. Hamon sa pagkatutong modyular sa edukasyong bagong normal ng mga mag-aaral sa sekondarya sa kabuuan

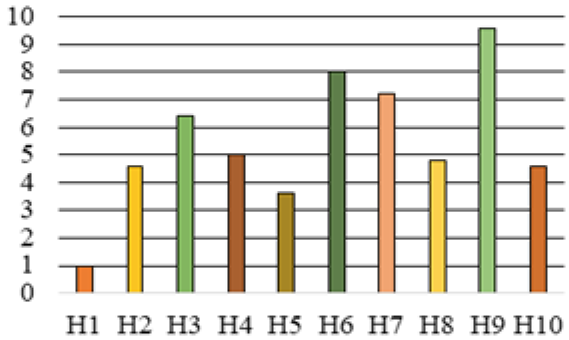


Sa kabuuan, kakulangan ng oras sa pagsagot sa lahat ng modyul, ang naging pinakamahirap na hamon ng mga mag-aaral sa elementarya at sekondarya.

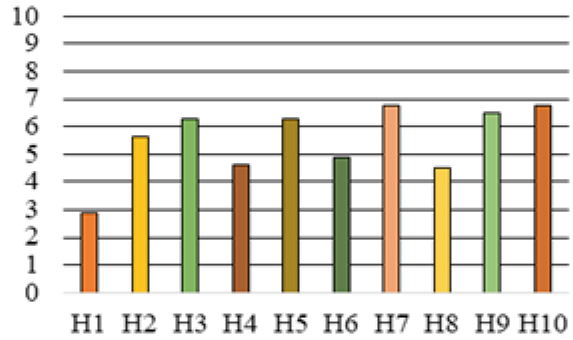
Manghad 3. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa elementarya kung ipapangkat ayon sa antas ng grado



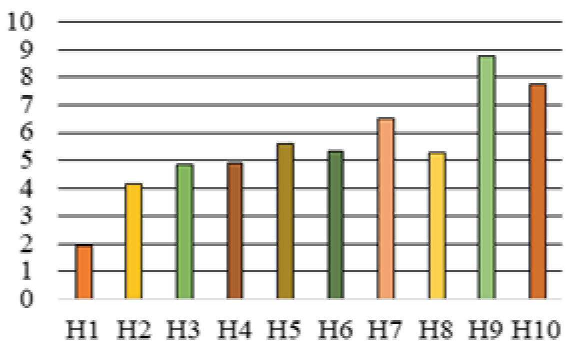
Manghad 4. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa sekondarya kung ipapangkat ayon sa antas ng grado



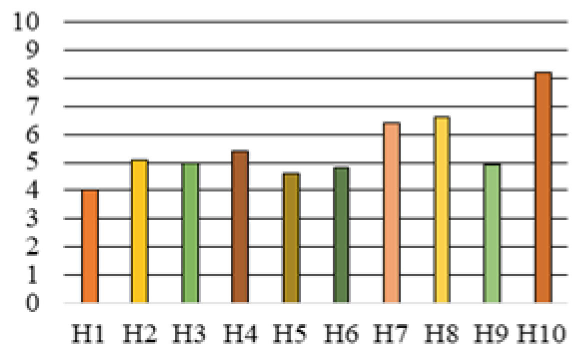
Grade 7



Grade 8



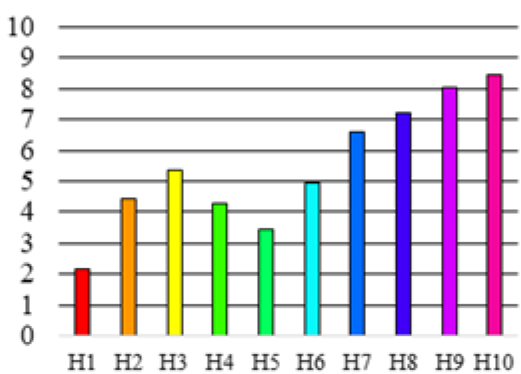
Grade 9



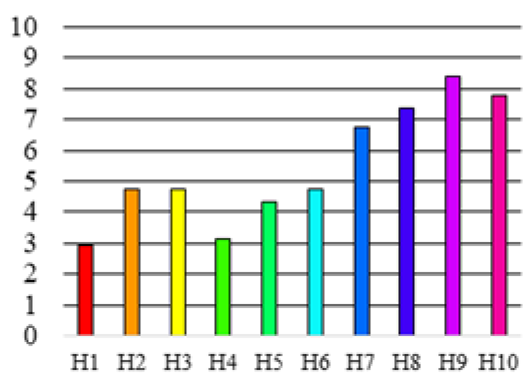
Grade 10

Gayunpaman, magkatulad ang hamon na naranasan ng mga mag-aaral sa antas elementarya at sekondarya, kakulangan ng oras sa pagsagot sa lahat ng modyul, maliban sa mga mag-aaral sa ika- 6 na baitang na nangingibabaw na pangunahing hamon ay ang walang suporta sa mga magulang sa pagsagot ng mga gawain sa modyul dahil may trabaho.

Manghad 5. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa elementarya kung ipapangkat ayon sa kasarian

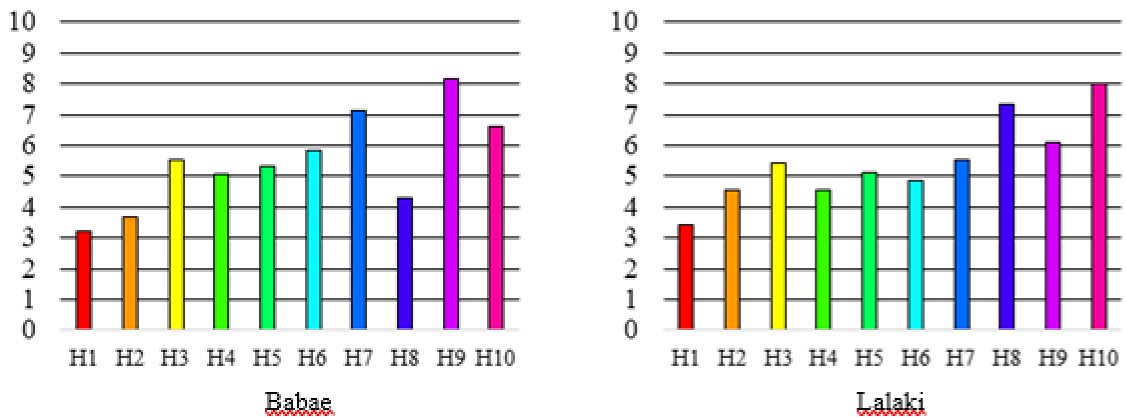


Babae



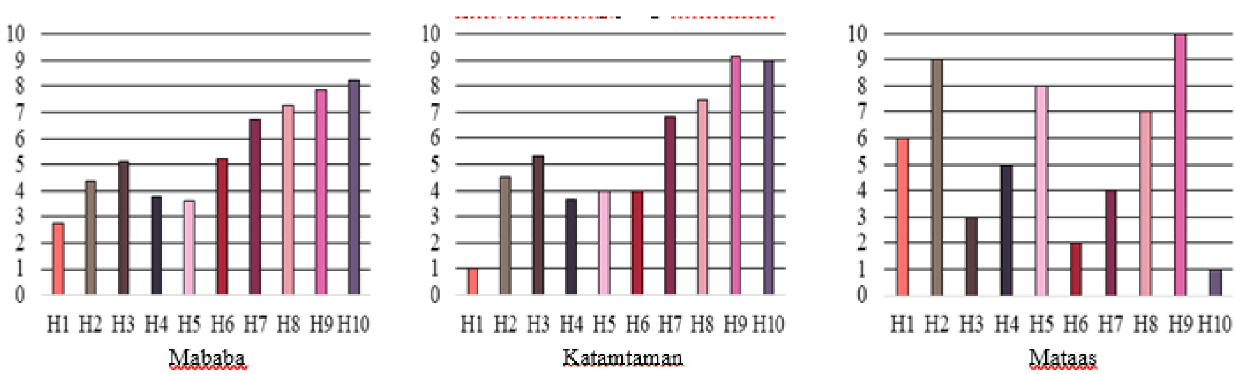
Lalaki

Manghad 6. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa sekondarya kung ipapangkat ayon sa kasarian

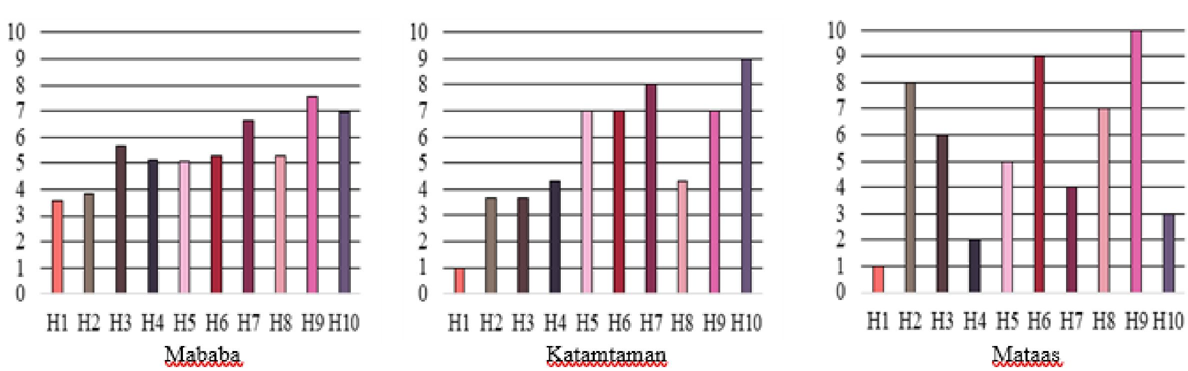


Ang resulta ay nagpapakita na anuman ang kasarian, nasa elementarya man o sekondarya ay parehong nahihirapan ang mga mag-aaral dahil sa kakulangan ng oras sa pagsagot sa lahat ng modyul.

Manghad 7. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa elementarya kung ipapangkat ayon sa istadong pang-ekonomiko

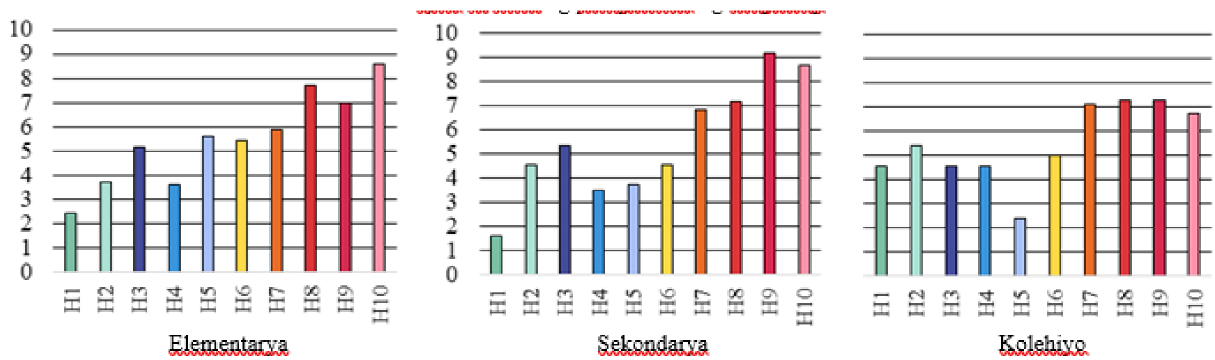


Manghad 8. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa sekondarya kung ipapangkat ayon sa istadong pang-ekonomiko

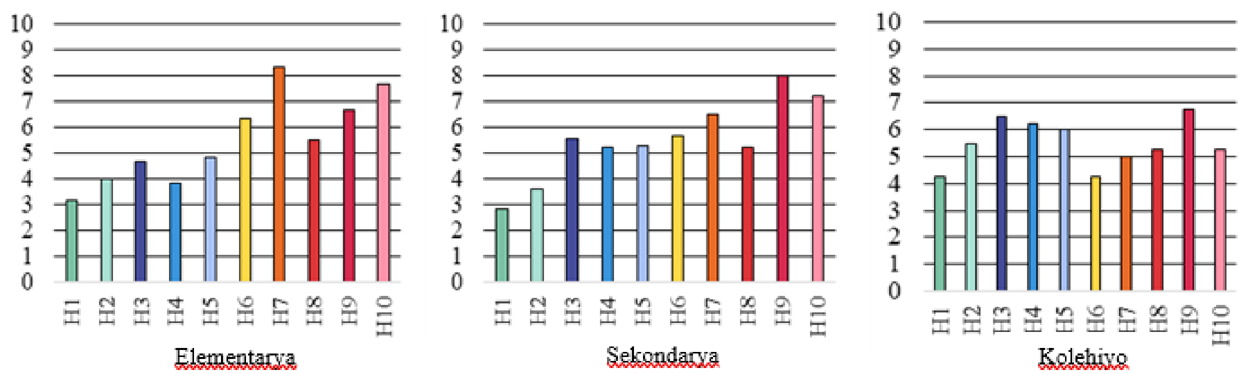


Sa kalagayan ng pamumuhay makikitang kakulangan ng oras sa pagsagot sa lahat ng modyul, pa rin ang pinakamatinding hamon ang matatagpuan sa dalawang lebel ng pag-aaral, bukod tangi ang mataas na antas ng pamumuhay sa elementarya, kung saan pagkakaroon ng maraming distraksyon mula sa paligid ang naranasang pinakamahirap na hamon.

Manghad 9. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa elementarya kung ipapangkat ayon sa antas ng pinag-aralan ng magulang



Manghad 10. Hamon sa pagkatutong modyular sa Edukasyong Bagong Normal ng mga mag-aaral sa sekondarya kung ipapangkat ayon sa antas ng pinag-aralan ng magulang



Matutunghayan sa resulta, na anumang antas ang pinag-aralan ng magulang, pareho pa ring kakulangan ng oras sa pagsagot sa lahat ng modyul, ang naging hamon sa mga mag-aaral, natangi sa lebel ng elementarya kung saan ang mga may magulang na nasa antas kolehiyo ay walang suporta sa mga magulang sa pagsagot ng mga gawain sa modyul dahil may trabaho ang naging hamon nila.

Kongklusyon

Matutunghayang, di nabigyang-pansin ng mga kinauukulan o gumagawa ng modyul ang mga kahirapang haharapin ng mga mag-aaral sa pagkatutong modyular partikular ang oras sa pagtatakda ng dami ng gawain sa bawat aralin. Bagama't ginawa lahat ng mga namamahala sa sektor ng edukasyon na matugunan at maipagpatuloy ang klase sa kabila ng krisis dala ng pandemya sa pamamagitan ng pagkatutong modyular, posibleng nakaligtaang isipin na limitado ang paggabay ng guro sa mga aralin.
Masasabing nakaligtaang bigyan ng pansin ng mga kinauukulan na maraming asignaturang haharapin ang mga mag-aaral. At ang bawat asignatura ay nahati sa iba't ibang yunit at ang bawat yunit ay maraming aralin at napapaloob sa bawat aralin ang maraming gawain. Dahil dito, naging malaking dagok sa mga mag-aaral ang sitwasyon ito sa iba't ibang grado, elementarya man o sekondarya.

Sa kabilang dako, maaaring dala ng matinding pangangailangan, kapos ang oras ng mga magulang sa pagsubaybay sa pag-aaral ng mga anak sa pag-aakala siguro ang mga nasa ika-6 na baitang na mga estudyante ay kaya ng mag-aral mag-isa.

Maliban sa maraming gawain sa modyul, maaring naging dahilan ay ang paraan ng pagkatuto at pag-uugali mismo ng mga mag-aaral tulad ng kakulangan ng disiplina sa sarili. Lantad ang pagkahumaling sa gadyet ng mga mag-aaral, mapa-bababe man o lalaki, malaki ang posibilidad na naging dahilan ito upang mawalan ng pokus sa mga gawain. Mapapansing mas pinaglalaanan ng oras ng mga kabataan ang social media kung kaya't ang resulta nito ay madalas silang magkraming kapag malapit na ang itinakdang oras sa pagpasa ng mga gawain.

Dala ng kahirapan sa buhay ang posibleng dahilan ng kakulangan sa oras na tapusin ang modyul. Kung saan hindi magabayan nang mabuti ng mga magulang ang mag-aaral sa elementarya dahil sa paghahanap ng ikabubuhay. Sa antas sekondarya naman, baka nahahati ang oras ng mag-aaral sa pagtatrabaho upang makatulong sa pamumuhay.

Sa ganang mataas na antas ng pamumuhay sa elementarya, maaaring ang distraksyon mula sa paligid ay ang mga gadyet sa loob ng bahay. O di kaya'y dahil sa maykaya at maraming kinaaaliwan sa paligid, naging dahilan ito na hindi makapokus ang mag-aaral sa mga gawain.

Mapapansing masyado ngang marami ang mga gawaing nakapaloob sa modyul na siyang naging dahilan bakit kinukulang sa oras na tapusin ang mga gawain. Dahil mababa man hanggang sa may mataas na antas ng pinag-aralan ang natamo ng magulang, magkatulad ang hamong naranasan.

Sa kabilang banda, ang kawalan ng suporta ng mga magulang na nasa antas kolehiyo ay masasabing dala ng pagiging abala sa trabaho. Kadalasan, pagod na sa pagtatrabaho buong araw ang magulang. Bukod pa, pagdating ng bahay kinahapunan marami pang mga gawaing bahay ang dapat din asikasuhin.

Rekomendasyon

Para mga mag-aaral, sanayin ang sarili na pamahalaan nang wasto at matalinong paggamit ng oras upang matugunan ang hinihingi ng bawat asignatura, maipasa ang mga modyul sa takdang oras at maiwasan ang pagka-kraming.

Sa mga magulang, magsisilbing gabay ang pananaliksik na ito, na patnubayan at alalayan ang mga anak. Mahalaga ang pagbibigay-pansin sa mga gawaing pang-akademiko ng mga anak sa pamamagitan ng pag-alam at pakikinig sa mga suliranin, kahirapan at kasiyahan ng anak sa modyular na paraan ng pagkatuto.

Samantala, sa mga guro naman, mainam na makipag-ugnayan sa mga magulang sa pamamagitan ng teks at tawag, konsulta at pag-post ng mga update sa social media, upang matugunan ang pangangailangan at mga katanungan kaugnay sa gawaing pagkatuto ng mag-aaral. Iminungkahi rin na suriing mabuti ang nilalaman ng modyul lalo na ang mga gawain sa bawat aralin. Sa pamamagitan nito masisiguro ang pagiging epektibo ng pagkatuto ng mga mag-aaral sa paraang modyular. Tiyaking ang dami ng gawain ay matatapos sa itinakdang oras. Pagtuunang-pansin din ang kalagayan ng bawat mag-aaral sa panahon ng pandemya.

Sa mga tagapamahala ng paaralan, maglaan ng sapat na suportang pinansyal sa mga kagamitang kakailanganin ng mga guro sa pagbili ng mga gagamitin sa paggawa ng mabisa at may kalidad na mga modyul.

Sa mga tagagawa ng kurikulum, iminumungkahi ang puspusang pagpaplano sa mga nilalaman at mga gawain na nakapaloob sa bawat paksang-aralin. Suriin at tiyakin na taglay ng layunin ang (SMART)

Specific, Measurable, Attainable, Result-oriented at Time-bound. Inirerekomenda ang pagsasagawa ng muling ebalwasyon ng modyul upang masiguro na ang mga aralin at gawain ay angkop sa pangangailangan at kakayahan ng mag-aaral sa bawat antas ng grado. Marapat din na ang mga panuto sa bawat pagsasanay ay mailahad ng malinaw para sa ikauunawa ng mga mag-aaral.

Sa mga mananaliksik sa hinaharap, ang pananaliksik na ito ay maaaring maging gabay at batayan sa pagsasagawa ng puspusang pag-aaral kaugnay sa ganitong usapan sa sektor ng edukasyon.

Acknowledgement

Nais ng mga mananaliksik na ipaabot ang taos-pusong pasasalamat, at tunay na pagpapahalaga sa lahat ng tumulong upang maisakatuparan ang pag-aaral na ito sa anumang paraan. Ang tagumpay na ito ay bunga ng paghihirap at sakripisyo ng lahat.

Sa dinamikong administrador ng kampus, Dr. Sandra T. Examen, sa kanyang walang humpay na pagsuporta sa mga mananaliksik at pagpapanatili ng kaligtasan ng mga mag-aaral upang maisakatuparan ang pag-aaral na ito.

Sa butihing tagapayo ng mga mananaliksik, Dr. Genalyn L. Moscaya, sa walang sawang pagtulong, pagbabahagi ng kaniyang kaalaman at oras para sa ikakaganda at ganap na ikakatagumpay ng pag-aaral na ito.

Sa mga nagsilbing panelist na kinabibilangan nina Gng. Joenalyn P. Camposagrado bilang tagapangulo, Gng. Jenena C. Delfin at Engr. Joel M. Ferolino bilang mga katuwang na kagawad sa pagbibigay ng mga suhestiyon upang maisaayos at mapabuti ang pananaliksik.

Sa mga naging tagatugon ng isinagawang sarbey na naglaan ng kanilang oras sa pagsagot at pagbibigay impormasyon tungkol sa paksa ng pag-aaral.

Sa mga magulang ng mga mananaliksik, Gng. Rona at G. Nilo Abonales, Gng. Divina at G. Dionisio Bolo, Gng. Emily at G. Garry Dalisay,Gng. Luciana at G. Domingo Talaman, Gng. Ma. Lourdes at G. Demetrio Jabonete na walang sawang sumusuporta sa pinansyal, emosyonal, espiritwal na pangangailan at pagmamahal.

Higit sa lahat, sa Poong Maykapal na siyang nagbigay ng karunungan, lakas, inspirasyon at pagmamahal sa bawat mananaliksik upang ang pag-aaral na ito ay matpos ng matagumpay.

Maraming Salamat!

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Home Learning Engagement Of Students Under Modular Instruction

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Abstract - This study determined the home learning engagement of students under modular instruction and the academic performance of the intermediate learners of Abra State Institute of Sciences and Technology, Laboratory School, Main Campus. Specifically, it measured the relationship between the learner's related factors, their academic performance and the agreement between parents and teachers on the perceived problems encountered on print modular learning. It made use of the descriptive correlational method of research and a survey questionnaire was used in gathering data. The findings revealed that the parents' monthly income influences the academic performance of the learners. The level of engagement of pupils in-home learning tasks specifically time management had a significant relationship with the academic performances of the learners. The parents and teachers agreed that there are problems encountered with print modular learning. Parents, teachers, and school administrators must work together to respond to the challenges in home learning engagement of the learners this time of the pandemic.

Keywords - Home Learning; Modular Instruction; Academic Performance; Correlation

Introduction

As they say, education is the key to success. Through education one will be able to reach all or some of his dreams, to do things that give him satisfaction (e.g. travels, material things, properties, etc.), and to help improve the society we are in. But what makes an education an education? What are the means of educating an individual? What strategies and situations affect the education of individuals?

As educators, we were used to traditional teaching. Traditional teaching includes the use of a chalk and board. It is in a classroom setup wherein there is a face-to-face interaction between the learners and the educator. Learners go to school for education. Educators facilitate the teaching-learning process. They guide their learners with any of their queries. They are hands-on in transferring knowledge to their learners. But all of these changed when the pandemic began due to COVID-19 last March 2020. Education set up has changed.

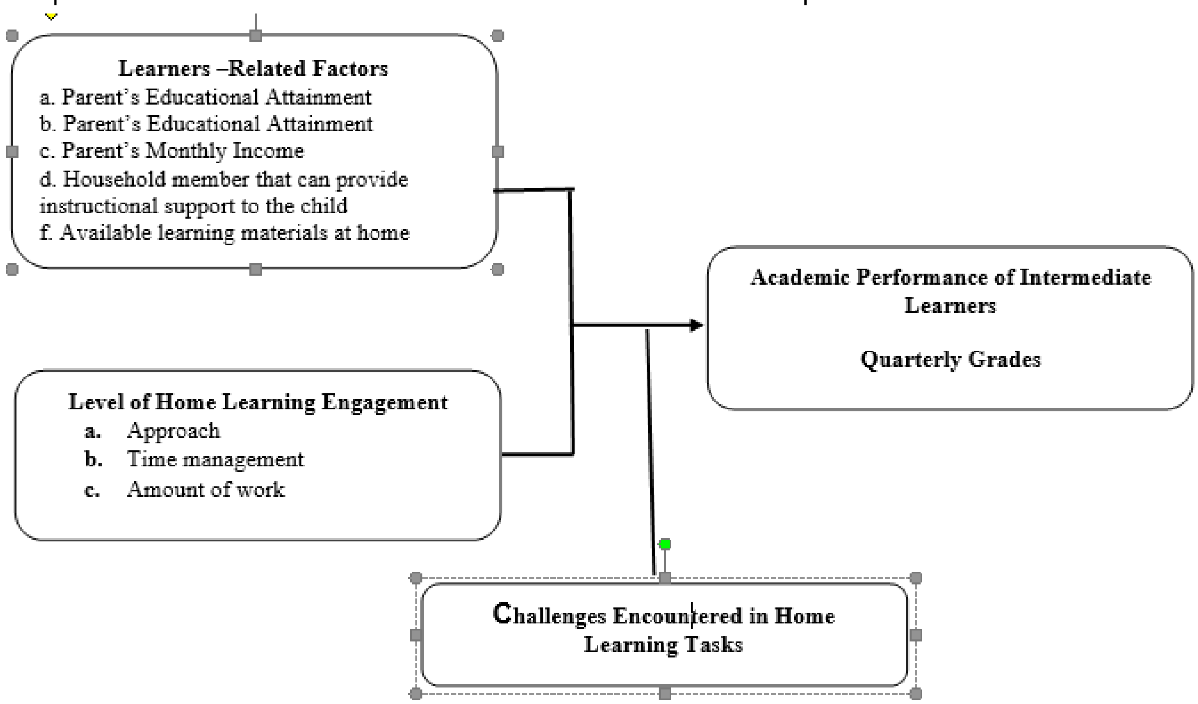
For the duration of the pandemic, educators have to adapt to the changes in delivering instruction to the learners. These changes include the different learning modalities which can cater to the multiple intelligences of the learners, which can jive with the learning environment a learner has, and which can easily establish a connection between the educator in delivering instruction and the learner.

And for those changes, the new setup for the so-called new normal is distance learning and blended learning. Distance learning refers to the delivery of instruction wherein the educator and the learner are of a different place. The different learning modalities under distance learning that the Department of Education has in the new normal to have the continuity of learning are as follows: (a) Modular Distance Learning (b) Online Distance Learning, and (c) Television/ Radio-Based Instruction. Blended learning on the other hand is the combination of face-to-face and any of the distance learning modalities.

Modular distance learning is the learning modality that uses printed materials or the self-learning module in the delivery of instruction or lessons. An individual studies the given printed materials on his own. Online distance learning is the use of technology or applications in delivering instruction such as Google classroom, Google meet, zoom, and messenger chat and room to name some, or any platform that requires the use of an internet connection so that there will be an interaction between the teacher and the learner. Television/radio-based instruction is the use of recorded video or audio of the given printed materials or self-learning modules. This can be saved on a flash drive, cellular phones, hard drive, etc.

In this study, the learning modality that the researchers focused on is modular distance learning—the use of printed materials or self-learning modules since it is the one that they utilized in delivering instruction for the school year 2020-2021. They looked into the significant effect between the use of self-learning modules and their academic performance.

The researcher was guided by the paradigm shown below.
Independent Variable Dependent Variable



The table shows the figure concept of the study entitled, "Home Learning Engagement of Students under Modular Instruction". The independent variables are the learners-related factors like the parent's educational attainment, parent's educational attainment, parent's monthly income, household member that can provide instructional support to the child and available learning materials at home. It is also included the Level of Home Learning Engagement in terms of approach, time management and amount of work.

On the other hand, the academic performance of the intermediate learners determined as the dependent variables that can be affected challenges encountered in home learning tasks.

Statement of the Problem

This study aimed to assess the home learning engagement of students under modular instruction of the intermediate learners of Abra State Institute of Sciences and Technology, Laboratory School, Main Campus.

Specifically, it sought to answer the following:

1. What is the profile of the intermediate learners in terms of:
   a. parent's educational attainment;
   b. parent's employment status;
   c. parent's monthly income;
   d. household member that can provide instructional support to the child; and
   e. availability of learning materials at home?
2. What is the level of engagement of learners as observed by parents in home learning tasks classified as:

a. approach;
b. time management, and
c. amount of work?

3. What are the challenges that may affect students learning process through home-based learning as perceived by teachers and parents?
4. What are the academic performance of the intermediate learners for the School Year 2020-2021?
5. Is there a significant relationship between the parent's profile of the learners and their academic performance?
6. Is there a significant relationship between the academic performance and the level of engagement of pupils' in-home learning tasks?
7. Is there a significant agreement between parents and teachers on the perceived problems encountered on print modular learning (PML)?

Methodology

Research Design. This study used the descriptive method of research to determine and analyze the extent of home learning engagement of students under modular instruction and academic performance among the grade 4 and grade 5 learners of Abra State Institute of Sciences and Technology, Laboratory School, Main Campus. Specifically, the correlation method was used to determine which of the factors considered in the study will be significant predictors of the pupil's performance, teachers, and their parents.

Research Methodology. The researchers formulated a survey questionnaire and translated to native language specifically Iloco to gather information from the respondents. A statistician was also consulted to check the survey to and to make sure that the instrument is effective enough to measure all the variables in the research. The questionnaires were given to the respondents, retrieved for tallying, undergo statistical treatment, interpretation, and analysis.

The researchers asked permission to the chairman to use the report card of the grade 4 and 5 pupils to determine the academic performance of the respondents. The grades of the pupils from first to fourth quarter were tallied, undergo statistical treatment, interpretation, and analysis.

Population and Locale of The Study. The population of the study covered the Grade 4 and Grade 5 learners as well as their parents/guardians and the elementary teachers of the Abra State Institute of Sciences and Technology, Laboratory School, Main Campus. The grade four pupils consist of five (5) boys and eleven (11) girls with a total of sixteen (16) pupils while the grade 5 pupils consist of 11 boys and 16 girls with a total of 27 pupils. The overall total of the learners is forty-three (43). There are forty-three (43) parents/guardians involved in the study and 6 teachers in the elementary from Kinder to Grade 5.

Data Gathering Statement. A questionnaire was used as the main data gathering instrument that consists of three parts. The first part is designed to gather the profile of the parents in terms of educational attainment, occupation, and monthly income, household members that can provide instructional support to the child, available learning materials at home, and the quarterly grade of the child to be accomplished by the teacher.

The second part of the questionnaire is divided into three parts which are the approach, time management, and amount of work that will evaluate the engagement of the learners' in-home learning engagement of students under modular instruction. The degree of measurement ranges from:

Score	Descriptive Rating
5	Always (A)
4	Often (O)
3	Sometimes (S)
2	Rarely (R)
1	Never (N)

Lastly, the questionnaire includes the challenges encountered in the home learning engagement to be ranked from 1-10 by the teachers and the parents.

Statistical Treatment of Data. To substantiate the presentation, analysis, and interpretation of the data to be gathered in this study, the following statistical tools were utilized:

1. Frequency count and percentages were used to describe the socio-demographic profiles of the Grade 4 and Grade 5 pupils of Abra State Institute of Sciences and Technology, Laboratory School, Main Campus, and the parent-related factors.
2. Mean is used to determine the level of the academic performance of the pupils and the level of learning engagement of pupils at home.
3. Bivariate Correlation Analysis is used to determine the relationship between parent's profile of the learners and their academic performance, the significant relationship between the academic performance and the level of engagement of pupils' in-home learning tasks; and to determine the significant agreement on the perceived problems encounter between the parent and teachers on print modular learning (MPL).

Results and Discussions

It focuses on the presentation, analysis, and interpretation of data on the home learning engagement and the academic performance of the intermediate learners.

1.What is the profile of the intermediate learners in terms of parent's educational attainment, parent's employment status, parent's monthly income, the household member that can provide instructional support to the child; and availability of learning materials at home?

Table 1.The Profile of the Intermediate Learners of Abra State Institute of Sciences and Technology, Laboratory School, Main Campus

Profile	Frequency (N=62)	Percentage
1.Parents' Educational Attainment (Father)		
Bachelor's Degree with MA Units	1	2.32%
Bachelor's Degree	14	32.56%
College Level	10	23.26
Vocational Course	0	0%
High School Graduate	18	41.87%
Total	43	100%
Parents' Educational Attainment (Mother)		
Doctorate Degree	0	0%
MA with Doctoral Units	2	4.65%
Master's Degree	0	0%
Bachelor's Degree with MA Units	1	2.32%
Bachelor's Degree	13	30.23%
College Level	17	39.53%
Vocational Course	1	2.32%
High School Graduate	9	20.93%
Total	43	100%
2.Parents' Occupation (Father)		

Employed	9	20.93%
Self Employed	21	48.84%
Retired	0	0%
Unemployed	9	20.93%
Others (deceased etc.)	4	9.30%
Total	43	100%
Parents' Occupation (Mother)		
Employed	18	41.86%
Self Employed	17	39.53%
Retired	0	0%
Unemployed	7	16.28%
Others (deceased etc.)	1	2.33%
Total	43	100%

3.Parents' Monthly Income		
Php 5, 000.00 and below	3	6.98%
Php 5, 000.00 --- Php 10, 000.00	3	6.98%
Php 10, 000.00 --- Php 15, 000.00	6	13.95%
Php 15, 000.00 --- Php 20, 000.00	11	25.58%
Php 20, 000.00 --- Php 25, 000.00	7	16.28%
Php 25, 000.00 and above	13	30.23%
Total	43	100%
4. Household members that can provide instructional support to the child.		
Parents/Guardians	34	79.07%
Elder Siblings	3	6.98%
Grandparent	3	6.98%
Extended members of the family	1	2.33%
Others (tutor, house helper)	2	4.65%
Total	43	100%
5. Available learning materials at home.		
a. E-learning Gadgets		
Basic Cellphones	5	11.63%
Smartphones	35	81.39%
Laptop	1	2.33%
Tablets	2	4.65%
Total	43	100%
b. Printed Media Educational References		
Magazines	1	2.33%
Cookbooks	0	0%
Pamphlets	3	6.98%
Maps	0	0%
Calendars	0	0%
Alphabet Posters	1	2.33%
Chart	0	0%
Newspaper/journals	6	13.95%
Books	32	74.42%
Total	43	100%

On Parents' Educational Attainment

The table shows that majority of the fathers' educational attainment is high school graduate with 18 or 41.87% meanwhile there are 14 or 32.56% who finished bachelor's degree, 10 or 23.26% of them are reached college level, and 1 or 2.32 % is bachelor's degree with MA units. It pertains that all the fathers undergo in formal education.

On the other hand, 17 or 39.53% majority of mothers' educational attainment have reached college level, 13 or 30.23% finished bachelor's degree, 9 or 20.93 % are high school graduate, 2 or 4.65% are master's graduate with doctoral units, and 1 or 2.32% is bachelor's degree with MA units and a vocational graduate. This finding manifest that most of the mothers' attained a higher degree in terms of education.

Nelson (2009), affirmed that guardians who have accomplished degrees have appeared they value education. Those who accomplished higher academic achievement in college are continuing studying graduate and doctoral degrees. Their past accomplishment becomes a benchmark for their children to follow in their footsteps in attaining their ambitions in life. In contrast, he too confirmed that those guardian who did not graduate, most of them have no money or aspiration to support higher – education of the learners. Learners whose guardians have never gone to college are sometimes experiencing choices between family desire or obligation and finishing a degree.

Kalil et. al (2012), expressed that college-educated mother spends more time giving childcare and age-appropriate tasks with their children than moms who have are high school graduate. Overall, educated guardians (i. e. guardians with more than 4 years of tertiary experiences) spend more time with their children than guardians who have less academic experience (Guryan et. al, 2008)

According to Davis-Kean (2005), guardians with a longer time of education have high expectations for the success of their son/daughter in education, they actively support their children to pursue their high expectations in education.

On Parents' Occupation

As presented in the table, 21 or 48.84% of the respondents along father's occupation are self-employed, while 9 or 20.93% are employed and unemployed. 4 or 9.30% are deceased, etc. No one is retired to his/her job. It only shows that most of the fathers are working to support their family needs.

On the other hand, the majority of the respondents along mother's occupation are employed with 18 or 41.86% and self-employed with 17 or 39.53%. 7 or 16.28% are unemployed while 1 or 2.33% are deceased and others. It also pertains that most of the respondents' mothers are employed because, since that most of them are reached college level.

Based on the study of Jerald Cano-og Moneva et al. (2020) on "Guardians Occupation and Students' Self-regard", affirmed that parent's occupation is the main responsibility of the guardians and they must have appropriate work to raise their kids. Guardians that have the low or high status of occupation can't influence the confidence of the students.

On Parents' Monthly Income

It can be seen in the table that the majority of the respondents' parents earn Php. 25, 000.00 and above monthly, with 13 or 30.23% while 11 or 25.58% earns Php. 15, 000.00 – Php. 20, 000.00. Moreover, 7 or 16.28% earned Php 20, 000,00 - Php. 25, 000. 00, 6 or 13.95% earns Php. 10, 000.00 – Php. 15, 000.00, while 3 or 6.98% earns Php. 5, 000.00 – Php. 10, 000.00 and Php. 5, 000.00 and below monthly. This could have explained that majority of the parents have high-wage jobs due to most of them have higher educational attainment.

As cited by Ezegbe (2017), the impact of financial status, particularly parents' wage and parent-child relationship on student's academic achievement is being affected. The higher the academic performance for a learner is achieved by those learners from a family with financial means and guardians who are professionals motivate their children to pursue studies and that learners with rich families are providing all the resources needed in their schooling.

However, Desforges and Abouchaar (2003), oppose that money is not the factor to determine the number of children who will go to school from a poor family, they also oppose that high academic achievements are attained only by reach families.

On Household members that can provide instructional support to the child.

As gleaned from the table, 34 or 79.07% of parents or guardians have much time in assisting their children in their studies especially in answering modules. 3 or 6.98% elder siblings and grandparents helped their brother or sister/ granddaughter or grandson in their studies, while 2 or 4.65% tutor/ house helpers assist the respondents in their modules. Moreover, 1 or 2.33% of extended members of the family helped the nephew in his studies. Based on the findings, even though parents/guardians have their works they set time to teach their children. The involvement of the household members is significant to their children's education to attain high grades and passed all the learning subjects.
According to Henderson & Berla et.al (1994), that family involvement has a big impact on children's accomplishments in school. When families are participating in their children's education, children gain higher grades and get higher scores on tests, go to school regularly, finished homework, show more positive actions and behaviors, graduate from high school, and more likely to enter college than learners with less involved guardians.

Bester (2015), points out that support from relatives can give a good atmosphere, guidance, and love to the child. Therefore, the child is more active and less stressed in answering learning tasks and the child benefited from the support of his relatives.

The Family Lives Organization stated that children can accomplish well at school when their family and companions take an interest in their studies. Involving in child's education is very significant to them even in the simplest way. Often, the more affection and support a son/daughter feels at home, the easier for him to learn at school.

On Available Learning Materials at Home

On the availability of E-learning gadgets, it is evident that the majority of the respondents used smartphones with 35 or 81.39% in their studies. There are 5 or 11.63% of the respondents used basic cellphones, 2 or 4.65 % uses tablets and 1 or 2.33% of the respondents uses laptops in their studies. Implies that the parent can afford gadgets for the studies of their children due that most of them have jobs. According to Fordjour, Zakaria, and Afriyie (2015), a smartphone is mobile which is advance in computing capability and faster connectivity to the internet than a basic phone which has limited functions. Smartphones were released within the year 2000. It was invented by Ericson and the model was called R380 (Alfawareh & Jusoh, 2014). Smartphones reinforce learning either offline or online. Offline get to empower clients of smartphones to store any form of learning materials such as pdf, PowerPoint, word, excel, pictures and animations and images. Internet connection is also needed for learners and teachers to visit websites to meet their data needs.

On the availability of printed media educational references, the table shows that 32 or 74.42% uses books at home as their references in answering modules. 6 or 13.95% of the respondents use newspapers/journals, 3 or 6.98% used pamphlets, and 1 or 2.33% uses magazines and alphabet posters in their studies. It pertains that they have some books or they borrowed books from their neighbors for the studies of their sons/daughters.

Baron, et al. (2017), found out that most of the students accepted that they can learn better on the course material, they remembered lessons better if they read the learning materials and they considered themselves to be more likely to study printed learning materials.

2. What is the level of engagement of learners as perceived by parents in home learning tasks classified as:
a. approach
b. time management, and
c. amount of work?

Table 2.a The Level of Engagement of Learners as Observed by Parents in Home Learning Tasks Classified as Approach

Indicator of Approach	**Mean** ($\bar{x}$)	**Descriptive Rating**
1. Sort out the learning modules per subject area needed properly. (Nabinsabinsa dagiti modyul iti tunggal subject)	4.63	Always
2. The learner has enough time working the module. (Adda naan-anay nga oras ti ubing nga mangadal ken mangsubat iti modyul na)	4.44	Always
3. The learner feels free to ask for clarification on the module. (Siwawaya it ubing nga agdamag kadagiti haanna maawatan iti modyul)	4.02	Often
4. The learner understands how to work on the module independently. (Maawatan ti ubing dagiti aramiden na iti modyul nga is-isuna)	3.6	Often
5. The learner shows willingness in answering the module. (Disnudo ti ubing ti inna panagsungbat ti modyul)	3.7	Often
6. The learner conflicts with other activities while working on the module. (Adda masansan nga aramiden ti ubing nga makaisturbo bayat ti inna panagadal ken panagsungbat iti modyul na)	2.6	Sometimes
7. The learner answers the module for compliance. (Tungpal bilin lang ti panagsungbat iti modyul)	2.3	Rarely
8. Household chores affect learner focus on answering the module. (Haan nga makapokos nga agsungbat ti ubng gapu kadagiti trabaho ti pagtaengan)	2.23	Rarely
Over all	3.44	Often

Legend: Mean Score	Descriptive Rating
4.21- 5.00	Always (A)
3.41 – 4.20	Often (O)
2.61 – 3.40	Sometimes (S)
1.81 – 2.60	Rarely (R)
1.00 – 1.80	Never (N)

Table 2a shows that the overall level of engagement of learners as observed by parents in home learning tasks classified as the approach was described as “Often” with a mean of 3.44. The parent observed always that sort out the learning modules per subject area needed and the learner has enough time working module and with a mean of 4.21-5.00 while they often observed that the learner feels free to asks clarification on the module, the learner understands how to work on the module independently and the learner shows willingness in answering the module with a mean of 3.41 – 4.20. Lastly, parents observed rarely that the learner answers the module for compliance and household chores affects learner focus on answering the module with a mean of 1.81 – 2.60.

As stated by Carry (1994), the modular approach uses printed materials that are properly organized in a righteous sequence for the learner’s advances at his own pace, in which answers are checked immediately.

Creager (1996), listed a few benefits of the utilized of informative materials using the modular approach: (1) Self-educational material permits the educator to focus on the learner's deficiencies topic that should be rectified; (2) serve to dispense with the need of covering topic known to the learners; and (3) give a method of evaluating the learner's progress in learning.

Table 2.b The Level of Engagement of Learners as Observed by Parents in Home Learning Tasks Classified as Time Management

Time Management	Mean ($\bar{x}$)	Descriptive Rating
1.The learner finishes the module on time allotted. (Nalpas ti ubing ti modyul na iti naituding nga oras)	3.81	Often
2.The learner uses his/her time effectively in answering the module. (Ammo ti ubing nga usaren nga nasayaat iti oras ti panagsunbat ti modyul)	3.77	Often
3.The learner can work productively in answering the activities in the module (Produktibo ti ubing nga agsungbat kadagiti aktibidades ti modyul)	3.93	Often
4.The learner deals with difficult tasks without procrastinating. (Haan nga itantan ti ubing nga aramiden kadagiti narigat nga parte ti modyul)	3.51	Often
5.The learner prefers to answer the module in the morning (Kaykayat ti ubing nnga sungbatan ti modyul na iti bigat)	3.65	Often
6.The learner prefers to answer the module in the morning (Kaykayat ti ubing nnga sungbatan ti modyul na iti rabii)	3.51	Often
7. The learner follows the daily class schedule given by the teacher. (Sursuruten ti ubing tay naited nga inaldaw nga schedule ti mestra)	3.58	Often
8.The learner follows the time given by his parent/guardian to answer his module. (Sursuruten ti ubing ti oras nga inted ti nagannak/mangay-aywan kanya nga agsungbat ti modyul na)	3.44	Often
Over All	3.65	Often

Legend: Mean Score	Descriptive Rating
4.21- 5.00	Always (A)
3.41 – 4.20	Often (O)
2.61 – 3.40	Sometimes (S)
1.81 – 2.60	Rarely (R)
1.00 – 1.80	Never (N)

It is presented in table 2b that the overall level of engagement of learners in home learning tasks as observed by the parents when it comes to time management was rated "often" with a mean of 3.65. Based on the observation of the parents to their children, all the indicators stated in time management are rated "often" with a mean from 3.41-4.20. This means that the respondents are practiced good time management in studying their modules and answering the given activities with them.

Based on Kearns & Gardiner (2007), time management skills have shown a positive impact on learners learning and related results. Several studies have recognized the positive effect of time management. Time management abilities have appeared to have a positive effect on student learning and students.

Krause & Coates (2008), showing that the ability to effectively overseeing their time is the benchmark of students in exercising good study habits and techniques for success.

Table 2.c The Level of Engagement of Learners as Observed by Parents in Home Learning Tasks Classified as Amount of Work

Amount of Work	**Mean** ($\bar{x}$)	**Descriptive Rating**
1. The learner answers the modules easily. (Laklakaen a sungbatan ti ubing ti modyul na)	3.47	Often
2. The learner learns much in his/her module. (Adda naadal ti ubing ayan iti modyul na)	4.09	Always
3.The learner has a lot of activities to answer in his/her module (Adu dagiti sungbatan ti ubing iti modyul na)	3.84	Often
4. The learner shows effort to work on his/her module independently. (Maipakita ti ubing nga kaya na aramiden ti module nga is-isuna)	3.37	Sometimes
5. The learner experiences difficulty in self-learning. (Marigatn ti ubing mga mangadal ti modyul na nga is-isuna)	2.95	Sometimes
6. The learner is pressured in studying/answering his/her module. (Mapressure ti ubing nga mangadal/agsungbat ti modyul na)	2.98	Sometimes
7.The learner has no enough time to answer the modules because of too many modules given (Agkurang ti ors ti ubbing nga agsungbat ti modyul gapu ti kina adu ti modyul nga maited.	2.16	Rarely
8. The learner cannot even help the parents in the household chores because of too many modules to finish. (Awan ti oras ti ubing nga tumulong nga gatrabaho ti uneg ti pagtaengan gapu ti panagsungbat ti modyul)	2.21	Rarely
Over All	3.14	Sometimes

Legend:

Mean Score	Descriptive Rating
4.21- 5.00	Always (A)
3.41 – 4.20	Often (O)
2.61 – 3.40	Sometimes (S)
1.81 – 2.60	Rarely (R)
1.00 – 1.80	Never (N)

Table 2c shows that the overall level of engagement of learners as observed by parents in home learning tasks classified as amount of work was rated “Sometimes” with a mean of 3.14. The learner learns much in his/her module has the highest mean of 4.09 and describes as “Always”. On the other hand, the learner has no enough time to answer the modules because too much module given has the lowest mean of 2.16 and describes as “Rarely”. It is implied that the learners have the exact amount of works to finish, they learned a lot in the modules and at the same time, they have time to help their parents with household chores.

3. What are the challenges that may affect students learning process through home-based learning as perceived by parents and teachers?

Table 3. Challenges that may Affect Students Learning Process through Home-Based Learning as Perceived by Teachers and Parent

Parent/Teachers' Factor	Parents Mean Rank	Rank	Teachers Mean Rank	Rank
1. Miscommunication to the instructions of the different activities in the module. (Agduduma nga panakaawat kadagiti pagallagadan ti aktibidades iti modyul)	3.02	2	7.33	8.5
2. Environmet is not a conducive place for learning. (Ti uneg ti pagtaengan ket saan nga nasayaat nga lugar ti pagadalan)	4.21	3	3.17	2
3. Low interest of the leaner in modular instruction. (Saan nga interesado nga agadal ti ubing babaen ti p anagusar ti modyul)	4.72	4	3.83	3
4. The distribution and retrieval of modules are not strictly followed. (Ti panakaiwaras ken panagala kadagiti modyul ket haan a masursurot)	7.26	8	6.67	6
5. Parents and teachers' negligence in monitoring the learner's performance. (Panakaliway dagiti nagannak ken mangisusuro iti panangbayabay da iti panagadal ti ubing)	8.07	9	7.33	8.5
6. Insufficient reading materials and other references at home. (Awan ti naan anay nga mausar nga pagadalan ken pagibasaran dagiti ubbing iti uneg ti pagtaengan)	2.09	1	2.33	1
7. The learner answers the module for granted only. (Sungbaten laeng ti ubing ti modyul iti tungpal bilin.	4.98	5	3.84	4
8. The module has limited information on the discussion part of the lesson. (Agkurkurang ti panakaiyesplikar kadagiti topiko nga adda iti modyul)	6.07	7	7	7
9. Inadequate teaching strategies to motivate the learner in the learning process. (Saan ngg makaay ayo dagiti wagas nga panagisuro kadagiti ubbing)	5.58	6	4.83	5
10. Weak partnership of teachers and parents concerning home learning engagement. (Nakurang ti panagkakadwa dagiti naggannak ken mangisursuro maipanggep ti panagal ti uneg ti pagtaengan)	8.98	10	8.5	10

As to the parents' challenges that may affect students learning process through home-based learning, the table shows that "insufficient reading materials and other references at home" was the first rank on the list with a mean of 2.09. It only entails that the parents, guardian, relatives, or parents must provide more reading materials and other references to the learners like books, activity sheets, newspapers, subscriptions, and others for them to easily understand and answer the given modules. The second challenge observed was "miscommunication to the instructions of the different activities in the module" with a mean of 3.02 it shows that the parents/guardian is not able to understand an instruction or did not follow the directions properly in answering the activities, while the third in the list is "the environment is not a conducive place of learning with a mean of 4.21". It implies that the learning inside the classroom is better than inside the house, the parents must provide a study room or observe a silent environment for their child when he/she answering modules.

On the other hand, the challenges that may affect students learning process through home-based learning as teachers revealed on the table, the first rank is “insufficient reading materials and other references at home” with a mean of 2.33. It is also the same problem with the parents regarding the inadequate references of the learners for the home-based learning. Second, “the environment is not a conducive place of learning with a mean of 3.17. These challenges encountered by teachers on home learning engagement was rank according to their observation, comments, interview to the parents and learners, and perception during their monitoring to the learners.

Based on the study of Michell Acala (2021), "Modular Distance Learning Modality: Challenges of Teachers in Teaching Amid the Covid-19 Pandemic", the difficulties of instructors were recognized based on how they plan, distribute learning modules, monitoring student’s learning, check, assess outputs and give feedbacks to learner’s achievement. Besides, instructors utilized different approaches to adapt to difficulties experienced in measured distance learning modality, like, using time productively, advancing teaching strategies, adjusting to the progressions brought by the pandemic in education, being flexible, providing effective plans, being hopeful, and patient

Constatntino, et al. (2020), "Challenges Encountered by Parents in the Education of their Children during COVID-19 Pandemic", the primary difficulties experienced by the guardians were: need or limited access to the web and poor internet connection within their place. While in printed modules, there are some parts are not readable, and some colors are not suited to the figures and pictures.

4. What are the academic performance of the intermediate learners for the School Year 2020-2021?

Table 4. The Academic Performance of the Intermediate Learners for the School Year 2020-2021

Subjects	**Mean** $(\bar{x})$	**Descriptors**
Filipino	89.38	Proficient
English	90.23	Highly Proficient
Mathematics	89.38	Proficient
Science	88.06	Proficient
Araling Panlipunan	87.84	Proficient
Edukasyong Pantahan at Pangkabuhayan	89.69	Proficient
MAPEH	89.12	Proficient
Edukasyon sa Pagpapakatao	89.48	Proficient
Overall	89.15	Proficient

Legend:	Grading Scale	Descriptors
	90-100	Highly Proficient (HP)
	85-89	Proficient (P)
	80-84	Nearly Proficient (NP)
	75-79	Low Proficient (LP)
	Below 75	Not Proficient (NP)

The table shows the academic performance of the intermediate learners within the school year. The respondents are “Highly Proficient” in English with a mean of 90.23 while they are “Proficient” in Filipino, Mathematics, Science, Araling Panlipunan, Edukasyong Pantahanan at Pangkabuhayan, MAPEH, and Edukasyon sa Pagpapakatao with a mean of 85-89.

Overall, the learners are “Proficient’ along with the eight (8) subjects in intermediate with a mean of 89.15 which indicates that the learners performed well in their academics using modular distance learning as their mode of learning modality.

For Caballero, et al. (2007), the academic performance includes meeting objectives, accomplishments, and targets set in the program or course that a student attends. These are presented through grades as the result of an assessment of their learning tasks.

Marti (2003), found that academic performance includes factors like intellectual level, character, inspiration, abilities, interest, study habits, teacher-learner relationships. An unsatisfactory academic achievement is one that does not meet the expected output or has very low performance.

5. Is there a significant relationship between the parent’s profile of the learners and their academic performance?

Table 5. The Significant Relationship between Parent’s Profile of the Learners and their Academic Performance

Profile	Filipino	English	Mathematics	Science	Aral Pan	EPP	MAPEH	ESP	Overall
Educational Attainment (Father)	0.173	0.23	0.266	.310*	0.3	.302*	0.24	0.137	0.267
Educational Attainment (Mother)	0.21	0.166	-0.016	0.267	0.119	0.238	0.21	0.179	0.194
Occupation (Father)	-0.174	-0.14	-0.092	0.095	-0.044	-0.012	-0.053	-0.134	-0.076
Occupation (Mother)	0.021	0.107	0.183	0.041	0.052	0.051	0.117	0.147	0.098
Parents’ Monthly Income	.427**	0.283	0.266	0.249	0.181	0.199	.332*	.376*	.324*
Household Members	0.1	0.088	0.159	0.022	0.026	0.027	0.047	0.133	0.083
Available Materials (E-learning)	-0.151	0.022	0.085	-0.223	-0.036	-0.008	-0.162	-0.202	-0.106
Available Materials (Printed)	-0.063	0.076	0.097	-0.055	0.046	0.053	-0.048	-0.024	0.006

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The table shows the relationship between the parents’ profile of the pupils and their academic performance. Generally, the parent’s monthly income and the academic performance of the pupils are significantly related. This is evident in the findings shown in the table which is found to be significant at 0.01 and 0.05 respectively. Based on the data gathered, more parents who are employed which implies that they have the means to provide the learning materials needed by the pupils during this time of the pandemic. When there are more resources, they can expand their knowledge on things.

Based on the study of Adzido et al. (2016) the found out the family income of Polytechnic students affects their studies, motivation, and academic achievement in their school life. Therefore, the high financial status of the family is very significant to improve students' learning, motivation, and academic achievement. However, some students disagree that family income status is not the basis to attain better academic performance. The study concludes that the high financial status of a family, may affect students' academic performance, but for the responsible and active students, low family income is not the reason for poor academic performance.

6. Is there a significant relationship between academic performance and the level of engagement of pupils' in-home learning tasks?

Table 6. The Significant Relationship between the Academic Performance and the Level of Engagement of Pupils in Home Learning Tasks

Home Learning Engagement Type	Filipino	English	Mathematics	Science	Aral Pan	EPP	MAPEH	ESP	Overall
1.approach	-0.053	0.019	0.131	0.032	0.061	0.123	0.102	0.069	0.063
2. time management	.336*	.450**	.521**	.532**	.457**	.384*	.462**	.519**	.509**
3.amount of work	-0.131	-0.087	0.096	0.037	-0.045	-0.026	0.039	0.021	-0.015

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

As a whole, the table shows that there is a significant relationship between academic performance and the level of engagement of pupils' in-home learning tasks specifically time management. This is evident in the findings shown in the table is found to be significant at 0.01 and 0.05 respectively. It signifies that pupils learned the value of time management in accomplishing their home learning tasks.

According to Brigitte, et al. (2005), time management plays important role in developing learners' academic performance. They added that each student must practice time management to have organized activities, set goals, and give importance to those activities that need to finish immediately.

Based to the investigation of Adebayo (2015), asserted that there is a positive relationship between time management factors like prioritization, lingering, socialization, and the learner's academic performance. The further implications of the study recommend that students ought to focus on their assignments and finish their tasks before deadlines and fewer socialization activities.

The study of Nashrullah and Khan (2015), recognized time management factors to incorporate planning (short reach and long-range), time attitude as independent factors connecting to learner's academic achievement. The finding showed that time usage variables like short reach, long reach, and using time productively are essentially correlated to students' academic performance.

7. Is there a significant agreement between parents and teachers on the perceived problems encountered on print modular learning (PML)?

Table 7. The Significant Agreement between Parents and Teachers on the Perceived Problems Encountered on Print Modular Learning (PML)?

Respondents	r-value
Parents/Teachers	0.671*

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

As gleaned in Table 7, parents and teachers significantly agreed at a 0.05 level of significance. This means that parents and teachers agreed that there are problems encountered on print modular learning (PML) by both parties.

Conclusion and Recommendations

Findings

Based on the data gathered, analyzed, and interpreted, the following are found:

1.The intermediate learners of ASIST Laboratory School, Main Campus were described in terms of parent's educational attainment, parent's employment status, parent's monthly income, the household member that can provide instructional support to the child; and availability of learning materials at home.

a) Parents Educational Attainment, majority of the fathers' educational attainment is high school graduate with 18 or 41.87%, while 17 or 39.53% majority of mothers' educational attainment have reached college level, b) On Parents' Occupation, 21 or 48.84% of the respondents along father's occupation are self-employed and the majority of the respondents along mother's occupation are employed with 18 or 41.86%, c) On Parents' Monthly Income, majority of the respondents' parents earn Php. 25, 000.00 and above monthly with 13 or 30.23%, d) On Household members that can provide instructional support to the child, 34 or 79.07% parents or guardians have much time in assisting their child in their studies, e) On Available Learning Materials at Home, in E-Learning Gadgets majority of the respondents used smartphones with 35 or 81.39% in their studies while in printed media educational references 32 or 74.42% uses 1 or 2 books at home as their references in answering modules.

2. The level of engagement of learners as perceived by parents in home learning tasks classified as a) approach, the parent observed always that sort out the learning modules per subject area needed and the learner has enough time working module and with a mean of 4.21-5.00 while they often observed that the learner feels free to asks clarification on the module, the learner understands how to work on the module independently and the learner shows willingness in answering the module with a mean of 3.41 – 4.20. Lastly, parents observed rarely that the learner answers the module for compliance and household chores affects learner focus on answering the module with a mean of 1.81 – 2.60. The overall level of engagement of learners as observed by parents in home learning tasks classified as the approach described as “Often” with a mean of 3.44, b) time management, based on the observation of the parents to their children, all the indicators stated in time management are rated “often” with a mean from 3.41-4.20. The overall level of engagement of learners in home learning tasks as observed by the parents when it comes to time management was rated “often” with a mean of 3.65, c) amount of work, The learner learns much in his/her module has the highest mean of 4.09 and describes as “Always”. On the other hand, the learner has no enough time to answer the modules because too much module given has the lowest mean of 2.16 and describes as “Rarely”. The overall level of engagement of learners as

observed by parents in home learning tasks classified as amount of work was rated “Sometimes” with a mean of 3.14.

3. The challenges that may affect students learning process through home-based learning as perceived by parents and teachers, both parents and teachers perceived that “insufficient reading materials and other references at home” was the primary problem encountered to the list with a mean of 2.09 and 2.33. Second, “miscommunication to the instructions of the different activities in the module” with a mean of 3.02 and, “the environment is not a conducive place of learning with a mean of 3.17.

4. The academic performance of the intermediate learners for the School Year 2020-2021, the respondents are “Highly Proficient” in English with a mean of 90.23 while they are “Proficient” in Filipino, Mathematics, Science, Araling Panlipunan, Edukasyong Pantahanan at Pangkabuhayan, MAPEH and Edukasyon sa Pagpapakatao with a mean of 85-89. Overall, the learners are “Proficient’ along with the eight (8) subjects in intermediate with a mean of 89.15.

5. The significant relationship between parent’s profile of the learners and their academic performance, generally, the parent’s monthly income and the academic performance of the pupils are significantly related at 0.01 and 0.05 (2-tailed) respectively.

6. The significant relationship between the academic performance and the level of engagement of pupils’ in-home learning tasks, there is a significant relationship between the academic performance and the level of engagement of pupils’ in-home learning tasks specifically time management at 0.01 and 0.05 (2-tailed) respectively.

7. The significant agreement between parents and teachers on the perceived problems encountered on print modular learning, parents, and teachers significantly agreed at 0.05 level of significance. This means that parents and teachers agreed that there are problems encountered on print modular learning (PML) by both parties.

Conclusion

Based on the findings of the study, the following conclusions were drawn:

1. Most of the respondents’ fathers are high school graduates and they are self-employed. On the other hands, most of their mothers are reached the college level and are employed. The parents’ monthly income is from Php. 25, 000.00 and above monthly.

2. The parents or guardians are the household members that can provide instructional support to the child. They used smartphones and 1 or 2 books at home as their references in answering modules.

3. The parents observed that sorting learning modules per subject area and giving enough time in the working module is very significant to their children. Time management is observed often by the learners.

4 .Insufficient reading materials and other references at home, miscommunication to the instructions of the different activities in the module and the environment are not a conducive place of learning was the greatest challenges faced by parents and teachers in home-based learning.

5. The overall academic performance of the intermediate learners for the School Year 2020-2021 is “Proficient’ along with the eight (8) subjects (Filipino, Mathematics, Science, Araling Panlipunan, Edukasyong Pantahanan at Pangkabuhayan, MAPEH, and Edukasyon sa Pagpapakatao).

6. The parents' monthly income affected the academic performance of the learners.

7. Time management had a significant relationship with the academic performance of the learners.

8. Parents and teachers agreed that there are problems encountered with print modular learning.

Recommendation

Based on the above findings and conclusions of the study, the following are recommended:

1. Parents must find a good job to have a high monthly salary so that they can provide all the learning materials for the schooling of their children.

2. Siblings, extended family members, and friends must be motivated and eager to help learners in their studies.
3. The parents and teacher must provide more reading materials and other references at home like books, activity sheets, storybooks, charts, newspapers, and others.
4. The instructions for the different activities in the module must be clear. Teachers must develop self-learning modules, with various activities to test the macro skills of the learners.
5. Learners must exercise good time management for their studies to learn more and to finish the target work in the target time.
6. Parent should provide a conducive study room and maintain silent environment when their children are answering modules at home.
7. Teachers should monitor their learners regarding the lessons in their modules through the use of Google classroom or messenger group chat; interview or have chitchat with parents on the study habits of their children to identify the problems encountered with the use of self-learning modules; and conduct home visitation at least twice or thrice a week to maintain the high academic performance of the learners.
8. Parents, teachers, and school administrators must work together to respond to the challenges of learning this time of the pandemic.

Acknowledgement

I offer my sincere appreciation for the learning opportunities provided by the Research and Development Committee of the Abra State Institute of Sciences and Technology and giving the researchers a chance to submit and present this research paper in international conference.
Furthermore, the researchers would like to express the sincere gratitude to Asia-Pacific Consortium of Researchers and Educators (APCoRE) for accepting the research for the 2021 APCoRE Virtual Convention and International Conference.

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Ang Panaghoy: Struggles of Parents with Pregnant Teenage Daughter Amidst Covid-19 Pandemic

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Abstract - This qualitative study using phenomenological research design was conducted to find out the struggles of parents with pregnant teenage daughter amidst Covid-19 pandemic in the Municipality of Miagao, Iloilo. Moreover, it sought to answer the questions on the struggles of parents in terms of financial concerns, social issues/concerns, emotional struggles, and mental state challenges as well as to determine how parents were able to overcome the struggles and their realizations in life. The participants of the study were the five (5) parents from the Municipality of Miagao, Iloilo and are selected based on the set qualifications (i.e., registered 4P's beneficiary, should be both parent (mother and father), earning a monthly income ranging from ₱5,000-8,000, and most especially having a pregnant daughter age 13-19). As the participants responses were collated and transcribe, the findings revealed that most of the parents encountered struggles in terms of financial concerns, social issues/concerns, emotional struggles, and mental state challenges that is worsened by this pandemic. In view of the findings, the researchers were able to come up with the conclusion that parents were able to overcome the challenges by means of acceptance, adjustments, and moving on. At the end, parents realized that in every given situation, the unconditional love for their children succeeds all the challenges.

Keywords - Struggles of parents, Financial concerns, Social issues/concerns, Emotional struggles, Mental state challenges, Overcoming struggles, Realizations in life

Introduction

The new normal had brought tremendous challenges to the family especially to their source of income. The pillars of the family had to tighten their belts in order to survive. This has greatly impacted the parents in all aspects of life. The parents of teenage daughters had to carry heavier loads in this challenging times.

Teenage pregnancy was considered a rampant issue in the society. As of now, there are still young children's who are engaged in sexual intercourse with their partners at an early age. In fact, based on the article retrieved last April 2, 2021 by the UNFPA that was reported last August 14, 2020, the Philippines unfortunately showed one of the highest rates of adolescent fertility in Asia prior to COVID-19, described as a 'national social emergency' last year. The year 2020 is forecasted to have 18,000 more Filipino teenage girls getting pregnant because of the indirect effects of COVID-19, compared to previous years.

Parents play a crucial role in the decision making of their children. Hence, by taking into analysis the biological, psychological, social and financial dimensions. The parents' roles are of the maximum importance for personality development of the children. Basic traditional roles of being a parent are: nurture and educate children, discipline them, manage home and financially support family. Modern roles brought an active participation of fathers in children care. The main idea is that parents must be child-centered and should aim to optimal growth and development of their children, to help them have satisfactory biological, social, psychological and emotional growth. (Priscillafd, 2018)

Generally, given the COVID-19 Pandemic, the increase in number of teenage pregnancies has been immensely observed and recorded. In view thereof, the researchers decided to conduct this study in order to determine the struggles of parents with pregnant teenage daughter amidst COVID-19 Pandemic in terms of financial concern, social issues/concern, emotional struggles, and mental state/challenges and analyze how parents were able to support the needs of their pregnant daughter during pregnancy and after giving birth. Hence, it would be a worthy action for the researchers to determine the struggles of parents and draw a definite conclusion/recommendation based on the collated findings.

Conceptual Framework of the Study

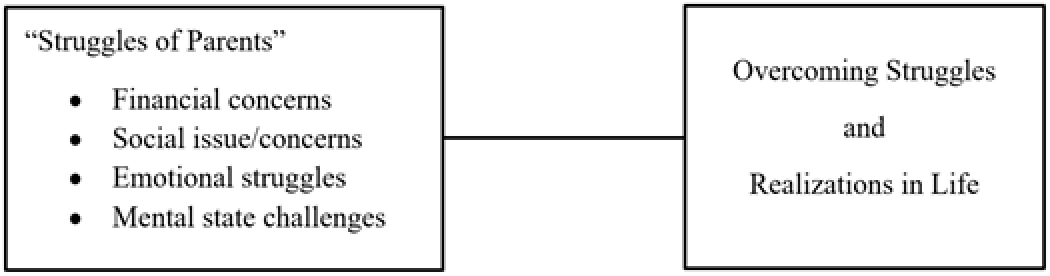

Figure 1: Paradigm of the Qualitative Study

The paradigm shows the struggles of parents with pregnant teenage daughter amidst Covid-19 pandemic in terms of financial concerns, social issues/concerns, emotional struggles, and mental state challenges and its relationship to overcoming struggles and realizations in life.

Theoretical Framework of the Study

Macro Theory

This study entitled "Struggles of Parents with Pregnant Teenage Daughter Amidst COVID-19 Pandemic" was anchored in the Social Learning Theory, proposed by Albert Bandura that emphasizes the importance of observing, modelling, and imitating the behaviors, attitudes, and emotional reactions of others. Social Learning Theory considers how both environmental and cognitive factors interact to influence human learning and behavior. In social learning theory, Albert Bandura (1977) agrees with the behaviorist learning theories of classical conditioning and operant conditioning. However, he adds two important ideas: (1) Mediating processes occur between stimuli & responses and (2) Behavior is learned from the environment through the process of observational learning. (McLeod, 2016)

This theory is pertinent in the study for it describes the stimulus of Social Learning Theory to the society and the people around them. Given that the dilemma is dealing with societal issues, social learning theory explains the importance of social interaction to cope up with the challenges in a time being. According to Akella & Jordan, 2014, Social Learning Theory can be effectively used to understand the occurrence and reoccurrence of teenage pregnancy. The concepts of differential association, definitions, imitation and differential reinforcement can be used to explore the different facets within the struggles of parents with pregnant teenage daughter amidst COVID-19 pandemic.

Micro Theory:

For the purpose of supporting theories, the following micro theories were provided:

First, Family Resource Management Theory by Deacon and Firebaugh 1981, which states that behavioral outcomes stem from demands or goals placed on the use of available resources in a given family management system. The theory consists of key elements: inputs, throughputs (information processes), and outputs (outcomes). For the present study, parental interactions, work experience, and personal characteristics were the inputs; financial knowledge and financial attitudes were the throughputs.

Second, Social Relational Theory by Kuczynski & Demol (2014), which states that both the parent and child are recognized as social agents embedded in relationships. Change and development occur in the course of dealing with contradictions or competing goals or needs. This theory embraces the fact that parenting is inherently dynamic. There are constant changes occurring that require cognitive or behavioral adjustments. Child rearing is also characterized by frequent conflicts (e.g. parent vs child needs), expectations (broken as well as met), ambivalence (in the face of competing goals), and ambiguity (e.g. unsure about how the child will behave in the future). Consequently, this theory considers the cognitive demands involved in parenting (such as problem solving to resolve conflicts) a central process in child rearing.

The theories may relate to the statement of the problem and conceptual framework of study. Whereas, the gathered data were based on facts, knowledge gained through interviews and conversational analysis. Thus, theories are related to the study because it helps explained the struggles of parents.

Statement of the Problem

This study aimed to determine the struggles of parents with pregnant teenage daughters amidst COVID-19 Pandemic.

Specifically, it sought to answer the following questions:

1. What are the struggles of parents in terms of;
   a. Financial concerns
   b. Social issues/concerns
   c. Emotional struggles
   d. Mental state challenges
2. How did parents overcome the challenges towards supporting their teenage daughter during pregnancy and after giving birth?
3. What are the realizations of parents?

Scope and Delimitation of the Study

This study entitled "Struggles of Parents with Pregnant Teenage Daughter Amidst COVID-19 Pandemic" was limited and focused mainly on determining the struggles of parent in terms of financial concern, social issues/concern, emotional struggles, and mental state challenges. This also included in the finding answers on how parents overcome the challenges and their realization in life. In analyzing the result, the researchers used qualitative kind of research.

The participants of the study were the five (5) parents from the municipality of Miagao, Iloilo and was selected based on the set qualifications. They should be a registered 4P's member, should be both parent (mother and father), earning a monthly income ranging from ₱5,000-8,000, and most especially having pregnant daughter ages 13 to 19 years old. The participants undergone face to face interview and followed the standard safety and health protocols.

This study did not cover other problems that are not considered and related to parents that are fit to the following qualifications. By this strategy the researchers would be able to know the struggles of parents with pregnant teenage daughter amidst COVID-19 pandemic.

Significance of the Study

This qualitative study aimed to determine the struggles of parents with pregnant teenage daughter amidst COVID-19 Pandemic. Therefore, the result of this study would have a beneficial significance to the following:

1. Parents- They would be more vigilant in educating their children's particularly their daughters to avoid early sexual engagement with their partners.
2. Teenagers- This study would provide relevant information and offer awareness of what would be the consequences of their actions that could specifically affect their parents and family members.
3. Society- This study would serve as a stimulus for the awareness of how teenage pregnancy affects the members of the family.

4. Department of Social Welfare and Development (DSWD)- The institution can help strengthen programs that can help cater the needs of families with pregnant teenage children and establish awareness programs for young children's and their family.
5. Department of Health (DOH)- The agency can develop aggressive strategies to implement programs in preventing early pregnancy specifically programs educating the youth on the direct effect of early pregnancy in social, emotional and psychological aspect to both teenagers as well as to their parents.
6. National Youth Commission (NYC)- This study was beneficial in strengthening their awareness and programs towards teenage pregnancy, as it was a national emergence problem here in our country.
7. ISAT-U Program/Extension- This study was helpful to the faculty and staffs of the school, for the different understanding of the struggles of parents having a pregnant teenage daughter. The university can also develop extension programs that can reach out to the family and train to improve their financial issues.
8. Future Researchers- The result of this study could serve as reference for future studies.

Methodology

Research Method. The research method implied in this study was the qualitative research using in-depth interview which defined by Boyce & Neale (2006), as qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation.

Wherein, the researchers asked the participants about their experiences and thoughts concerning their struggles and on how they overcome the challenges and their realizations in life brought by the situation. This was done through personal interview and purely conversational method used to acquire in-depth information of parents having pregnant teenage daughter amidst Covid-19 pandemic.

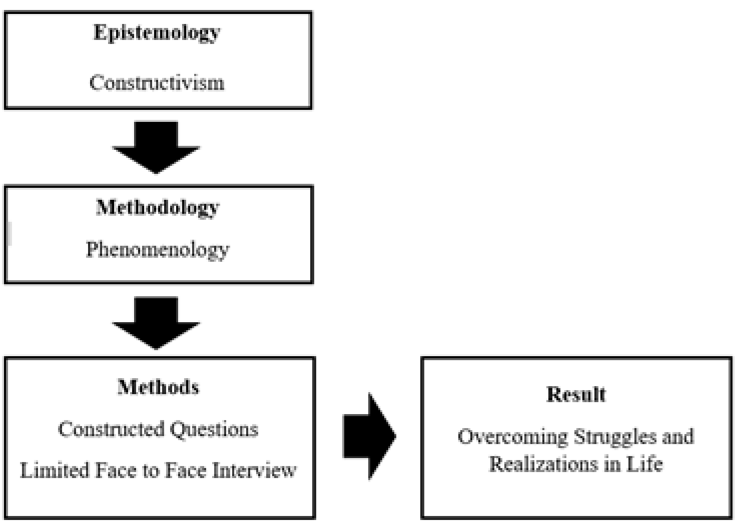

Figure 2: Flowchart of the Research Process and Method

Figure 2 illustrates the procedure in a qualitative method. It shows the relationship among Constructivism as epistemology, Phenomenology as methodology, Constructed Questions and Limited Face to Face Interview as Methods, and Overcoming Struggles and Realizations in Life as Result.

The epistemology used in the study is Constructivism. Constructivism (also known as Constructionism) is a relatively recent perspective in Epistemology that views all of our knowledge as "constructed" in that it is contingent on convention, human perception and social experience. Therefore, our knowledge does not necessarily reflect any external or "transcendent" realities. (Harvey, 2012)

Research Design. In this study, the researchers used a Phenomenology research design. According to Deakin University Library (2021), phenomenology research design or now called Descriptive Phenomenology, this study design is one of the most commonly used methodologies in qualitative research within the social and health sciences. It is used to describe how human beings experience a certain phenomenon. It attempts to set aside biases and preconceived assumptions about human experiences, feelings, and responses to a particular situation.

Participants of the Study. The participants of this study were five (5) parents from the municipality of Miagao, Iloilo and were fit to the following qualifications set by the researchers; earning a monthly income ranging from ₱5,000-8,000, should be both parent (mother and father), a Pantawid Pamilyang Pilipino Program beneficiary or commonly known as 4P's member, and with pregnant teenage daughter ages 13 to 19 years old that would represent the population.

Data Gathering Instrument. The data gathering instrument of this study was a researcher-made interview guide which consisted of three parts (3). Part I of the research instrument comprises of the items which gathered participants' profile such as name, address, occupation, economic income and the set qualifications (a 4P's member, earning a monthly income ranging from ₱5,000 to 8,000, should be both parent and are having a teenage pregnant daughter). Part II of the research instrument consists of the questions that contains number from 1 to 19 with follow up questions if needed. For validation purposes, the researchers submitted a sample of the set of administered questionnaires to the selected validators whom the researchers believed where experts in this study for content and face validation. Part III of the research instrument is the audio recorded interview that was assisted by the researchers.

Data Gathering Procedures. The researchers determined the participants that corresponds to the qualifications of the study. The researchers secured a permit in conducting the study comprising the following; letter for participant's and letter for the Barangay Captain. Since the target participants are identified, the researchers done a courtesy visit to the Barangay Captain and asked permission to conduct a face-to-face interview to the selected participants. A personal audio recorded interview was conducted with the participants.

The participants were oriented of the purpose of the interview, briefed on the salient points of the ethical concerns of the interview and assured of their confidentiality. Thereafter, the data collected was transcribed.

Data Processing Techniques. For the phenomenological study, the data gathered were transcribed and themes are formed for the discussion of the results.

Describing how any one participant experiences a specific event is the goal of the phenomenological method of research. This method utilizes interviews, observation and surveys to gather information from subjects which is highly concerned with how participants feel about things during an event or activity. (Leonard, 2019)

Interview, Conversational Analysis and Theme Identification were used as methods in this study.

Interview is a conversation; whose purpose is to gather descriptions of the [life-world] of the interviewee with respect to interpretation of the meanings of the described phenomena. (Kvale, 1996)

Conversation analysis is an approach to the study of social interaction and talk-in-interaction that, although rooted in the sociological study of everyday life, has exerted significant influence across the humanities and social sciences including linguistics. (Sidnell, 2016)

Theme identification is one of the most fundamental tasks in qualitative research. It also one of the most mysterious. Explicit descriptions of theme discovery are rarely described in articles and reports and if so, are often regulated to appendices or footnotes. (Ryan & Bernard, n.d.)

Results and Discussions

This chapter presents the results of the study and it underwent two methods: conversational analysis and thematic identification.

Qualitative Results

Themes Emerged from the Conducted Interview and was based on the common answers of the participants.

THEMES

Statement of the Problem No. 1: Struggles of Parents

Financial Concerns
Money often costs too much- Ralph Wald Emerson

Parents are responsible in supporting their children throughout their daily needs, therewith, is a need of money to buy such necessities. Families who are earning an income ranging from ₱5,000- 8,000 encountered hardships in making ends meet. Having a pregnant teenage daughter adds more financial constraints. Based on our interview, most of the parents founds burden in supporting their pregnant daughter financially. According to nanay Felicita, "pinansyal gid eh.. kwarta gid.. kulang gid. Nangutang lang gani ako kang pag-bata na para preperasyon bala kay teh syempre duro pa daan kan on na kara. Kang pagbata na nangita gid ako kang paagi kung daad dar on tana sa western e cesarian teh wara man kay na okay man kay daw nakaya naman teh daw gamay malang man ang gin gasto namon." (It's financial. it's money. it's not enough. I only borrowed when she was about to give birth to prepare because of course she still has a lot to eat. When she was giving birth, I really looked for a way if I could take her to Western hospital for a cesarean but after all she carried to give birth normally because she said it was okay so it seems like we only spent a little). Another example was Nanay Sonya told us that after her daughter gave birth, she wrestled in providing the needs of her granddaughter particularly in buying milk for formula feeding since her daughter can't breastfeed after giving birth. Nanay Tinay was exasperated because their family only relies to the income of her husband which is not even enough for their family. They had to find means in order to support their growing family, at the same time support the medical and labor needs of their teenage daughter. She added, that the supposed allocation for her medical necessities was spent in the parturition of her daughter.

On the other hand, some parents' financial woes were lesser because of financial support provided by the members of the family, relatives and the father of the child.

Social Issues/ Concerns
The world may shut us down but our family will stick together

Given the scenario of a teenage pregnant daughter, it is notably for the parents a worldwide shattering event. They have difficulty directly assaulted by all the social pressures and prejudices of the people they live with. They have been rejected, judged and listened to by family and neighbors. According to the results of the consolidated interview, the majority of the parents, especially tatay Dodong, nanay Felicita, and nanay Timay, were questioned and blamed by their other children. Other siblings and relatives have questioned their family's determination to assist their pregnant daughter. As what nanay Felicita said, "si nanay amo ra nag sakit man buot na kay tungod sa ano bata pa. Ang bugto na nga sara nagabasol man nga nag amo bala kara teh anhon mo ra kay jan dun wara ta dun teh mahimo." (My mother was upset because she was too young to get pregnant. Her brother, on the other hand, blames her for why she became like that, but what else we can do since it already happened, we can't do anything). On the other side, the participants had only minor difficulties with blame and confusion from their family. This family learned to accept the circumstance and assist the family later on.

Most of the parents, particularly Nanay Sonya, Nanay Felicita, and Nanay Nena, have stated that during the height of the issue, they were the topic of neighborhood gossips and hearsays. Moreover, with regards to their neighbors, nanay Felicita said, "Wara, wara ako ga pasulod kang mga istorya kang mga tawo naga aw bukot lang man teh kita ang naga amo kara abi kag sara pa wara man kita naga ano kananda jan kara. Anuhon mo ra teh kung masarangan naton teh masarangan. Teh amo ra ang pagdalagan naton sa mga parehas naton nga ga pangayo ka bulig." (Nothing, we don't mind the hearsays of other people, why? Since, we are not only the ones who experienced like that and we are not interfering with them. What else we can do, we will do what we can do and that's the time we can run with our peers who beg for help). Despite the fact that it has damaged them emotionally and caused them to feel wounded by what others say, they have learnt to accept reality and the troubles had typically died on their own.

Teenage pregnancy in the family undermines the fundamental core of the family. The world comes to a halt, especially for parents who had great hopes for their children. The father is badly hurt because he has high hopes for his beloved daughter. But, as what they said that in good and terrible times, they must remain together and hold on so that they can withstand anything. Regardless of what the world has said about them, as long as their family is together, they had the fortitude to move on and live their lives.

Emotional Struggles
No matter what happens she is my child.

When the parents found out their daughter was pregnant, they were both embarrassed and upset since they did not expect it to happen, especially at such a young age. As a result of our interview with our participants, we discovered a situation where they blame their daughter and themselves as parents for their daughter's terrible condition. To the point where they became enraged and questioned what responsibility as a parent they had neglected. According to nanay Magda "Una syempre di ko mabaton naka-batyag ka kang daw kahuya kung ano ang discrimination kang tawo but then rako man naga advice nga te anhon mo nga diyan ron ra wara te sala ang bata amo kara kag luwas kara palangga ko man bata ko ey. Te indi ko man pedi pabay-an kaya ginhimo ko tanan kung ano makapamayad kana." (At first, I can't accept it...I felt ashamed about the discrimination subjected by people around us but then many people advised me that the unborn child is innocent other than that I love my daughter. I will not neglect her so I did everything for her own good).

Nanay Sonya and Nanay Timay has learned to just accept the fact of their daughters' pregnancy. Some parents find other means to handle the situation like listening to the advices of other people towards giving a better care to their daughter. They talked to their daughters privately and to the father of a child. They have also opted to talk to the parents of the man who's fathering their daughters' child. They have made to agree on how to support the situation and move on. To show support and love to their daughters, the parents set aside their feelings of disappointment and embarrassment. They had made this sacrifice just to uplift the child's welfare by accepting the mistake of what the child had been through.

Mental State Challenges
Our world shattered in front of us

Every parent's initial thought is what is best for their children. They work tirelessly to assist and provide the finest possible life for every child. Parents who discovered their daughter was pregnant at a young age describe the experience as if the world had shattered in front of them. Their hopes and plans for their children flew out the door. They examined themselves to see whether they had done anything wrong. As a result, during the interview, most of the parents cried foul at learning that their daughter was pregnant. They are mentally mute as a result of the circumstance. Just like what Nanay Magda said "Daw amo ra ang pinaka ko gid ka ano nga daw tinakluban ako ka langit, daw indi ko na expect bala nga mahimu ka bata ko" (That is the most that seems like I was covered by sky, that I did not expect that my daughter will do such kind of thing). It was impossible to deny that as a parent, they have been disappointed and humiliated. It was impossible to deny that disappointment may be written all over a parent's face after knowing the problem that had shattered their mind instantly. After they heard the news, was like a bomb that unexpectedly burst in front of them having no idea of what they are going to do. This might be the most difficult task for any parent, because after all their mind was still focused on their responsibility of what they will do next as a guardian and parent to their daughter.

Statement of the Problem Number 2: Overcoming Challenges

Acceptance
It hurts; but a parent's unconditional love heals

It is natural for a family to face difficulties throughout their lives. Acceptance by parents was never simple at first since there were ideas and inexplicable feelings that ran out after learning about their daughter's early pregnancy. In terms of finances, parents carry the duty of financially supporting their daughter in order to meet her necessities, thus complicating the issue at this trying period caused by the Covid-19 pandemic. Regardless of the financial difficulties that they encounter, as a parent with numerous obligations. They must embrace the reality that their daughter is pregnant by providing financial support and help during and after the delivery. As a result, in terms of societal issues, parents experienced situations inside the family, particularly those parents who had the eldest child who resented their sibling for getting pregnant at such a young age. However, the immediate family accepts the circumstance with the awareness that the deed was committed. They chose not to care what their neighbors thought or how they reacted to them. As a result of their emotional struggle, they felt ashamed and disturbed about the circumstance. Knowing that their daughter is pregnant at such a young age. They embrace it, and their unconditional love for their daughter gives them the strength to endure all of life's challenges.

Adjustment
A child is always a blessing

Every family, disputes and battles are inescapable. They may have problems in resolving such uncertainties, but they approach them with affirmation and bravery in conquering the obstacles that life had thrown to them. In a family circumstance when they have a pregnant daughter who is at an unexpected age to experience pregnancy. They are the ones who are more impacted and responsible in that particular position. In such a manner that their way of life changes from what they were accustomed beforehand. On the other hand, in financial matters, priorities shift, with more emphasis placed on the needs of their daughter's pregnancy, during and after giving birth. For example, savings that were supposed to be destined for their daughter's future are now used to cover the emergency bills of their daughter's pregnancy. Then, in terms of social aspects, they just ignored other people's opinions regarding the pregnancy matter because of the fact and they cannot dispute the circumstance. Furthermore, even though they felt humiliated, angry, and discouraged about what their daughter did. They pushed those sentiments aside for the good of their daughter and themselves. Consequently, in terms of mental state, despite what happened to their daughter, they uphold the mindset that they are parents who are responsible for their daughter. That they will never abandon their child in the trying times of their adolescent life, and to let themselves forego the disappointment they had gone through. In any unforeseen scenario, such as a teenage pregnancy. Parents will always care after their child's welfare and driving to transform the situation into a good atmosphere. After all, they saw that their grandchildren were a blessing that could provide strength and happiness to the family at the end of the day.

Moving on
Let go and start a new beginning

Getting rid of the past and living in the current moment is sometimes necessary. However, what has already been done cannot be restored. As a result, start a new one as soon as possible. Most parents say they cannot undo what was already been done; at first, they struggle to accept the repercussions of their daughter's reckless behavior. But at the end, they focused on what will happen in the future, the solution, and moving forward. Parents go to great lengths to help their children overcome the challenges they face, and they are always eager to assist. We can see from the responses of the participants that no matter what happen, parents are still parents. As their love for their children is unconditional, and forgiveness and acceptance are open despite their daughters' faults and inadequacies. The researchers may conclude that the only way for families to go ahead is to let go of what they cannot alter.

Statement of the Problem Number 3: Realizations in Life

Situation
Selfless Love of Parents

A person's or an individual's responsibility is something that is placed on their shoulders. As a parent, your responsibility includes not just providing for your family's necessities, but also guiding and supporting your children financially, emotionally, socially, and mentally. Even though they were exhausted, they continued to fulfil their parental responsibilities in order to provide the best possible care for their children. In a scenario of a parent with a daughter who became pregnant at an unexpected age. The difficulty will be twofold, and their thoughts will be multiplied, for the sake of their daughter's condition. They begin their day with persistence and courage in order to deal with the situation and the people around them. No matter how heinous their daughter's action was. Their responsibility as a parent will never end, but it will become folded. In terms of mental health, parents will remain focused on ensuring that the situation does not worsen and will consider alternative ways to improve the lives of their daughter and their grandchildren. It may be difficult to accept at first, but they are still parent who will lead and support their daughter in her new life adventure. In terms of emotional condition, hurt will remain, but at the end of the day, they will still have the love and tranquillity to embrace life with the new member of the family. In terms of finances, no matter how impoverished their lives are, they never stop working. Even if they only earn a tiny amount of money to provide for their daughter's pregnant concerns. In this type of circumstance, parents will be the most impacted socially. Hence, they standstill as parents who will defend their daughter and just face the judgment since it is the reality and the things that happened will never change. A parent's responsibility is everlasting. No matter how difficult the circumstances, a parent's commitment will never diminish. They may be unhappy at first, but they cannot stand seeing their children suffer from the consequences of their careless actions.

Relationship
Communication is the key

Open communication is one method of connecting people at home by bridging confusions and answering questions that each and every member has. With the passage of time and the development of maturity. Children in the family may sense hesitation. In this study, the closeness of the parent-child relationship grows as the child shares and consults his or her problems with their parents. With whom they have a good relationship and whose parents are always concerned about their children's well-being. However, as a result of the interview, when it comes to personal problems, most children's keeps them secretly within themselves. In spite of how well communication is formed within the family. Time comes that a barrier can be built between parents and children, especially if the issue is very personal and can create problems within the family.

Themselves
We will never give up on our children

A parent's involvement is essential at home. They make every effort for the wellbeing of their children. Time passes and we cannot deny that the child will take a different route and act contrary to what is expected to them. The parents felt terrible that their efforts and advice would be for naught since they wanted their children to focus and finish their studies first and foremost. But then, their daughter became pregnant at a young age. Even the parents would provide everything to their children. There were instances that the child itself would not mind the advices of their parents towards giving them a better and brighter future. They didn't value the hardships and they only look for their own happiness and contentment without considering the plans of their parents for the sake of them.

The researchers recognized how the scenario had resulted in difficult experiences for parents, particularly it happened during a period of global health crisis the Covid-19 pandemic. Researchers have shown that even parents are affected by their child's early pregnancy. However, the parenting role of parents stays at hand. Regardless of how terrible the circumstance was, they always look for their child's welfare. On the other hand, it puts their courage, commitment, and sense of duty to the test at that moment. During the interview, the researchers observe how the parent's emotions change as if they undergone and surmount the struggles brought by their pregnant daughter. Through their unspoken eyes, it can be seen how they hold the wanted tears to fall down. That was simply decipherable how they don't want that situation to happen, having the disappointment felt by them. The situation had driven the parents to suffer especially this was happened during the most difficult situation-the circumstances brought of Covid-19 Pandemic. Every time they utter a single word coming from their expressive mouth. The researchers could simply hear a stammering voice because of so much emotions, and thoughts prompted by their daughter's unfavorable situation. Knowing how deeply affected they are by the situation but they uphold the unconditional affection and the responsibility with themselves. They were able to cope up and fought the challenges thrown to them.

Conclusion and Recommendations

Conclusion

In view of the findings of the study, the following conclusion were drawn;

a. It was shown that the majority of parents felt the anguish and hardship of their teenage daughters' early pregnancy in all parts of life, particularly in terms of financial concerns, social issues/concerns, emotional struggles, and mental state challenges. Despite all, parents have triumphed over society's misconduct and the agony of expectations that have previously been let down.

b. Moving on from the harsh reality of the teenage daughters' pregnancy took a lot of effort and courage. With love and acceptance, the family can start a new chapter of their lives.

c. Family bond and openness within the family circle makes a lot of difference. In this setting, it is the strong parental love that allowed these parents to give second chances to their daughters.

Recommendations

Based on the findings and conclusions the following recommendations are hereby presented:

a. For Parents. Time and dedication towards parenting are crucial to the development of children. Teach them to fly on their own but never forget to mentor them how to land correctly on the right destination.

b. For Teenagers. Teenagers needs to know their limitations and responsibility in life. To fulfill each dreams and ambitions, they need to be passionate of their dreams. They should be responsible of their actions and the risk it may bring to their family.

c. For Society. To continue in supporting programs or symposiums about the effect of teenage pregnancy most especially on bringing awareness on the disadvantages of early pregnancy particularly to parents, young children and its impact to the society as well. It is also important for them to develop and get engaged with several activities concerning to responsible parenthood.

d. For Department of Social Welfare and Development (DSWD). To continue in strengthening and developing programs and policies implemented for the purpose of early preventions as well as to support responsible parenting in order to combat teenage pregnancy.

e. For Department of Health (DOH). To continue in implementing programs to prevent early pregnancy specifically programs educating the youth on the direct effect of early pregnancy in social, emotional and psychological aspect to both teenagers as well as to their parents.

f. For National Youth Commission (NYC). To continue the legacy on raising consciousness and awareness about youth concerns. Just like the prevalent teenage pregnancy here in our country.

g. For ISAT U Programs/Extension. As teenage pregnancy is very rampant in our university, and is the second home of teenagers for their first step on achieving their dreams. May they will be inspired to improve and widen to conduct new study related to this kind of research. That they may exposed to other interest about parental struggles to further use them in education leading to meaningful realizations. Likewise, they must strengthen their programs in relation to sex education and conduct symposium to give awareness to students on the effect of teenage pregnancy.

h. For Future Researchers. That they would be motivated to look into and explore studies about parental struggles on another situation aside from Covid-19 pandemic.

Acknowledgement

The researchers would like to express their deepest gratitude and sincere appreciation to those who in one way or the other contributed to the fulfilment of this study.

First and foremost, to the Almighty God, for the wisdom, guidance, enlightenment, love and for giving His abundant blessings and graces and who continues to direct and assists the researchers from the beginning until the completion of the study;

Dr. Sandra T Examen, Campus Administrator, for giving the researchers the opportunity and for allowing them to conduct this study despite of the occurrence of Covid-19 Pandemic;

Prof. Rey Jay N. Palmos, Research Instructor, for his time, knowledge, and support proffered for the accomplishment of this study;

Mrs. Geraldine F. Morano, Research Paper Adviser, for spending her valuable time checking the manuscript and helping the researchers come up with a very good study. Likewise, for the unending patience, encouragement and selfless assistance in imparting her knowledge and for the motivations that inspire the researchers to continue;

The Research Paper Panelist, Mr. Niño M. Legaspi and Mr. Vic Bonda, who devoted their time and wisdom and for giving their suggestions that could serve as basis for the researchers to significantly improve the study;

The Barangay Captains, for giving full consideration by permitting the researchers to conduct the face-to-face interview given the pandemic;

The Participants, for spending their valuable time and presence during the conduct of the interview as well as for their cooperative and honest response to the questions, asked by the researchers;

The researcher's siblings and parents/guardians, for faithfully providing the research with moral and financial support, inspiration, encouragement, guidance, and love throughout their research journey;

Lastly, the researcher friends and classmates and whose names were not mentioned but had greatly help in the fulfilment of the study, for the whole hearted support, encouragement, and understanding that made the researchers committed to fulfil the task.

Thank you very much and more power!

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Adapting to the New Normal: Teacher's Preparation, Student's Academic Performance, and Challenges Encountered

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Abstract - Teacher preparation plays a significant role in the teaching and learning process delivered to the students during the pandemic. This paper examines the adaption of a flexible learning approach in teacher preparation, students' academic performance, and challenges encountered by students and teachers. A sequential explanatory mixed-method design was utilized in which a survey was done followed by an in-depth interview. The results showed that teachers were prepared, and student's academic performance was very good. Teachers and students shared their preparations, experiences, learnings, challenges encountered, and coping mechanisms. Teachers showed significant preparedness to face the challenges encountered. Teachers showed compassion and determination to deliver their lessons and make students learned. Students believed that teacher preparation helped build their cognitive knowledge and understanding. Teachers and students need to work hand in hand for the teaching and learning process will be meaningful and fruitful.

Keywords - New Normal, Teacher Preparation, Students Academic Performance, Challenges Encountered, Flexible Learning

Introduction

Given the current situation, focusing on the well-being of the students will be necessary, especially their education during the start of the academic year. The adaptation back to university is always just that — an "adaptation" — and this academic year brings unprecedented challenges. When students have predictable routines, feel cared for, and have a sense of safety, they have a stronger foundation to learn. Ensuring that there is a balanced approach to the curriculum that acknowledges the importance of supporting students' well-being during the start of the academic year will be necessary.

Teachers are working hard and balancing multiple responsibilities. Teachers as second parents to students who remember to be kind and patient with themselves, reach out for support when needed, can more effectively care for their students, and model positive coping strategies as required for this pandemic.

Teacher preparation plays a vital role in the quality of education delivered to the students this time of the pandemic. High-quality teacher preparation provides students with the opportunity to apply what they have learned from the module or online to their community or home, to gain hands-on experience at home or virtual experience in a virtual classroom, and to work directly with peers virtually that will serve as a temporary workplace for students. While research on teacher preparation is limited, there is a positive connection between teachers' preparation in their subject matter and their performance. For example, fully prepared special education teachers are not only more likely to remain in the profession; they're also improving outcomes for students with disabilities (Holdheide, 2020).

With the uncertainty around the 2020-2021 academic year, it is perhaps even more critical to ensure that University Faculties are prepared to take on the challenges that await them. According to Holdheide, teacher preparations respond to the coronavirus pandemic and share some innovative school districts. The current pandemic has affected education, work, socialization, everyday life, economy, and health care. One day, we will be able to go back to our former way of life simply. These challenging times have brought change for each of us, and now it is up to us to see how we can contribute, be innovative and responsible, and jointly work for a better tomorrow (Softic, 2020).

Methodology

This study undertakes the sequential explanatory mixed-method design where the quantitative phase (numbers) was followed by the qualitative phase (personal experience) (Creswell, 2013), where the qualitative findings are used to contextualize the quantitative data (Creswell et al., 2003). Qualitative data can also enhance and enrich the results (Taylor & Trumbull, 2005; Mason, 2006) and help generate new knowledge (Stange, 2006).

The study participants were determined using Slovin's formula in the quantitative phase of this study. At the same time, one (1) student-participant per program degree and one (1) teacher-participant per program degree will be interviewed.

The researcher-made survey instrument was used to gather data regarding teacher's preparation. At the same time, students' Final Grade at the end of the first semester was utilized to analyze students' academic performance. The quantitative data were analyzed using Mean, Percentage, Standard Deviation, Kruskal-Wallis Analysis of Variance, Spearman Rho Signed Rank. On the other hand, an in-depth interview was done with selected student-participants and teacher-participants using researcher-made guide questions. Consent forms were distributed to the participants for Ethical considerations. The qualitative data were analyzed using Thematic Analysis by (Braun & Clarke, 2006).

Results and Discussions

The Commission on Higher Education (CHED) introduced Flexible Learning to State Universities and Colleges in the Philippines as a teaching and learning approach in this pandemic, which has two options: synchronous and asynchronous mode or combination students will choose. The findings below in Table 1 showed the level of teacher preparation during the implementation of flexible learning when grouped by department and as a whole.

Table 1. Level of Teacher Preparation during the Implementation of Flexible Learning.

Category	Mean	SD	Description
As a whole	3.72	1.26	Prepared
Subcomponents			
Technology Access	3.83	1.20	Prepared
Teaching Styles and Strategies	4.10	1.21	Prepared
Course Planning and Time Management	3.18	1.25	Moderately Prepared
Course Design	3.79	1.18	Prepared
Program			
BSEd	4.43	0.56	Highly Prepared
BEEd	3.22	1.53	Moderately Prepared
BTVTEd/BTLED	4.17	1.00	Prepared
BS IT	3.22	1.63	Moderately Prepared
BS IS	3.95	1.16	Prepared
BS HM	3.43	0.98	Moderately Prepared
BS TM	3.97	1.03	Prepared
BS ENTREP	3.74	1.18	Prepared
BIT	3.41	1.32	Moderately Prepared

Teachers are new to this approach. Preparation needs to be strengthened for this approach to be implemented effectively. This research examined the adaptations of the flexible learning approach in terms of teacher preparation, students' academic performance, and challenges encountered during the implementation.

Based on Table 1, teachers were Prepared (M = 3.72) when grouped as a whole. When grouped by programs, Bachelor of Secondary Education (BSEd) was Highly Prepared (M =4.43) while Bachelor in Elementary Education (BEEd), Bachelor of Science in Information Technology (BS IT), Bachelor of Science in Hotel Management (BS HM), and Bachelor in Industrial Technology (BIT) was Moderately Prepared (M[BEEd] = 3.22, M[BS IT] = 3.22, M[BS HM] = 3.43, and M[BIT] = 3.41).

Looking at the subcomponents, Teachers were Prepared in terms of Technology Access (M = 3.83), Teaching Styles and Strategies (M = 4.10), and Course Design (M = 3.79). In contrast, Teachers were Moderately Prepared in Course Planning and Time Management (M = 3.18).

On the other hand, Table 2 below presented the level of students‘ academic performance during the implementation of flexible learning by program.

Table 2. Level of Students ‘Academic Performance during the Implementation of Flexible Learning.

Category	Academic Performance (Mean Equivalent Grade)	Description
As a whole	90	Very Good
Program		
BSEd	90	Very Good
BEEd	90	Very Good
BTVTEd/BTLED	89	Very Good
BS IT	91	Very Good
BS IS	89	Very Good
BS HM	90	Very Good
BS TM	88	Very Good
BS ENTREP	89	Very Good
BIT	90	Very Good

Based on table 2 above, the level of students academic performance was Very Good when taken as a whole. When grouped by progam, All programs got a result of Very Good which simply showed that despite of the pandemic situation, students were able to cope up with their academics. In Table it showed the significant difference in the level of teacher preparation during the implementation of flexible learning.

Table 3. Significant Difference in the Level of Teacher Preparation during the Implementation of Flexible Learning.

Category	Chi-square	df	Sig.
As a whole	11.114	8	0.195
Subcomponents			
Technology Access	15.893	8	0.044
Teaching Styles and Strategies	6.219	8	0.623
Course Planning and Time Management	16.528	8	0.035
Course Design	7.986	8	0.435

A Kruskal-Wallis H Test showed that there was a statistically significant difference in the subcomponents, Technology Access between the different programs, X2(2) = 15.893, p = 0.044, and Course Planning and Time Management between the various programs, X2(2) = 16.528, p = 0.035. In contrast, Teaching Styles and Strategies and Course Design have no significant differences among programs. The Post Hoc Test using LSD was run to determine which programs were significant differences occurred under Technology Access and Course Planning and Time Management. Table 4 showed the Post Hoc Test of Technology Access results by programs that showed a significant difference.

Table 4. Post Hoc Test using LSD in Technology Access.

Multiple Comparisons
Dependent Variable: Technology_Access
LSD

(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	Sig.
BSEd	BIT	18.33333*	5.95871	.007
BEEd	BS IT	-14.33333*	5.95871	.027
BTVTED/BTLED	BS IT	-13.00000*	5.95871	.043
BS IT	BEEd	14.33333*	5.95871	.027
	BTVTED/BTLED	13.00000*	5.95871	.043
	BIT	20.66667*	5.95871	.003
BS IS	BIT	18.33333*	5.95871	.007
BIT	BSEd	-18.33333*	5.95871	.007
	BS IT	-20.66667*	5.95871	.003
	BS IS	-18.33333*	5.95871	.007

*. The mean difference is significant at the 0.05 level.

Table 4 above showed a significant difference between BSEd and BIT programs, BEED and BS IT programs, BTVTED/BTLED and BS IT programs, BS IT and BIT programs, and BS IS and BIT programs. Table 5 below presented the Post Hoc Test using LSD in Course Planning and Time Management.

Table 5. Post Hoc Test using LSD in Course Planning and Time Management.

Multiple Comparisons
Dependent Variable: Course_Planning_and_Time_Management
LSD

(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	Sig.
BSEd	BEEd	16.66667*	5.85420	.011
	BS IT	26.00000*	5.85420	.000
	BS IS	13.33333*	5.85420	.035
	BS HM	20.33333*	5.85420	.003
	BS ENTREP	19.00000*	5.85420	.004
	BIT	17.33333*	5.85420	.008
BEEd	BSEd	-16.66667*	5.85420	.011
	BTVTED/BTLED	-15.66667*	5.85420	.015

BTVTED/BTLED	BEEd	15.66667*	5.85420	.015
	BS IT	25.00000*	5.85420	.000
	BS IS	12.33333*	5.85420	.049
	BS HM	19.33333*	5.85420	.004
	BS ENTREP	18.00000*	5.85420	.007
	BIT	16.33333*	5.85420	.012
BS IT	BSEd	-26.00000*	5.85420	.000
	BTVTED/BTLED	-25.00000*	5.85420	.000
	BS IS	-12.66667*	5.85420	.044
	BS HM	-5.66667	5.85420	.346
	BS TM	-14.66667*	5.85420	.022
	BIT	-8.66667	5.85420	.156
BS IS	BSEd	-13.33333*	5.85420	.035
	BTVTED/BTLED	-12.33333*	5.85420	.049
	BS IT	12.66667*	5.85420	.044
BS HM	BSEd	-20.33333*	5.85420	.003
	BTVTED/BTLED	-19.33333*	5.85420	.004
BS TM	BS IT	14.66667*	5.85420	.022
BS ENTREP	BSEd	-19.00000*	5.85420	.004
	BTVTED/BTLED	-18.00000*	5.85420	.007
BIT	BSEd	-17.33333*	5.85420	.008
	BTVTED/BTLED	-16.33333*	5.85420	.012

*. The mean difference is significant at the 0.05 level.

Based on Table 5 above, the results showed that there was a significant difference between BSEd and BEEd programs, BSEd and BS IT Programs, BSEd and BS IS programs, BSEd and BS HM programs, BSEd and BS ENTREP programs, BSEd and BIT programs, BEEd and BTVTEd/BTLEd programs, BTVTEd/BTLEd and BS IT Programs, BTVTEd/BTLEd and BS IS Programs, BTVTEd/BTLEd and BS HM Programs, BTVTEd/BTLEd and BS ENTREP Programs, BTVTEd/BTLEd and BIT Programs, BS IT and BS IS programs, BS IT and BS HM programs, BS IT and BS TM programs, and BS IT and BIT Programs in Course Planning and Time Management. On the other hand, Table 6 presented the significant difference in the level of student academic achievement during the implementation of flexible learning.

Table 6. Significant Difference in the Level of Students' Academic Performance during the Implementation of Flexible Learning.

Category	Chi-square	df	Sig.
As a whole	110.801	8	0.000

Based on the Kruskal-Wallis H Test, there was a statistically significant difference in the level of students' academic performance between different programs, X2(2) 110.801, p = 0.000. This showed that there was a difference in each student's academic performance per program. Using the Post Hoc Test LSD, some programs had significant differences in the level of students' academic performance during the implementation of flexible learning, as shown in Table 7 below.

Table 7. Post Hoc Test using LSD in Students' Academic Performance.

Multiple Comparisons
Dependent Variable: Students_Academic_Performance
LSD

(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	Sig.
BSEd	BEEd	.53846*	.24146	.026
	BTVTED/BTLED	1.46154*	.24146	.000
	BS IS	1.00000*	.24146	.000
	BS HM	.58974*	.24146	.015
	BS TM	1.69231*	.24146	.000
	BS ENTREP	1.25641*	.24146	.000
BEEd	BSEd	-.53846*	.24146	.026
	BTVTED/BTLED	.92308*	.24146	.000
	BS IT	-.79487*	.24146	.001
	BS TM	1.15385*	.24146	.000
	BS ENTREP	.71795*	.24146	.003
BTVTED/BTLED	BSEd	-1.46154*	.24146	.000
	BEEd	-.92308*	.24146	.000
	BS IT	-1.71795*	.24146	.000
	BS HM	-.87179*	.24146	.000
	BIT	-1.05128*	.24146	.000
BS IT	BEEd	.79487*	.24146	.001
	BTVTED/BTLED	1.71795*	.24146	.000
	BS IS	1.25641*	.24146	.000
	BS HM	.84615*	.24146	.001
	BS TM	1.94872*	.24146	.000
	BS ENTREP	1.51282*	.24146	.000
	BIT	.66667*	.24146	.006
BS IS	BSEd	-1.00000*	.24146	.000
	BS IT	-1.25641*	.24146	.000
	BS TM	.69231*	.24146	.004
	BIT	-.58974*	.24146	.015
BS HM	BSEd	-.58974*	.24146	.015
	BTVTED/BTLED	.87179*	.24146	.000
	BS IT	-.84615*	.24146	.001
	BS TM	1.10256*	.24146	.000
	BS ENTREP	.66667*	.24146	.006
BS TM	BSEd	-1.69231*	.24146	.000
	BEEd	-1.15385*	.24146	.000

	BS IT	-1.94872*	.24146	.000
	BS IS	-.69231*	.24146	.004
	BS HM	-1.10256*	.24146	.000
	BIT	-1.28205*	.24146	.000
BS ENTREP	BSEd	-1.25641*	.24146	.000
	BEEd	-.71795*	.24146	.003
	BS IT	-1.51282*	.24146	.000
	BS HM	-.66667*	.24146	.006
	BIT	-.84615*	.24146	.001
BIT	BTVTED/BTLED	1.05128*	.24146	.000
	BS IT	-.66667*	.24146	.006
	BS IS	.58974*	.24146	.015
	BS TM	1.28205*	.24146	.000
	BS ENTREP	.84615*	.24146	.001

*. The mean difference is significant at the 0.05 level.

Based on Table 7 above, the results showed that there was a significant difference between BSEd and BEEd programs, BSEd and BTVTEd/BTLEd Programs, BSEd and BS IS programs, BSEd and BS HM programs, BSEd and BS TM programs, BSEd and ENTREP programs, BEEd and BTVTEd/BTLEd programs, BTVTEd/BTLEd and BS IT Programs, BTVTEd/BTLEd and BS TM Programs, BTVTEd/BTLEd and BIT Programs, BS IT and BS IS programs, BS IT and BS HM programs, BS IT and BS TM programs, BS IT and BS ENTREP Programs, BS IT and BIT programs, BS IS and BS TM Programs, BS IS and BIT programs, BS HM and BS TM Programs, BS HM and BS ENTREP, BS TM and BIT programs, and BS ENTREP and BIT Programs in the level of students' academic performance. On the other hand, Table 8 presented the significant relationship between teacher preparation and students' academic performance when taken as a whole using Spearman Rho Signed Rank Test.

Table 8. Relationship between Teacher Preparation and Students'Academic Performance Correlations

Correlations

			Students_Academic_Performance	Teacher_Preparation
Spearman's rho	Students_Academic_Performance	Correlation Coefficient	1.000	-.063
		Sig. (2-tailed)	.	.755
		N	351	27
	Teacher_Preparation	Correlation Coefficient	-.063	1.000
		Sig. (2-tailed)	.755	.
		N	27	27

The findings in Table 8 showed no significant relationship between teacher preparation and students' academic performance when taken as a whole.

Students Preparation in Flexible Learning

Mobile Load Preparation. Mobile load or wifi is essential to participate in online learning or be updated in every university announcement. Instead of going to school, students use their mobile data to check announcements, quizzes, activities, and assignments on Facebook Social Learning Group or messenger. This was exemplified in the excerpt of a transcript below.

> "Yes sir, bale ang akon nga gina obra sir is kung may mga google meet ako or may mga klase a head pa lang kara sir naga prepare ron ako kang load, etc. [Yes sir, what I did in my google meet if we had a class, I prepared a mobile load.]." (Meriam, 628-635)

Embracing the New Normal. Pandemic life is a New Normal. New normal in education means more effort from students and more patience and effort from teachers. We all know that students must eventually listen carefully to their teachers in this new way of the teaching-learning process; teachers who responsive and empathetic will listen to the needs of their students. Students are also struggling; however, they are willing to embrace this new normal in education, especially the challenges they encounter. This is exemplified in the excerpt of a transcript below.

> "We need to embrace it first nga ang online learning tulad nga year dapat tanan nga mga challenges kayanon ko. Nga sometimes may mga problem bala kara, for example, sir, di gawa ka intindi online, kay gina send lang tana, so dapat kung gusto mo gid nga ma man-an ngayo ka gid tana, ma reach out ka gid sa teachers mo nga, "Maam ano gani ang sa amu ka diya maam? Indi gawa ako ka intindi" or kung may mga clarifications ikaw, e clarify mo gid para bisan nga self-pace, I mean self-paced bisan nga ikaw lang mismo naga learn, at least bala sir ma clarify basi sala imu pag-intindi, then, amu ra ma come up kang sala nga idea, so you need to reach out man sa mga teachers mo. [We need to embrace online learning this time of the year and need to conquer all the challenges that we will encounter. Sometimes, we meet problems. For example, we can't understand the lessons online because it was just sent to us. If you want to know, you need to reach out to your teachers by asking for clarifications. We will also do self-paced to learn independently.]" (Majeh, 123-166)

Students Perception of Teacher Preparation during the Implementation of Flexible Learning

Asking Students of their Mode of Learning. Before the implementation of flexible learning, teachers were instructed by the university to survey students with regards to their mode of learning, which is either a synchronous or asynchronous mode of learning. Most of the students chose the synchronous learning mode, while few chose the asynchronous learning mode. Students chose their learning mode based on the availability of resources or tools like cellphone, laptops, wifi, tablet, etc.… This is exemplified in the excerpt of the transcript below.

> "Aw, bale amu ra sir ay nag… una pa lang is may survey sanda nga gin tau sir, nan, kay mapili kami kung ano. Tapos may diyan kami gin pili gid daw as in halos tanan kami ginpili sa isa ka subject kay daw medyo complicated tana sir nga module. [This is what happened sir, there was a survey, and we were ask to choose whether we will have the synchronous or asynchronous mode of learning. I felt that having modules are quite complicated.]" (Meriam, 305-317)

> Sa akun sir, gin pili ko synchronous kay para makapamati ka gid ti mayad sa explanation ni teacher kag kis-a di ako ka intindi maka clarify ko kay maam or kay sir sang lessons discussed. May cellphone man ko nga pwede ma usar mag online class. [For me, sir, I chose the synchronous mode of learning because I can listen to explanations of our teacher, especially when I can't understand our lessons being discussed or written in the module.]" (Smith, 125-131)

Level of Teacher Preparation. Students could observe how prepared their teachers are by looking at the module, especially in instructions. Clear instructions in the module could help students to understand the topic being discussed. Based on the observations of students, students could say that the level of teacher preparation is average. However, students also mentioned flaws in their teacher's preparation, just like the teacher's strategies and module content. The teacher's way of delivering their lessons reflects their teacher's preparation and the written content of their module, which might be inconsistent, especially with the instructions. Table 9 showed the perceived level of teacher preparation by students.

Category	Mean	SD	Description
Students	7.82	1.19	Prepared

Even teachers were still adjusting to the new setup of teaching and learning, and students still rated their teachers to be prepared. Based on the students' rating, the level of teachers' preparation during the implementation of flexible learning is Prepared with a mean of 7.82. This is supported in the excerpt of the transcript below.

> "Uhm, how prepared? Ang ano sir… daw average lang ang anda nga preparation para kanakon because may mga times nga, for example daw kulang kami sir sa… daw kulang bala kara sir sa instructions. Bale on the spot ana instructions sir. Tapos, inconsistent ang ana nga insructions man sir. Kag sa mga materials okay man sir amu to kaina ang sa content okay man ang module nanda. Sa teaching strategy lang amu ra sa instructions bala sir haw, inconsistent gawa. [Uhm, how prepared? What sir? Seems average about teacher preparation for me because sometimes, for example, there is something lacking sir. lacking in the instructions. Instructions were given on the spot. Then, inconsistency in the instructions. In the materials, the content were not clear. In the teaching strategy, there is inconsistency in the instructions.]" (Meriam, 442-451)

Module Preparation. Students find the module topics were appropriately arranged. However, there are parts in the module's content that the student cannot understand and still needs explanation. The students usually asked their teachers or searched some notes or articles on the internet to further understand the topic being discussed in the module. For the students, it is better if the teacher could discuss it virtually rather than relying on it solely on the module. Students find the module preparation as prepared. This is exemplified in the excerpt below.

> "Ako sir ang sa module sir ang sa plastada na okay lang man sir. Mainitindihan ko man pero may diyan sir kaisa ang sa content na ti siyempre lain gid bay sir kung gina discuss kang, gina mangkot mo para maintindihan mo sir. [For me, sir, the module was appropriately prepared. I can understand; however, there are times that the content discussed cannot be understood. So, I ask my teacher.]." (Cute, 473-477)

Teaching Strategies. Teachers utilized the Facebook Social Learning Group during the implementation of flexible learning. Facebook was more convenient to use since most of the students have Facebook accounts. Teachers used video calls in Messenger for their online classes. Some teachers used Google Meet or Zoom. Quizzes or exams are also given thru the Facebook Social Learning Group. Students also observed that teachers were also struggling with how to deliver their activities or lessons; however, students also appreciated their teachers' efforts to deliver their lessons well online or modular. This is exemplified in the excerpt of a transcript.

> "I think sa may teaching strategy and teaching preparation, it was well. Wala po akong nakikitang bad side. Kasi ang napansin ko lang, medyo nahirapan yung university especially the teachers and instructors, is yung modular or yung hand-outs. Kasi sa may Information Technology, sa may council namin, for our section, medyo hindi na implement yung modular even though there are, some of my classmates who opted for a modular, pero kailangan pa ring mag digital kasi there are activities na hindi mo talaga magagawa ng modular, like laboratories. [I think that teaching strategy and teaching preparation, it was well. I do not see any bad side. Because I noticed that the university has difficulties, especially the teachers and instructors with the modular or handouts. In the Information Technology Council, for our section, modular was not quite implemented. Some of our classmates opt to have it modular; however, we still need to digital because there are activities that cannot be performed in the hard copy modules like laboratories.]" (Willy, 247-258)

Being Considerate to Students. Considering students in every output they are submitting is always done in this time of pandemic due to problems encountered by students especially having unstable internet connectivity. However, some take this consideration for granted by delaying the submission of their projects. Most students appealed to give more consideration in this time of the pandemic. This is exemplified in the excerpt of the transcript below.

> "With the preparation, I think it's being considerate. Sa situation ng iban, kasi hindi naman lahat ng mga estudyante is pare-pareho ng situation, so kailangan tigdan din natin kung ano yung situation ng iba or kailangan i-consider din natin na yung iba ay talagang nahihirapan, ganun po. [With the preparation, I think it's being considerate. In the situation of others, because not all students were having the same situation or others need to be considered because they were struggling.]." (Willy, 268-273)

Students Learning Experiences during the Implementation of Flexible Learning

Students' Realizations Shaped their Learning. As students overcome every challenge that they have encountered during the implementation of flexible learning, they were able to learn based on their experiences and observations that patience, self-motivation, and prayer are essential aspects to be considered for a student to be faced the challenges that will be encountered in the synchronous or asynchronous mode of learning. These aspects were also their learnings as they reflected and realized. Testaments with regards to these realizations are evident in the excerpt of transcripts below.

> "Ay diyos ko, raku-raku gid sir. First, is patience; second is uhm motivation; third is ano pa ang na learn ko? Ang na learn ko sir is uhm prayers. First, sir is patience, ang… as a teacher required gid ra tana nga maging patient ikaw, di bala sir? [Oh God, so many sir. First is patience. Second is Motivation. Third that I've learned is... I learn also is to pray. First is patience since teacher give you requirements and due dates, you need to be patient.]." (Meriam, 424-434)

> "To be a better person in terms of patience… It's because ang loading buhay-buhay so kinahanglan mo gid nga pasensyahan sir para gid dlang nga maka download ikaw. Patience man sir the way ikaw mag… patience man mag communicate sa teacher sa other classmate kag kung mag answer sa module. Patience man sir sa ginatawag nga sacrifice. It is because kung wara ikaw ti patience para sa self mo nga you cannot do it, hindi mo gid ra ma obra. So, diyan ko gid na realize nga kinahanglan maging pasensyuso gid ako sir because indi madali ang sitwasyon. Motivation man tana sir nga dapat, uhm, sa amo ka diya nga set up mas better pa kaysa before. Kay kung wara ikaw ti motivation sa amu ka diya aspeto sir. Bale ma hayaan mo tana sir nga mag wait ang bagay-bagay. Hayaan mo na lang mag-abot ang deadline kag diyan mag obra. So, kung wara ikaw ti motivation example bi kung wara ikaw ti motivation nga mag bugtaw para obrahon ang urubrahon niyo. So, wara ka gid may natapos, so dapat kinahanglan may motivation sir raku ang obrahon kara, but ang motivation man sir para ma improve ang self ko. Next, is ang prayer so since amu gid diya sir ang natun an ko nga bigger aspects sir kay daw It is because I know nga nag rayu ako. Nagrayu ako sa babaw because of busy, etc. etc. raku-raku nga rasones. [To be a better person in terms of patience… The internet connectivity is very slow, and you need to be patient, especially when downloading files. You need to be patient, sir. Having patience also when communicating with the teacher and also in answering the module. Patience also, sir, in what we called sacrifice. It is because if you have no patience in yourself, you cannot do it. So, I realize that it is needed to be patient because our situation is not easy. Motivation also, sir. If you have no motivation, the tendency is you will not do your activities. You will just stay stagnant. You will let it reach the due date, and then you did not do anything about it. Therefore, you need to have the motivation to work things out. Next is prayer; this is the bigger aspect of my learning. Because of being busy working the activities, you have no time for God. Setting time for God is very important to guide you and blessed you in every task that you are doing.]" (Meriam 500-579)

Teacher Preparation helped Build Students Learning. Teacher preparation plays a vital role in students learning. Teachers who are prepared enable students to delve their understanding about the topic by motivating them to explore more on the internet by themselves and through the teacher's effort to be composed of every activity that is to be done virtually. Students also learned a lot from their teachers virtually. Students appreciate more when their teachers are well prepared because they know a lot from them. They expressed it in the following excerpt of transcripts.

> "Ang… sa akon sir ti siyempre online ron bay ti teachers are only ga facilitate lang bala kang learning sir, ti ikaw mismo nga student siyempre you need to be more explorative bala sir. Huod tapos kung ano ang maano mo sa amu kara nga subject hindi mo maintindihan kung ikaw nga ga self-learning ti kung gina explain ni teacher kapin pa kung prepared siya siyempre maintindihan mo man sir. [For me, sir, we are now doing online classes; the teachers are just facilitators of learning. You, as a student, need to be more explorative, sir. Yes sir, after that what will you do if you don't understand the lessons on the subject? You must do self-learning, and if the teacher is explaining the lessons well, it means that the teachers are well prepared because you understood the lessons, sir.]" (Cute, 527-533)

> "Sige sir, may diyan… since in general tana sir bale ang isa ko kato nga teacher daw darahon na lang tana. So, may positive man tana sir nga aspeto it is because nga sa content kang anda nga preparation daw diyan gid kara ang medyo nami gawa, ah, daw medyo naka learn gid kami. Kag sa strategies nanda sir… amu man to kaina sir ang inconsistent nga instructions, pero kung sa kabilugan sir nga naka learn gamay, amu ra sir. [Yes, sir, since it is general. One of the teachers is one of the... So, he has a positive aspect because of the content and preparation, and it's quite good. Then, his strategies also, sir. However, there are inconsistencies in the instructions. Overall, we learned a lot, sir.]" (Meriam, 475-483)

Perceived Experiences of Students in Assessment

Assessment Strategies by Teachers. Teachers are doing their best to execute their assessment strategies effectively since the university suggested using the Facebook social learning group, google form, nearpod, and Kahoot as platforms to conduct quizzes, activities, and exams. Some of this platform has a time limit that could make the quizzes or exams reliable. These are evident in the excerpt of transcripts below.

> "Bale sa isa namon… ang sa major namon sir ang bale google meet sir, na e flash lang ra ni maam ang question then amu ra e answer namon tapos ang answer kung mag checking ron ra sir amu ra sir ang ano man giyapon kami virtual. Tapos mag check sir e send lang ra ang kung ano score mo tapos sa iban sir naka file ron nga daan. Ang iban namon nga subject naka file ron naan sir. Tapos answeran mo diyan ra, may limit kara sir tapos kung tapos mo ron answeran amu ra e send mo lang kay subject teacher. [In one of our subjects, sir, we use google meet in answering quizzes. Our teacher asks a question by flashing it on the screen, and then when checking, it is done virtually. While other subjects, it is in google form then there is a time limit.]." (Cute, 304-314)

> "Yes. There are quizzes through Nearpod and Quizzes na application. And then, there are also some activities done through Google Form. And then major exams like midterms and finals sometimes are done through Quizzes and Nearpod, and Google Form." (Willy, 277-282)

Disadvantages of Online Assessment. Students were able to determine some disadvantages of online assessment based on their experiences. Some of these observations are unstable internet connectivity, and objective tests are easy to answer and perfect. These disadvantages could also lead to unreliable results of the assessment. Students preferred to have an authentic type of assessment rather than the traditional type of assessment because they find it more challenging and prone to cheating. These are evident in the excerpt of transcripts below.

> "Uhm may isa ako, ang sa ano bala sir, like sa quizzes nga hambal mo sir like sa assessment. Ang disadvantage lang sir kang quizzes namon sa google meet it is because ga dura-dura bay gani ang signal sir. So, kung maghambal si teacher kang number one or number two, gadura-dura kami. Wara ron kami ti answer, so bali honestly daw sa tuod-tuod naga cheat kami kung may mga exam bala sir haw. [Uhm, I have one sir, like quizzes, an assessment. The disadvantage of quizzes in

google meet sir is because the signal is not stable. So, if the teacher is asking questions, the signal is not good, we cannot answer the questions that lead us to do cheating in an examination.].” (Meriam, 366-374)

“Uhm, daw amu kara sir, daw performance-based tana, tapos sir sometimes bay sir kung maghambal kita… tulad bay sir online mahambal kita gani nga objective type multiple choice, daw ano bala kara true or false. Siyempre sir ma seen, makita bala kara sir sa module kung ensakto ang sabat or hindi. Teh siyempre kung ikaw gid man nagabasa, siyempre tanan man siguro kami nga estudyante nagabasa tulad, daw dasig bala kara sir ma perfect aw, pero kung performance-based bay sir daw mahambal man tana sir nga makita, ‘ay huod amu ka diya nga bata daw may potential’, huod sir, daw amu kara sir.” [Uhm, That is, sir. Like performance base, then sir, sometimes we can say that... Now, online, we say that it is objective type; we have multiple-choice, true or false. Sir, we can see it. We see the answers in the module by checking if our solution is correct or wrong. Sir, if you are reading the module, you can easily remember the module's answer and check again if it is accurate. The tendency is we can perfect the examination unlike performance-based sir, and the teacher could genuinely say that this student has potential.].” (Majeh, 501-513)

Students' Perspective of Fair Assessment. Fair assessment can make a difference to students in getting the grade they deserve and a grade that does not reflect their performance, knowledge, and skills. In this pandemic, objective type of examinations is not fair to students’ point of view because there are many ways to cheat. They preferred to have a subjective type of test. This is exemplified in the following excerpt of transcripts.

“Uhm, para kanakon sir to have a fair assessment sa mga students dapat sir hindi lang bala mag-tao ang teacher kang objective nga exam, mas better guru kung ano bala sir… ano ra man objective or subjective, nalipat man ako. [Uhm, for me, sir, to have a fair assessment to students, the teacher should not give an objective type of examination. It is better to have a subjective type of assessment.]” (Majeh, 472-476)

“Daw amu tana kara sir performance-based tana para mas ma assess gid ang students. Kay kung maghambal bay kita sir nga kung objective type of test kara sir daw ano… objective type gid man ra sir ang ga base lang ikaw sa kung ano ang ano? [That’s it, sir, performance-based assessment, sir. If it is objective type sir, it is only based on What is?].” (Majeh, 480-484)

Challenges Encountered by Students during the Implementation of Flexible Learning

Internet Connectivity Issues. Nothing is more challenging than dealing with internet problems when students connect for their online classes. Waiting an hour for a video or file to download, staring at a blank screen while loading, or having an online course with the teacher discussing and suddenly stops. This is frustrating for students. This can affect students learning at the same time, student academic performance. Students find ways to solve this problem, like going to places wherein internet connectivity is stable. Others invested in buying prepaid wifi or installing a fiber internet connection to make them comfortable attending and participating in an online class. This is exemplified in the excerpt of the transcript below.

“Well yung pinaka-challenge po is regarding connectivity, regarding signal. Sa akin kasi, I’m just lucky enough na makapagboard dito sa banwa, so nakabili ako nung prepaid wifi, globe at-home wifi, so mas naging stable yung internet para sa akin. Pero yun yung una na nagging challenge nung hindi pa ako nag-boboard, na nasa bahay pa ako. Like kailangan mo pang pumunta nang isang bundok. Hindi naman yung pupunta ka sa specific na bundok kasi merong spot na maganda yung signal pero lalakarin mo pa, parang ganun po. [Well, the most challenging is regarding connectivity, regarding the signal. For me, I’m just lucky enough that I am staying here in the town. SO, I bought prepaid wifi then my internet connectivity was stable/ However, it was very challenging when I was not staying in the town. I was staying at our place in the mountains. Like you need to go in one part of the mountain to get a good signal, but you need to walk towards that spot in the mountain.].” (Willy, 434-448)

> "Ang challenges nga una sir is unstable internet connection, then ang load sir and means, mode of answer, submission and communicating with the teachers. [The first challenge, sir, is unstable internet connectivity. Then, mobile load sir, means, mode of an answer, submission and communicating with the teachers.]." (Meriam, 615-620)

Unavailability of Tools and Insufficient Discussion of Modules Online. One of the challenges that students encountered before implementing flexible learning is the unavailability of tools used in online learning or synchronous mode of learning. These tools are cellphone, laptop, tablet, desktop, prepaid wifi, or installed wifi router. On the other hand, students observed that modules uploaded online and were used by teachers to teach online were not discussed sufficiently. This is exemplified in the following excerpt of a transcript.

> Yes, as a matter of fact, kasi if you say programming languages. Anu siya e, mainly gina compose, gina himu siya sa computer or desktop. So, especially ako, wala naman akong laptop, wala naman akong computer that time. So, nahirapan ako. [Yes, if you say programming languages. It is primarily composition, and it is done on a computer or desktop. Especially for me, I have no laptop or desktop at that time. It was a difficult situation.]" (Willy, 100-105)

> "Ang mga modules wala gawa na discuss mayad sir haw. [Modules were not discussed sufficiently.]" (Jen, 208)

Adaptability of a New Way of Learning. Students were also struggling to adapt to the new ways of teaching and learning process. They were used to go to school and have a face-to-face class. However, in this time of the pandemic, everything has changed. Students need to stay at home and attend virtual classes or work on their modules uploaded by their teachers in the Facebook social learning group. This is exemplified in the excerpt of the transcript below.

> "Akon gid sir una-una gid sir is ang adaptability. Ga struggle gid ako sa pa adapt sir e, kang once nga nag start ang online ka diya sir. Kay siyempre lain… naandan ron bay ang face to face then amu ra gani sa amon sang face to face ga board kami para… siyempre sa transportation bala sir makatipid kag siyempre wala gid bay to signal sir. Kag ang connectivity gid tana sir e, amu kara ti daw siyempre e adapt mo pa kung ano tulad ang online sir nga… [For me, sir, first is adaptability. We are struggling, especially me, sir, when flexible learning was implemented. We used to in riding a jeepney and go to school and attend classes face to face. Now, we can save money from transportation; however, internet connectivity is unstable at home.]" (Cute, 635-644)

Stressful Situations for Students. Students encountered some stressful situations during the implementation of flexible learning, like when all modules were given simultaneously and due dates were set. This pressure students to work it out early and submit the outputs before the due dates. Sometimes, students were confused about what subject they would work out first and their health, especially their mental health. This is exemplified in the excerpt of transcripts below.

> "Huod sir, kapin pa kung magtarambak ron bala ra sir, magtiripon ang mga modules. [Yes sir, especially when modules were given simultaneously.]" (Cute, 679-680)

> "Medyo lang sir kay raku bi subjects nga na encounter pa gid namon, so ga ramble ron sa isip namon kung ano unahon namon ubrahonon, tun-an. Ga stress man sir e, ga riniwang na gani mung. [Not quite, sir, because we have a lot of subjects to comply with. Sometimes our mind is confused on which is the first module that we will work on. We were stressed, and I am getting slim.]." (Jen, 125-128)

Lack of Family Support. In this time of the pandemic, family support plays a vital role in students learning at home. Constant support is needed to boost student's momentum in doing their activities or tasks at home. With the guidance of the parents, students will not experience mental health problems. Especially in providing student needs for online classes just like a cellphone, mobile load or wifi, and other means to connect to the internet. This is exemplified in the excerpt of the transcript below.

> "May isa gid ako nga classmate sir or iba nga mga students pero mga second year and first year sir, naagyan gid nanda sir kung kulang ang support sir siyempre like sa cellphone or sa gadgets kay iban bi sir ga hiram- hiram lang, amu bala ra sir aw. Ti kung I mean bala kung wala ti support ang parents like magbuliganay sanda or makatalk sanda kang student, so bahol gid ra nga factor sir nga maapektuhan gid ang mga bata especially sa flexible learning kay man kay sir kung hindi pag buligan ka parents ti siyempre lain lain ron ang maisip ka bata, amu bala ra sir haw. Kag hindi na gid ma perform ang anda nga responsibilities as a student which is to gain learning. Ang iban nga lower years daw amo gid ra ang problema nanda sir nga daw kulang sa support. [I have one classmate sir and other students sir from the second year and first year that they experience lack of support sir from their parents like cellphone or gadgets. The tendency is they borrow gadgets from friends. If there is a lack of support from parents, it's hard for the students to communicate or participate in an online class, and their performance in flexible learning will be affected. Other students in the lower years have that problem which is lack of family support.]." (Meriam, 259-279)

Home Distractions in Learning. Home distractions are one of the problems students encounter, especially when they are having their online classes or answering their modules. When their parents are trying to ask them for an errand, their parents unconsciously did not know that their child is having an online class or answering activities in a module. Aside from that, there are times that students are complaining about the noise of vehicles that is passing by near their house also contribute to distractions their learning. This is exemplified in the excerpt of transcript below.

> "For example sir ga klase kita, tapos sometimes sir may gahud may mga noise nga naga… tapos kaisa kara ang internet connection grabe gid tana sir, lag ka gid tana kag hindi nami ang signal especially sir globe bi ako. Medyo budlay gid ang signal, uhm siyempre di ka gid katuon bala kara mayad kag sometimes may mga time nga kailangan mo man may kadtunan. For example one time nagklase kita katu sir nagpabanwa ako kay may kailanganin ako nga bul on, allowance ko. Ga dasig gani ang tricycle ah… tapos daw budlay bala kara sir kay daw ga klase kami pero daw ga live kami nga daw normal man sa gihapon nga students sa balay, daw feeling mo bala kara vacation pero ga klase gali. [For example sir, when we are having our class, then sometimes there are noise outside. Sometimes, internet connectivity is unstable. It isn't easy, sir. Sometimes, you need to find a place where internet connectivity is stable. For example, sir, when there was an online class, I went to the main town to attend an online class and have stable internet connectivity. We felt that we are living normally like schooling at home. It feels like a vacation, but there are online classes.]." (Meriam, 44-57)

Students Ways to Cope up Challenges Encountered in Flexible Learning

Ways to Connect Online. In this pandemic, students find ways to be updated and connect online by borrowing mobile phones from their older brother or sister or even with their parents. Sometimes, they hang their mobile phones in the part of their house where internet connectivity is good. Other students can earn money to buy their mobile phones to participate in online classes or be updated with the latest modules that their teacher uploaded in the Facebook social learning group. Indeed, students are resourceful. This is exemplified in the excerpt of the transcript below.

> "Uso to sa amun, sab-it sab-it lang. Siyempre ga huram ako sa magurang ko bala sir tapos amu ra ga pa signal lang gid kami kag okay lang man kung okay ang signal sir ma ano lang man dayun ang imu gina pang send. [Hanging the mobile phones inside the house is rampant. Sir, I borrowed the mobile phone of my sister and then I went to the place where a signal is good.]." (Cute, 159-164)

> "Nag ngita ka paagi para maka cellphone ti mayad kag para maka access kang akon nga assignment kay akon bay cellphone kan-o sir di maka access mayad sa internet. Amu ra nag ngita ako paagi, ngita ka barakal, amu to sir. Ang ano bay ako sir working student ti kung ridto ako kay

lola ko idto ako ga obra… Huod sir kay may Wifi tana to sanda. [I find ways to buy a cellphone for me to access my assignment and participate in online classes because my old cellphone was broken. That's why I find ways to buy. I am also a working student, sir. Sometimes, I went to my grandmother's house, and I worked there. There is a wifi signal in my grandmother's house for me to access.]." (Jen, 14-21)

Compilation of Activities. One way students cope with their activities is to compile them and make some schedule of when to answer. The compilation is referred to as a portfolio by students. Even exams were compiled like a portfolio for those who wanted to have a hard copy of the examination. This is exemplified in the following excerpt of a transcript.

"Ang bale sir akon sir nang ano… gina pang compile ko lang danay tanan sir. Sir ang siyempre sir sa mga activities nga gina pang submit namon sir, then amu ra bale ang iban kara gina compile ron ra sir bale portfolio type ron bala sir na tapos ang iban gahatag… gahatag man sanda midterm kag final. [For me, sir, I compiled everything, sir. Sir, all activities that we have submitted was compiled like a portfolio type even midterm and final examination was collected.]." (Cute, 182-187)

Time Management. Time management is one way students cope with their activities or tasks given to them through their modules. Scheduling is their strategy for them to balance their work at home and online classes. Making a checklist is also done for them to monitor the activities or tasks they have already done. This is exemplified in the excerpt of transcripts below.

"Tapos amu ra gina schedule ko lang kung paano ko sanda ma manage bala sir kag ma answeran before kang deadline. Pero kis-a sir hindi ko man ma ano… sa deadline kara makapasa ko sir. Ti siyempre kung diya ikaw sa balay kailangan manage mo gid ang time mo kay siyempre may urobrahon man diya kag siyempre mapa signal pa man bay sir, ti amu ra sir. [I scheduled my activities on what to do, and that is my management style. Sometimes, I cannot follow my schedule to the pressure of having a deadline for submission. Because when you are at home, you manage your time and you try to find a good area where internet connectivity is stable.]" (Cute, 188-195)

Ways to Cope up with Assessments. Students have some struggles with assessment, especially online assessment, when teachers use a time limit. However, students are resourceful and wise. A student could find ways to get the correct answer in quizzes and examinations. This is exemplified in the excerpt of transcripts below.

"Ano sir kung ma download mo ron ra ang file kara sir ti siyempre kung kaisa naka ano ka man internet bay sir ti amu ra dara dayun ano research. Ang ano sir… e search mo ang mga meaning kung ano ang meaning bala kang ano sir sa may description kang…[If you download the file for the quizzes or exams from the internet. Eventually, we search the meaning on the internet based on the description for us to answer the questions correctly.]." (Cute, 346-353)

Ways to Cope up with Tasks and Stress. With all the problems encountered by students, they could find ways to cope with the tasks and stress encountered. Stress frequently happens in this pandemic due to many activities and outputs that students need to be accomplished by students in their modules. Based on the following excerpt of transcripts, they could cope with the stress by doing such activity at home.

"Ga Garden man sir. Huod sir, para mawili ko man ang kaugalingon ko, hindi kuon nga ano ka gid diyan sa activities mo. [I do garden sir. Yes sir so that I have something to do.]" (Cute, 662-669)

"We find an alternative application on playstore na pwede mong Gawain sa cellphone. Then, pwede ka ring magcode sa cellphone, pwede mo siya ring magsave sa cellphone as well as pwede mo siyang e run sa cellphone. [We find an alternative application on play store that can be downloaded in our cellphone, then we can do our coding in programming activities.]." (Willy, 112-116)

Self-Motivation and Peer Support. The capacity to motivate oneself to take the initiative and action to pursue objectives and finish tasks is referred to as self-motivation. It is an innate desire to act – to create and accomplish. It is what motivates you to keep continuing activities, particularly ones you're pursuing because you want to, rather than because someone instructed you to. Peer support is when students use their prior knowledge and experiences to help fellow peers do activities or tasks in school. This is exemplified in the excerpt of transcripts below.

> "Hmmm. May mga time nga kung di ko ron kaya, daw budlay ron gid tana, raku-raku tana, ga lingin ulo mo kung diin ka maumpisa. Pero nagabalik ako sir sa akon nga mindset nga third year ron ako, graduating ron ako. Kung gusto mo mag maestra need mo gid diya tapuson, daw amu bala kara sir. Daw ka cliché ron pamatian nga magbalik ka sa imo nga objective, sa aim mo. Pero para kanakon sir the best gid tana nga motivation nga hambal mo nga gusto ko ma teacher, so need ko gid diya ma experience ang amu ka diya nga type of learning. Malay mo sa sunod nga generation ma online man ako, at least man an ko ang feeling as a student kag syempre ma practice ko man tana to be a perspective teacher daw amu kara sir. [Hmm. There are times that I cannot do it anymore. It is very difficult, so many, and my head is dizzy if where to start. However, I go back to the mindset that I am already a third-year student. If I want to become a teacher, I must finish these activities. It is like cliché that you heard the objective so many times. However, it is best to motivate me, and you're advice to us, sir, was also the best that we need to experience this. Maybe in our generation, we will use online platform in teaching.]" (Majeh, 224-238)

> "For me gid sir is self-discipline, kag self-directed ikaw tapos may self-motivation man sir kay idya siyempre online ikaw mismo bi nga estudyante sir ang kaugalingon mo nga for example sir kung self-directed ikaw may gina set ikaw nga goals ma stick ikaw diyan kara, nang kung for example sir nabudlayan ka sa amo kara nga subject ikaw gid mismo ma ano ma motivate mo… imu self sir. Self-discipline… time management pa gid gali sir. [For me, sir is self-discipline and self-directed, then, self-motivation sir because it is online. You, as a student, yourself, for example, must be self-directed. Hitting your goals. If you have a hard time doing it, you need to motivate yourself.]." (Cute, 580-589)

Students Suggestions in Teacher Preparation

Reaching out to Students. Students observed that some of the teachers do not reach out to their students regarding answering the modules and giving them alternatives if they cannot comply with the requirements. One of the significant suggestions of students is that teachers should reach out to all students they are handling in their course subject. Students also observed that one subject teacher did not meet them even once. This is exemplified in the excerpt of the transcript below.

> "Sa mga teachers namon sir is… ano sir nang sanda lang sir mag reach out bala sa mga students nanda sir. Kailangan daw anuhon bala sir siyempre para para maman-an man nanda kung ano ang sitwasyon kang students nanda. Ti siyempre amu to gani sir ang hambal ko kaina kanimo sir nga nag subject lang kami ka amu kara pero never-never gid kami nag meet-up kang subject teacher, nan amu ra sir. [For our teachers, they should reach out to their students. They need to know the situation of their students so that they could help address their concerns. There is one subject of our sir that the teacher did not meet us even once.]" (Cute, 722-729)

Being Considerate. In this time of the pandemic, students encountered a lot of difficulties in flexible learning. Students are asking for a bit of consideration from teachers if they will experience a delay in submitting their answers. This is exemplified in the excerpt of transcripts below.

> "Tapos kung sa ano man sir, kung sa mga online learning nga ano sir okay lang man ang pag ano kay siyempre no choice man kita sir, maano na lang gid ikaw sa mga teachers mo sir. For example ang consideration, cooperation sa mga students nanda sir especially sa mga struggling sa mga online learning. [Then, sir, if online learning, it is ok; however, you have no choice. You have to obey what you're teachers going to say. For example, being considerate to students especially those who are struggling in online learning.]." (Cute, 730-736)

Giving Specific Criteria or Rubric to Outputs. Teachers should provide specific criteria in evaluating student's outputs for a fair assessment. Instructions should be evident in every activity that the students are doing to make the correct output. This is exemplified in the excerpt of the transcript below.

> "When assignment and projects or the outputs it is recommended guru sir nga matao tana mechanics, criteria or rubrics with regards sa mga outputs katu, so that we will be guided. Next, sir is consistent instruction by the professors. Example sir is ang ana nga instructions lain pwede man ra guru… pwede man ra guru ma apply like, uhm, e plastaron na ron daan sir nga sa word or pdf nga amo ra diyan tanan nga instructions. Example bi amu ka diya amu ka diya sir. Next sir is mas nami sir nga kung may mga projects or sa modules nga mga performance tasks kag mga activity. [When assignment and projects or the outputs, it is recommended guru sir if the teachers will give mechanics, criteria or rubrics regarding the outputs so that we will be guided. Next, sir is consistent instruction by the Professors. I think it is better, sir, if it is well organized in a Microsoft word with regards to clear instructions in every activity or performance task.]." (Meriam, 699-711)

A deadline should be put in every Activity and Strengthen the Continuity Education Plan. Some students preferred to have deadlines in every activity to work it out and gave them goals to achieve. Strengthening the university's continuity plan is one of the students' suggestions for them to be oriented of the platform to be used online learning. This is exemplified in the excerpt of the transcript below.

> "Mas prefer ko gid tana nga butangan ka deadline sir and then the last sir is mas e strengthen ang continuity education plan kang aton nga system like bi amu to sir mas better man to sir mga seminars, forums to encourage us pero mas nami siguro sir nga e ano nanda sir…[We prefer sir that deadlines should be put in every activity and lastly sir, we need to strengthen our continuing education plan of our university like conducting seminars, forums, etc.]" (Meriam, 712-719)

Creating Webinars about Online Platforms to be used. Students suggested that there should be webinars intended for students conducted by the university before the start of the semester regarding online platforms to be used. This is exemplified in the excerpt of the transcript below.

> "Magcreate kang webinar that tackles different platforms sir. Ang educational platforms wherein we could, aside from google or anything nga pwede namon magamit sir sa amon nga new normal ang performance tasks and etc. amu lang ra sir. [Creating webinar that tackles different platforms, sir. The educational platforms wherein we could use in the new normal in every performance task, etc.]" (Meriam, 720-729)

Teachers' Preparation Experiences in Flexible Learning

Webinars, Trainings, and Workshops Attended. When the Covid-19 Pandemic started, the University began to plan for webinars, trainings, and workshops that faculty needs to be equipped with the technological knowledge and skills for the flexible learning approach. It is imperative to conduct such activities for faculty to be familiar with online teaching because it is the new way of delivering lessons in this Pandemic aside from having modules. This is evident in the experiences of faculty in the excerpt of transcripts below.

> "Before this flexible learning was implemented, we are so glad man that there are series of workshops conducted by the university on module making. I was able to attend three sessions on a workshop on module making. Because I was handling two subjects last semester, there was also an orientation on FB Social Learning at ISAT U Miagao. We are asked social learning account for this, and then group chats for also me for class. This is to make sure that everyone is informed and no one is left behind. I am referring to the students, so in particular, those are my preparations for this flexible learning." (Teacher Nicole, 4-14)

> "Of course yes. So number one ginsend kita sa seminar and training so that we will know how to prepare our materials and instructional materials rather to conduct our lesson to our students. Like for instance, they are going to provide subsidy. Ang aton nga internet, that is number one help gid

> kang school. To conduct our flexible learning. So number one gid nakahelp ang school because of the subsidy. Then they trained us how to conduct flexible learning. For example gin train kita sa computer, we will become literate, computer literacy. That is na help gin kang school. [Of course, yes, number one is the seminar and training that we will know how to prepare our materials and instructional materials rather than to conduct our lesson to our students. Like for instance, they are going to provide a subsidy. Our Internet is the number one support by the school for us to conduct flexible learning. Then, they trained us to conduct flexible learning. For example, we were trained in computer, and we will become literate, specifically computer literacy that is the support of the university.].” (Teacher Agatha, 12-21)

Decongesting the Curriculum in the Syllabus. Since the delivery of classes was done virtually or in a modular approach, topics in the syllabus during face-to-face learning are congested. The university instructed to decongest the curriculum by looking at the essential topics that need to be delivered virtually or modular. This is exemplified in the excerpt of the transcript below.

> “So first we calibrated our syllabus or our syllaby in the courses handled. Ginadjust according sa pandemic setting. Gin cut ang some topics nga indi siya muna ka viable to teach and ind man siya sado ka importante kung baga. In terms of achieving, the course outlines. Medyo gin slash. Mga gamay lang nga detail bala. [So first, we calibrated our syllabus or syllabi in the course subjects we handled. We adjust according to the pandemic setting. We remove some topics that are not viable to teach and choose the important topics needed. In terms of achieving the course outline, we removed some details.].” (Teacher Pen, 6-10)

Online Platforms used. Online platforms were one of the concerns of the faculty because it serves as a delivery platform for teaching and learning process. The university suggests using the Facebook Social Learning Group since most of the students have Facebook accounts. It will be an accessible medium of communication between the teacher and students. Teachers were able to adjust and learn from this platform. However, other teachers have difficulties. This is exemplified in the excerpt of the transcript below.

> “So for my teaching preparation experience last semester, during the implementation of flexible learning, it is not quite difficult for me because I’ve been using some online methods before like the Google Classroom. When flexible learning was implemented, I only made a little adjustment for another platform since we use Facebook, a social learning group. For the gathering mechanism of their output. The sharing was almost quite the same with Google Classroom sharing of learning materials. Because the subjects that I’ve been teaching are already with me for quite a period. So medyo gaupdate lang ko sa content nga iban [So, a little bit updated in the content] and I need to trim down some of the topics so that it will fit for the period of flexible learning.” (Teacher Pen, 5-16)

> “Tapos I designed a Facebook Social Learning Group that will cater the needs of the students. Avoiding the use of module kay gasto sa print. Tapos medyo tasking siya sa part sang bata kay you have to still meet them. To distribute and retrieve the module something like that kung printed. That is why nagdesign ako Facebook Social Learning Group. Sa kadacourse nga na handle ko. Then nagcreate ako sang learning unit sa kada course para organize siya. Kag ang training nga ginhatag sa aton about Facebook Social Learning Group ginshare man namon ni Sir Elmar with our colleagues. So that are some of the things that I’ve experience preparing my materials and teaching encounter in the first semester. [Then, I designed a Facebook Social Learning Group that will cater to the needs of the students—avoiding the use of modules because they wanted to print. Then, quite hard to the part of the students because you have to meet them. To distribute and retrieve the module, something like that kung printed. That is why I design the Facebook Social Learning Group. In every course that I handle. I created the learning unit in every course to organize it. And the training that we attended about Facebook Social Learning Group that we shared with Sir Elmar to our colleagues. So that some of the things that I’ve experience preparing my materials and teaching were encountered in the first semester.]” (Teacher Shine, 10-24)

Module Making. Asynchronous learning modes constitute modules for students who cannot access virtual classes or synchronous classes. However, teachers experience difficulties in doing the module. This is exemplified in the excerpt of the transcript below.

> "May module kami na ready hard copy. Gin amatamat ko lang ang content. Kabudlay kay ang amon nga ano, ginreduce ko lang ang topics kag ang activity nila. Pero sa major subjects sang Info Tech, gintrim down gid, lalo na may lab eh gintrim down mga iya nga content bala. [We have a module that is a hard copy. We gradually make the content of the module. It is hard, especially when we reduce the topic and activities. However, in the major subjects of the Info-Tech, we trim it down especially those with laboratory-based course subjects.]." (Teacher Pen, 34-38)

Teaching Preparation to Students Academic Performance

Teachers Affirmation of the Contribution of Teaching Preparation to Students Academic Performance. Teachers affirm that their preparation contributes to students' academic performance. Every teacher was able to prepare well in terms of their pedagogy. This is exemplified in the excerpt of the transcript below.

> "Yes eh. Nami man performance ka mga kabataan. Ga wonder man ako, Ay naka ubra man sila ka amo ka ja. Sa akon lang ha, daw indi gid ako contented kang lecture. Kay lain gid tana kung maindividual mo tana. Kay kang una mademo ka pa. After mo ka demonstration, may individual mo pa nga ma supervise. Gaindividual supervise ka daan sa mga kabataan. Pero that time, they know. Na perform man nanda. Ang akon lang nakacomplete sila nga attire, naka apron may grade ra, naka hair net, naka ano. Kay muna gid man sa rubrics. Since pandemic, ti I have to follow. Ang indi ko lang ma evaluta accurate is their sensory. Ang flavor, taste smell, indi ron tana. [Yes, the students have a good performance. I wonder that the students were able to do this and that. For me, I am not contented if you do the lectures only. It is different if you do it individually. Last time, they do the demonstration individually. I do individual supervision for each student. That time, they know. For me, they can complete their attire with an apron, and the hairnet will be given points. That is what can be found in our rubrics. Since pandemic, I must follow the rubric well. The only thing that I can't evaluate accurately is the sensory evaluation. The flavor, taste, smell,…]" (Teacher Agatha, 180-197)

Learning Materials Preparation. Because of the limited time the teachers met with the students, the rest will be self-paced learning. Learning materials play an essential role in self-paced learning. It is imperative to prepare for developing these learning materials as supplemental materials for students to learn at home. This is exemplified in the excerpt of the transcript below.

> "Yes sir. We need to prepare for the topics, the learning materials so that the students during this trying times, still can be able to cope up with their learning. Ang sekreto lang man subong is leading them to read. Because we have a limited time and resources especially when we are required magmeet up sa ila 1 hour a week. So an hour, I cannot hardly gather 100% attendance. Sometimes 50, or kis a 30. Kaagi gani 5 lang kami gatubangay. Same person from the beginning up to the end of the semester. [Yes, sir. We need to prepare for the topics, the learning materials so that the students during these trying times, still can cope with their learning. The secret today is leading them to read. Because we have a limited time and resources especially when we are required to meet of 1 hour in a week. So an hour, I cannot hardly gather 100% attendance. Sometimes 50, or 30. There are time that we are only 5. Same person from the beginning up to the end of the semester.]" (Teacher Pen, 61-69)

Need Extra Time and Resources. Time and Resources are vital in the teaching preparation especially this time of pandemic. More time gives more thinking or brainstorming on how to deliver things well. More resources gives teachers medium to deliver the pedagogy in a more effective way. More time and resources could contribute to the quality of teaching that leads to good student performance. This is exemplified in the excerpt of transcript below.

> "Kung sa academic performance,in addition sa more time in teaching preparation, mas mayo pa gid guro kung damo resources nga mahatag sa teacher para mas ma explore sang teacher ang other ways pa gid para mas improve ang academic performance sang kabataan. So amo na teaching preparation hours, additional resources. So amo man na gihapon dapat mangita alternative ways nga magtudlo sa kabataan. E give man gyapon consideration ang status sang kabataan kung ano sia. Ano ang resources available sa kabataan. In addition sa teachers, dapat lantawon man naton sa kabataan nga side kung paano ta sila ma reach. Or mga ways kungg paano man sila maka connect sa aton, sa school. [In academic performance, more time in teaching preparation and more resources to teachers could explore other ways to improve students' academic performance. In the teaching hours given to us, more resources are needed. We also need to find alternative ways to teach students. Consider the status of students like what are the resources of students. Moreover, teachers need to see that the student side on how we could reach them.]." (Teacher Charlie, 138-144)

University's Support to Teachers in Flexible Learning

Trainings and Workshops. Trainings and workshops before the start of the implementation of flexible learning were very evident. These trainings and workshops were in preparation for the new normal way of teaching and learning. This is evident in the excerpt of the transcript below.

> "Yes sir, I think indi man ini ma implement gid mayo ang flexible learning without the support of the University. [Yes, sir, I think this will not be implemented the flexible learning without the support of the University.] One, in particular, they had organized workshops for module making for teachers. That is good preparation for flexible learning as early as July last year. We had this module-making workshop, and then there were also constant reminders and announcements made by the University President, channeled through the campus administrator and the head of office instruction regarding flexible learning. I believe no one is prepared for this pandemic. But we can see the efforts of the University. Making sure that flexible learning is well implemented. Evident man siya actually, we can see the efforts of the people in the higher authority para lang ma implement ang flexible learning." (Teacher Kim, 31-45)

Load Subsidy. The university also extends its support to the faculty by providing them with an Internet Load subsidy which could help teachers with their internet bills. This is exemplified in the excerpt of the transcript below.

> "Yes, the support given by the university to its faculty by providing us load subsidy, free wifi connection inside the campus, and the online training conducted by the experts somehow helped us in the preparation of the implementation of flexible learning. Through webinars, we are trained on how to make our online classes efficient and effective." (Teacher Nicole, 44-51)

Module and Online Platform. They gave full support for developing modules and creating pathways to deliver teaching and learning on online platforms. One of the university's suggestions is to utilize the Facebook Social Learning Group to implement flexible learning. This is evident in the excerpt of the transcript below.

> "Nakabulig man siya, for example sa pagtudlo sa pagubra sang module, and then sa FB Social Learning Group kung paano siya gamiton for teaching and learning process. So amo to, pero basic knowledge ma lang nahatag nila. So more or less as a teacher ikaw man gyapon ma create ways kung paano mo siya mapa strengthen kung paano mo siya mapahapos sa mga kabataan. [It helped a lot, for example, in teaching to develop modules and then the Facebook Social Learning Group on how to use it for teaching and learning process. So, basic knowledge was only given. So more or less, a teacher should create ways on how to strengthen and make it easy for students.]" (Teacher Charlie, 48-54)

Delivery of Teaching and Learning in Flexible Learning

Teaching Delivery. One of the major problems before starting the implementation of flexible learning is the platform for teaching delivery. Teachers were experiencing some difficulties as they delivered their lessons because it is new to them that they cannot real see the whole picture of what is going on behind the camera when it is off while the teacher is discussing their lessons. However, this was addressed by the university by utilizing the Facebook social learning group. Aside from that platform, teachers were also exploring some applications that could help them supplement the teaching and learning process. This is exemplified in the following excerpt of transcripts.

> "Yes sir, I confidently say that I was able to deliver. Garing kay it is not for me to tell if my delivery of instruction was of quality or informative. I think my students to tell nu. Pero para sa akon, I did my part nu as teacher. I also have exhausted all means I have also exhausted all efforts available para lang ma deliver yung lessons to my students nu. So yes, I was able to deliver but if it's quality, if it's informative, if it's best, that's for the students to tell not me sir. [Yes, sir, I confidently say that I was able to deliver. However, it is not for me to tell if my delivery of instruction was of quality or informative. I think students could tell. However, for me, I did my part as a teacher. I also exhausted all means and resources available for delivering my lessons to my students. So, yes, I was able to deliver but if it's quality, if it's informative, if it's best, that's for the students to tell not me sir.]" (Teacher Kim, 210-218)

> "Kung sa delivery guro, on my part, tatlo ka subjects gintudluan ko. May subjects guro nga feelingko na deliver ko man siya mayo kay based man sa activities sa mga kabataan, naka answer man sila sang tsakto. Pero amo lang na, sa major subjects ko ga duha duha ako kay Nakita ko man nga muna. Daw kabudlay man sa kabataan kay wala sila face to face classes. Kay daw kabudlay siya e explain sa kabataan ang subject nga Math. [In the teaching delivery, on my part, three subjects that I taught. There were subjects that I feel that I deliver well my lessons based on students' activities. The students were able to answer it correctly. However, in the major subjects, I doubt that I was able to saw it. It is difficult to explain to students the mathematics subject.]." (Teacher Charlie, 127-134)

Teachers' Assessment in Flexible Learning

Assessment Strategies. Teachers find ways to deliver assessments in different strategies to minimize bias of the results. However, it is a difficult task in this time of the pandemic. This is exemplified in the excerpt of transcripts below.

> "Ang basis ko, they are going to submit there exam. May box ko to sa ano sa may dalum. Ginsubmit nila ila folder sa may envelope nga naka seal bala kag muna bul on, kag may answer na sila kara. Portfolio kag exam nila. May jan man sa online. May jan man sa portfolio. Indi perfect nga tanan sa online nag answer ah. Duro guro failure ko kung nagbase lang ako sa online. [My basis is that they will submit their exam in a box near the center gate, which is inside the school Portfolio and exams. There were also exams online. There was also a portfolio. Not all got a perfect score in the exam online. Most got failing scores based online.]." (Teacher Agatha, 134-142)

> "Yes aside from the essays, they had the activities. So sa activities ko varid man to, different methodologies. Indi ko lang siguro ma recall ano akon pinamutang sa akon activities. Pero not parts or essay, but the rest hindi siya essay, pero in essay form. Pero indi mo siya mahambal nga essay lang gid. Although essay siya guro in a manner of writing pero indi siya nga you're going to compose this or what. Pero ano siya eh written output pero style is essay. So all of them are written outputs. [Yes, aside from the essays, they had the activities. In the activities, it was given in varied methodologies. I'm not sure if I can recall what I've put in the activities. Not part of essays, but the rest is not essay form. I cannot say that all of it was essays. Although the essay was the manner of writing the answers, not like you are going to compose this or what. However, the written output but the style is an essay. So, all of them are written outputs.]." (Teacher Kim, 127-135)

> "With the use of simulator, I have a rubrics for that. Same na ang rubrics nga akon ginagamit before. Ngaa ara siya subong sa computer. They are sending me the copy of their work. E save na nila ang file then e send nila sa akon through the link that I am giving to them,the google drive. [With the use of a simulator, I have a rubric for that. The same rubric that I used before is now utilized in the computer. They are sending me a copy of their work. They will save the file and send it through a link that I am giving to them in google drive.]." (Teacher Pen, 81-85)

Accuracy and Reliability of Assessment. Teachers would say that assessment during the implementation of flexible learning is not accurate and reliable, especially when objective type was given to the students. This is exemplified in the excerpt of transcripts below.

> "Ay, indi reliable, indi accurate eh. Kung e compare mo. Sin o nga gwapa diyan nga maestra makuon nga accurate man. Bisan gani sa module. Tuod man sir. You cannot be sure of the students kung anon a man-an nila. mo gani kuon ko kanimo indi accurate measurements, evaluation mo kananda. Kay wara mo makita. Unlike sa face to face hudton mo pa lubot kung nagasunod to sa piyak. Bal an mo kung magexam ko, very strict gid ko sa mga kabataan. Wara ko na gapasunod. [It is noted reliable and accurate. If you will compare, who's a beautiful teacher there could say that her assessment is accurate. Even in Module. Sir. You cannot be sure if the students know it. That's why I told you that it is not accurate measurements and evaluation.]" (Teacher Agatha, 116-119)

> "Siguro if you talk about reliability, indi siya 100% reliable. But that's the best method of assessment so far that I could give to the students given the situation that we are in by giving consideration to the submission of students. [Maybe, if you talk about reliability, it is not 100% reliable. But that's the best method of assessment so far that I could to the students given the situation that we are in by considering the submission of students.]." (Teacher Kim, 118-123)

> "In terms of reliability, dapat intindihanay gid kita, leniency na lang. Importante may output. As an educator,I can really feel who really did their work. Eventhough, kompleto nila ang ila activity, but if you try to look at the other side, magkuha sang quiz, ang iba Kapila magattempt, nubo gyapon ang score. For the few nga performing assets na nga daan, magkuha quiz one shot lang taas na ang score. Makita mo siya eh. Ang iban those who are really hard up, I can really feel nga ga try gid. Even kaduha na nga try ginhatag ko, ang mga mahina gid siya lang gid ga strive wala siya nagayo bulig. Ang iban abot ko na eh, ginamagic nila. Ang iba makita ko kaduha siya magkuha exam, daw ginhawa ya lang makalab ot makapasar. Kapila ya na malantaw ang resources, na access ya na, gaduha duha ka pa. Kung diin ya ginpangkuha answer ya. Amo lang gid na. [In terms of reliability, we need to understand that we need to give leniency. They must have outputs. As an educator, I can feel who did their work. Even though they completed their activities, but if you try to look at the other side, when getting quizzes, others attempted so many times, which resulted in a low score. For the few performing students, they get the quizzes one time, which resulted in a high score. You can see it. Others are trying hard to answer. Even a couple of times, they've tried, but it resulted in a low score. Others are doing magic. Others are trying hard to pass. That's all.]." (Teacher Pen, 91-104)

Challenges Encountered by Teachers in Flexible Learning

Convincing Students to Join the Online Platform. Before implementing flexible learning, teachers have a hard time convincing students to participate in an online class due to so many factors, one of which is internet connectivity. However, most of the students attended online courses compared to students who chose modular learning. This is exemplified in the excerpt of the transcript below.

> "The challenges that I experienced before are raising the students and how to convince them to join the social learning group for our classes and gather them during the online sessions. I really need to understand their situation regarding finding of signal, or data. Iban gaprangka gid,wala ko sila load. Wala gid ako mahimo. Okay lang I can reach up to them eventhough past 12. Iban may ara gid nga estudyante nga Sir, alas onse lang ko maconnect sa gabi. Kay wala signal kung adlaw.

[The challenges that I experienced before are raising the students and how to convince them to join the social learning group for our classes and gather them during the online sessions. I need to understand their situation regarding finding signals or data. Others have no mobile data load. I cannot do that. It's okay, and I can reach up to them until midnight. There are students, sir, that communicate to me at 11 pm because it is the only time that they have a good signal compared to day time in their place.]." (Teacher Pen, 127-135)

Internet Connectivity. Having an unstable internet connection in an online class is a significant issue in learning asynchronous. Not only students experience this unstable internet connection but also teachers. This is exemplified in the excerpt of the transcript below.

"Challenges siyempre luwas bi sa, una una bi sa physical nga internet connection, kay ti gusto ta online learning mo kay wala ta face to face, so ang pinaka issue gid da ang internet connection, ang availability niya. Kung may internet connection man, ang speed niya. May diyan nga may internet kami sa balay pero hina hina iya nga signal. May barayad ako pero hina ang signal. Ang mga bata ta, wala na signal, wala pa barayad. Muna bala, kita ya okay lang makaya naton. Pero mga estudyante ta indi ta man sila ma force. So budlay budlay gid ya kung online. Kung flexible naman ya, tawag gani nga indi man sila kakadto sa school, kung ma pliti man sila, sobra pa sa online. Kay ti magasto man sila gyapon kay makadto man sila sa banwa. Anyway, amo na ang some challenges, plus ang aton nga pacing. [Challenges, first is the internet connection. Because we wanted online learning and there is no face-to-face, the biggest issue is the internet connection and its availability. If there is an internet connection, the speed is the problem. We have internet in our house, but it is unstable. I have money to pay but poor signal. Out students have no signal or unstable signal, they cannot pay also. We, teachers, can do it, but our students, we cannot force them. It is tough to have online classes. Inflexible, they cannot go to school if they go to school is more expensive than online. Still, it is expensive. Anyway, these are some challenges plus our pacing in teaching.]." (Teacher Shine, 342-368)

Online Classes Delivery. Teachers encounter challenges in online class delivery, especially in assessment and evaluation. Teachers express concerns on that matter. This is exemplified in the excerpt of the transcript below.

"Tapos kara, budlay magtugro ka evaluation, budlay magtugro ka exam. Nabudlayan ako. Why? Kay indi ko gid ma sure nga that is their own answer. Pwede ka kapamangkot may time ka pa. Buhay pa gyapon ma submit. Duro gid nga challenges. Gina una to avoid bala, may best remedy nga ma avoid nila copying. Nabudlayan gid ako, I really encountered a lot of difficulties magimpart knowledge sa mga kabataan. That is because wala sila gajoin. Paano mo maman-an. Mamangkot ka, "Any question", "Do you have any problem?", "Ma'am hina signal." Amo lang na pirmi. Ti paano mo ra mabal-na nga kamaan sila or indi? Igo magturgo ka kaquestion, buhay pa na maganswer. Pagaabot pa ka answer, daw parareho pa ka answer. [After that, sir, it is hard to give an evaluation, challenging to pass the examination. I find it hard. Why? Because I am not sure if that is their answer. Can I ask if you have time? The submission is so delayed—a lot of challenges. To avoid it, the best remedy is to prevent copying. It's hard. I encountered a lot of difficulties in imparting knowledge to students. That is because they do not join the class. How will you know, you ask, any questions? Do you have a problem? Students will answer that their signal is low. That is always their reason. How will you know that they learn from you? If you ask them, waiting for so long for their reply. (Teacher Agatha, 201-220)

Development of Modules. One of the biggest challenges before the start of flexible learning is the development of modules. This is exemplified in the excerpt of the transcript below.

"Before the implementation of flexible learning, the biggest challenge that I encountered was the process of creating three different modules since I have three preparations, and due to the lack of time, I wasn't able to upload the modules all at once. During the implementation of flexible learning, some learners don't have a stable internet connection, and not all of them can join in the online classes that I conducted." (Teacher Nicole, 110-126)

Time Spent in Checking Activities or Exams Online. Checking quizzes, activities, examinations, and outputs takes time because some students submitted late, and others were early to submit. This is exemplified in the excerpt of the transcript below.

> "Sa challenges guro ti amo na eh ang damo nga check an via online. Kag it takes time gid mag check kay tanan puros online. Then amo na ang isa ka problem ang internet connectivity. Kay indi ka man kapang check kung mahina imo nga internet o guba imo nga internet. Kag isa pa guro nga challenges sa kabataan man mismo. Ang iban kalabanan man sa ila pigado sa finances nila. So kag ila man nga internet connectivity. Ga apekto man sa aton nga strategy as a teacher. Kung paano naton e tudlo ang isa ka subject kay ga depende man kita sa kabataan. Kay karoon kung gapamilit kita saisa ka bagay nga gusto naton himuon, tapos ang kabataan indi man sila kaconnect sa aton ti ka useless man gyapon. [In the challenges, lots of checking online, and it takes time to check if all are online. Then, one of the problems is internet connectivity. Because you cannot check well if the internet connection is unstable. One of the problems also is the students. Other students are financially unstable, and also their internet connectivity. It also affects the strategy of the teacher. On how we teach one subject also depends on the status or needs of the students. If you do it compulsory, then the students cannot connect, it's useless.]." (Teacher Charlie, 167-179)

Stress Encountered. Teachers also experience stress during the implementation of flexible learning, especially on the university's requirements on what to do. The teachers were still in the adjusting stage of this new way of learning.

> "Yes sir, I said a while ago sir, you need to constantly check your group chat or messages. At the same time checking the outputs. Daw ka ano gin man sa oras, pero wala ikaw mahimo. This is what is required of us. Checking of outputs or activities and then daw ikaw lang man ga absorb man sang stress sang mga bata. Because they constantly inform you, sir nabudlayan ako, sir paano ni, paano ni sabtan. Can you explain further kung paano ni siya ubrahon. So amo ni ang mga challenges during. Then after naman, actually mahambal ko siguro after the implementation of flexible learning parang there was a sigh of relief. Kay actually ang ano gid ara sa during kag before. After ang stress mo na lang siguro, yung challenge na lang siguro ang checking of outputs. So far wala man gid ako nabudlayan almost all of the students pass. Ang mabudlay lang da nga part may iban nga estudyante wala naka pasa. So you need to message each of them kung nakapasa naman gid sila bala. Kung wala, you are going to ask them when they are going to pass, when are they going to comply. Daw muna na man lang ang challenge after the implementation of flexible learning. Somehow, na survive ko man ang flexible learning. [Yes, sir, I said a while ago, sir, you need to check your group chat or messages constantly. At the same time, you are checking the outputs. It takes time, and you have nothing to do with it. This is what is required of us. Checking of outputs or activities, and then you absorb all the stress from the students. Because they constantly inform you, sir, that you have a hard time. Students would ask you, sir, it's hard, sir, how is this? Can you explain further if how this works? These are the challenges. After the implementation of flexible learning, there was a sigh of relief. Those happen during and after. After the stress, the challenges in the checking of outputs. Somehow we survive.]" (Teacher Kim, 221-242)

Coping Strategies of Teachers in Flexible Learning

Embracing the New Normal. One of the coping mechanisms that the teachers did was to embrace the new normal in this new way of teaching and learning. This is exemplified in the excerpt of the transcript below.

> "I embraced the new normal setup by incorporating technology into our new practices, and it gives me a more personalized learning experience to my students. I engaged myself in-home activities like gardening and spending more time with my family to console myself." (Teacher Nicole, 133-140)

"Coping sir. I think coping sir will still continue unless there is still pandemic. Kay bal an ta man ang challenges indi na siya magstop as long as there is still pandemic. But somehow we can adjust to the set up. But if you are going to ask me ang coping mechanism ko, kung ano ang coping strategy ko. Well I just try to be open minded, gina labaan ko gid akon nga patience. What else, gina consider ko man ang flexible learning as, it will test your creativity nu, as well as well as teacher. When it comes to responding the needs of the situation. So, another strategy is stay healthy kay ti syempre kung magminasakit kita subong, I don't know kung anon a lang ni matabo sa aton mga estudyante. Kay wala man may mabulig sa aton, wala man may ma relieve sa aton if something happens. So be open minded, stay healthy kag ginalabaan ko gid patience ko sir, that's how I cope—[Coping, sir. I think coping, sir, will continue unless there is still a pandemic because these challenges cannot be stopped as long as there is still a pandemic. But somehow, we can adjust to the setup. But if you are going to ask me about coping mechanisms, if what is my coping strategy. Well, I try to be open-minded. I prolonged my patience. What else, I consider flexible learning as it will test your creativity and you, being a teacher. When it comes to corresponding to the situation's needs, another strategy is to stay healthy not to get sick. Be open-minded also, that's how I cope.]" (Teacher Kim, 245-260)

Discipline and Time Management. Discipline and Time Management play an essential role in the coping mechanisms of teachers. Having good time management can be a good help to make the online classes meaningful and fruitful. This is exemplified in the excerpt of the transcript below.

"So, just a matter of discipline and time management and I invested on devices. I upraded for another laptop and applied for a stable connection diri sa balay [here in the house]. Even though before I am using prepaid and relying on my cellphone. During the times na kinahanglan na gid sa [that you need it in online, so I applied for a fix connection diri sa balay [here in the house]." (Teacher Pen, 150-155)

Finding ways to Conduct Laboratory Activities. Conducting Laboratory-based course subjects are difficult in this time of the pandemic due to work from home situation. However, teachers could find ways to conduct these activities online using available online or mobile applications. This is exemplified in the excerpt of transcript below.

"Ang mga upod ko di sa IT gaproblema gid kay laban kami may laboratory mong kay IT gani. Pero ako nangita gid ka way nga somehow the students will be able to experience the laboratory or the hands on activities. Since naga ano ako nga sa phone lang ang available nga device or indi man tanan may laptop mo. Especially mga 1st year something like that. Or even mga 3rd year namon nga IT. So phone lang gid ang basic nga available nga device. Naglearn ako sang app kung diin pwede namon ma perform ang activity. Nga ang concept kag ang experience mo sa programming, nag pa install ako sa mga bata. Gin recommend ko ang app nga pwede nila ma download from play store o ano man da nga app nga pwede sila ka download sang applications sa mobile phone nila. So sige man gyapon amon nga laboratory activity pero ang experience nga sa computer gid tani indi siya amo sina eh. Indi lang siya realistic, but somehow I was able to deliver the hands in activity on my students sa amo na nga course. [My colleagues here in the IT department have a problem with laboratory activities in IT subjects. However, we find ways to make students experience the laboratory or the hands-on activities by installing applications in the play store that they can download. That particular application can be used as a platform in programming laboratory activities. Teachers were able to deliver the hands-on activities at home in the course subject.]." (Teacher Shine, 109-126)

Not Giving Deadlines to Students. Considering students is also essential in this time of the pandemic. One of the coping mechanisms that the teacher did was not to give deadlines for the activities or tasks assigned to students, not be pressured too much, and experience stress and depression. This is exemplified in the excerpt of the transcript below.

"So wala lang ako gahatag deadline, gina hambalan ko lang nga basta before mid term exam, mapasa niyo lang ang mid term requirements. Before final exam, mapasa niyo mga final requirements. Pero bisan pa, bilog gani nga mid term kag final gintingob ko na lang. Ang mid term requirements dangat na lang final ang time frame bala ang hatag ko. Para kung baga may enogh time sila to comply. [So, I did not give a deadline. I told the students before giving midterm examinations and submitting midterm requirements. Before final examination, the students consolidated all their activities and submitted it to me so that students will be given enough time.]." (Teacher Shine, 371-396)

Coping with Stress. Teachers also experienced stress. Teachers were able to cope up with this stress. This is exemplified in the following excerpt of a transcript.

"Himo ka naman another strategy. Kag indi ka lang sagi ka stress ah. Enjoy mol ang life nand, kung indi man sila magsubmit, you just wait eh. Bisan ma butang ka deadline of submission you have to adjust pa gid. Kay ang deadline mo may another pa gid. For example ang strategy ko pa gid. Paryos naghambal ka kagina, online akon exam. Nagtugro pa gid ako sang module ko, dira pa gid ang akon exam nanda. Kundi last module nanda, para ma measure mo pa gid. Paano mo sanda ma grade an kung wala ka mga answer. Ma compare mo ang online mo nga class sa puro lang module. Akon daw sobra half wala sila ka join sanda sa online class. So nag adjust gid ako sir. Kung indi ko magadjust di ko karon ka submit grade on time. [You make another strategy and do not let yourself be stress. Enjoy your work and your life. If students can't submit, just wait. Even you put deadlines, and you have to adjust again. Just like giving a module and exam, in my class, half of the class chose modularly. Half of the class chose online. If you don't want to be stress, you must adjust.]." (Teacher Agatha, 222-237)

Teachers' Suggestions in Preparation to Flexible Learning

Hands-On Training of the Basics in Software Application for Online Learning. Some teachers were not knowledgeable in some of the primary software applications or platforms used in online learning. They suggested that hands-on training should be done to make them ready for the implementation of flexible learning. This is exemplified in the excerpt of transcripts below.

"Especially sa amon nga medyo may edad edad, wiliing tamon maglearn. Gusto pa gid namon matraining. Nami kay na training kami ni Ma'am Perlas to on how to prepare ka mga grade sheets namon. Nami pa gid nga daw basic pa gid nga amo ka ja amo ka ja. [Especially to us oldies, we are willing to learn. We want to have training. Ma'am Perlas was excellent to be our trainer on how to make grade sheets and especially some basics of Microsoft applications.]" (Teacher Agatha, 52-56)

"Kulang pa gawa. Ti siguro wala na sila ti time. We need pa gid man tana another training para panubigtubig kanamon kay gusto ko pa gid makalearn mo. More trainings pa gid especially sa Google Meet mayo gani kay indi gid ko kamaan ka Google Meet, Zoom. Kung kaisa garing daw may diyan pa gid ko nabudlayan bala mga Powerpoint. Kay naga Youtube ako bala sa studyante ko na magpresent sa Powerpoint. Kis a indi ako kasulod. Nabudlayan ako nagapamangkot pa gid takon. [It is not enough. I think they have no time. We need more training to learn a lot, especially on how to use Google Meet or Zoom. What we were doing was watching youtube videos. It is somewhat a self-study. Like using PowerPoint in sharing in an online session. Sometimes, we ask our colleagues if we have a hard time.]." (Teacher Agatha, 76-83)

Intensifying Information Dissemination about Flexible Learning. Strengthening the information dissemination about flexible learning to students and teachers is also essential, as suggested by some teachers. This is exemplified in the excerpt of the transcript below.

"Siguro kung may recommendations man ako para sa ila, intensify more, information dissemination, about the implementation of flexible learning. Then intensify pa gid ang efforts like ano pa gid nga workshops nga pwede pa gid nila ma extend to the teachers nu. [If there will be recommendations, I think intensifying more the information dissemination about flexible learning. Then, intensify the efforts like having workshops for teachers.]"(Teacher Kim, 266-271)

Dialogue with Teachers and Students. The university also needs to hear the needs of the teachers and students so that the implementation of flexible learning will be smooth. Addressing these concerns is very important. This is exemplified in the excerpt of the transcript below.

> “So maybe a dialogue with the teachers and the administration para ma voice out naton aton mga concerns and dira man nila mabal an aton mga concerns or for the better implementation of flexible learning. [So maybe a dialogue with teachers and the administration must be conducted for the teachers to voice out their concerns for the better implementation of flexible learning.].” (Teacher Kim, 281-286)

Early Released of Teaching Loads. One of the significant suggestions of teachers was to release teachers' teaching loads early so that more time preparations for teachers could be done. This is exemplified in the excerpt of the transcript below.

> “So far sa amon ano sir department, before magabot ang another semester, bal an nanamon amon nga load. So we are really prepared for that. Bal an na namon ang pagpasunod namon. As much as possible, during the start of the semester, at least maka 50% ka na sa imo nga mga learning materials. Para sa sunod nga semester ma preparahan mo naman. [So far in our department, before the semester start, I already know my teaching load. So we are prepared. As much as possible, during the start of the semester, at least 50% of your learning materials so that in the next semester you can prepare earlier].” (Teacher Pen, 160-165)

Conclusion and Recommendations

New normal was a big challenge to the teachers—new teaching methods, new platforms to explore, and new ways of assessing students learning. However, teachers were able to surpass this challenge by preparing well before the implementation of flexible learning. During the implementation of flexible when taken as a whole program, the level of teacher preparation was described as prepared. Teachers were oriented and trained through seminars and workshops before the start of the flexible learning implementation. It was clearly shown that teachers in each program were also prepared. Teachers were determined to be ready in this time of the pandemic. Teachers showed a significant preparedness to face the challenges they will encounter during flexible learning regarding technology access, teaching styles, strategies, and course design. However, course design and time management were moderately prepared due to the teachers' experience. But it did not stop them from continuing the passion and determination to deliver their lessons and make students learn and unlearn things through asynchronous or synchronous learning modes.

Despite teachers’ difficulties in adapting to the new teaching and learning methods, student academic performance was revealed as very good, which indicates that teachers’ efforts to deliver the lessons and activities to their students through an asynchronous or synchronous mode of learning were implemented well. Moreover, teachers were able to adapt well to the new normal, especially the flexible learning approach.

In teacher preparation, there was no statistically significant difference when taken as a whole. However, when looking at the subcomponents of teacher preparation, Technology Access, Teaching styles and Strategies, Course Planning and Time Management, and Course Design, there was a statistically significant difference in technology access and course planning and time management. Faculty members in some programs were highly prepared in technology access and course planning, and time management, while in other programs, they were moderately prepared. One of the factors is that some of the faculty members are unequipped with technological knowledge, especially on the use of basic applications in a computer and the utilization of internet platforms that could be used for online classes.

In students’ academic performance, there was a statistically significant difference in students’ academic performance between different programs when taken as a whole. Various programs perform well;

however, a difference occurs in the average mean of their performance. Student academic performance was revealed as very good. Students could perform well in class despite this pandemic, whether in an asynchronous or synchronous learning mode. The pandemic does not hinder their determination and perseverance to continue their education and finish their course degree. Education played an excellent role for the students to lift their socio-economic status from poverty.

Teacher preparation does not correlate with students' academic performance when taken as a whole. Teacher preparation and students' academic performance are independent of each other. Teacher preparation does not intensely affect students' academic performance; however, there are factors that teacher preparation can affect students' academic performance. The teaching strategies, module preparation, and delivery of the teaching and learning are factors that could affect students' academic performance.

Students made some preparations before the start of the flexible learning, like mobile load preparation. In the Philippines, most public schools cannot afford to buy laptops or tablets. Most of them used mobile phones for communication to school and online classes. They also learned to embrace the new normal, for this will be the situation of our educational system in the coming months or years. However, they hoped that everything would be back to normal as it used to be.

Students shared their perceptions, learnings, and experiences during the implementation of flexible learning. In teacher preparation, teachers asked them of their learning mode to choose an asynchronous or synchronous learning mode. They have the freedom to choose; however, they cannot choose both. Students were able to give their rating for the level of teacher preparation in which they rated it as prepared. Even teachers were still adjusting to the new setup of teaching and learning, and students still rated them as prepared. Students perceived that teachers' modules were appropriately arranged. Teachers were also struggling to deliver their activities or lessons; however, they appreciated their teacher's efforts to do their best to deliver their lessons. Students observed that most teachers were considerate to them, especially in submitting their outputs in their activities. Students also realized with regards to their situation, and they also shaped their learning. Being patient is one of the realizations of students that despite the challenges encountered, and they need to be patient. Students believed that Teacher preparation helped build students learning. They thought that prepared teachers enable students to explore the topic by motivating them to explore more on the internet and answer their activities virtually. Teachers were able to use different platforms in delivering their assessments to students. However, students could perceive the disadvantage of online assessment, which was the unstable internet connection, objective tests are prone to cheating, and unreliable results. Students shared their view of fair assessment in this time of the pandemic. They said fair assessment could make a difference to get the grade that they deserve. The objective type of assessment is not a fair assessment in this pandemic because there are many ways to cheat. Students preferred the authentic assessment, which could be gauge through performance-based activities.

Students encountered so many challenges during the implementation of flexible learning. First is the internet connectivity issues in which students' location or area have unstable signal or no signal. Students believed that it could affect students learning and also their academic performance. Second is the unavailability of tools and insufficient discussion of modules online. Students observed that modules uploaded online and used by teachers to teach online were not discussed sufficiently. The third is the adaptability of a new way of learning. Students are struggling or still adjusting to the new ways of teaching and learning process. Fourth is the stressful situations for students. Students' stressful situations were given simultaneously, and due dates were set in which students were confused on what subject they will work out first. Their health, especially their mental health, is also affected. Fifth is the lack of family support. Students experienced a lack of support from their parents like guidance or cellphone, mobile loads, wifi, and other means to connect to the internet. Last is home distractions in learning. Students encountered distractions like asking for errands from parents and the noise of vehicles outside their house. These distractions could disturb students' concentration or focus in their online classes or their module activities.

With the challenges encountered by students, they find ways to cope up. First, they find ways to connect despite internet connectivity issues. They borrow mobile phones from their older brother or sister.

They find a spot or an area wherein internet connectivity or signal is stable. Second, a compilation of activities. Students compile their activities like a portfolio and submit it all as one to their subject teacher. Third, time management. Scheduling of their activities or tasks was their strategy to balance their work at home and online classes. Fourth, ways to cope up with an assessment. Students are resourceful and wise in answering their quizzes or examinations by searching the answers in the module or the internet. Fifth, ways to cope up with tasks and stress. They do their hobbies to cope with stress, like gardening, which could help them relieve their stress—last, self-motivation and peer support. Students motivate themselves by pursuing such tasks that they can do, and peer support uses prior knowledge to help fellow peers do activities or tasks asynchronously or synchronously.

Students also gave their suggestions to teachers in preparing their course subject. These are the following suggestions: (1) reaching out to students with regards to their concerns or needs, (2) being considerate, (3) giving specific criteria or rubric to outputs or tasks given to the students, (4) extended deadline should be put in every activity for them to have a goal, (5) strengthen the continuing education plan, and (5) creating webinars about online platforms to be used.

Before implementing flexible learning, teachers participated in webinars, training, and workshops to enhance their skills in the different technologies that can be used during asynchronous or synchronous modes of learning. Teachers also decongest the curriculum in the syllabus that could be achieved throughout the semester, but these topics are essential for students to learn. Online platforms were also explored for teachers to conduct synchronous modes of learning. Module making was also one of teachers' preparation. Teachers also affirmed that teachers' preparation could contribute to students' academic performance. Extra time and resources are needed by teachers for preparing their learning materials and teaching strategies to be used in the semester. Teachers felt the university's support by giving them training, webinars, workshops, and load subsidy. The online platform used to deliver their lessons is the Facebook Social Learning Group. It is an easy platform wherein students already have a Facebook account and easy to communicate with the students.

Teachers encountered challenges during the implementation of flexible learning. The following are the challenges that they've experienced: (1) convincing students to join the online platform, (2) internet connectivity, (3) online classes delivery, (4) development of modules, (5) time spent in checking activities or examinations online, and (5) stress encountered especially on the requirements of the university on what to do.

With the problems encountered by the teachers, the following are their coping mechanisms: (1) embracing the new normal, (2) self-discipline and time management, (3) finding ways to conduct laboratory activities, (4) Not giving deadlines to students, and (5) coping with stress through enjoying what they are doing especially teaching. With these coping mechanisms, the teachers successfully delivered their lessons and surpassed all the challenges they have encountered.

Teachers also gave their suggestions for the university for teaching preparation. They suggested that there should be hands-on training on the essential software application for online learning to be ready next semester. In addition, information dissemination with regards to flexible should be intensified. The university should also look into the concerns and needs of the students, teachers, parents, and other stakeholders with the implementation of flexible learning.

This study will serve as feedback to the university regarding the teacher preparation of university faculty during flexible learning. It will serve as a guide for the university to strengthen the training, webinars, and workshops for teachers in preparation for the following semesters or school years. It would be better if the study would involve participants from the main campus and external campuses to determine the status of the whole university with regards to the teacher preparation and students' academic performance. The researchers were hoping that this research study would help the Iloilo Science and Technology University – Miagao Campus to improve the teacher preparation program by presenting these significant experiences among key officials of the university. Lastly, this research study would serve as a springboard to the next generation of researchers to investigate more profound the teacher preparation experiences and student academic performance in the flexible learning approach using other mixed-method research designs.

Acknowledgement

I would like to thank the Faculty, Students, and Staff of Iloilo Science and Technology University – Miagao Campus for the full support in the realization of this study.

I thank the Lord for the guidance and strength to finish this endeavor.

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Students' Playlist: Integration of Songs in Teaching the English Subject

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Abstract - This study explored the experiences of five (5) Junior High School English Teachers who integrate songs in the English Subject in Pampanga. The data was gathered through semi-structured interviews done online using a qualitative-phenomenological research design. This qualitative study used the purposive sampling technique in the selection of the participants. Based on the findings, the participants' ways of integrating songs were through the use of participants' favorite music, popular music, and/or music connected to the topic. The findings showed that the participants' purposes in integrating songs were to improve students' fluency in the English language, to improve their comprehension, creativity, and critical thinking skills, to boost their interest in the subject, and to enhance their knowledge retention. Through the integration of songs, the participants observed the active participation of students, improvement of social skills, grades, and memory. This study recommended that teachers may develop a playlist or list of songs connected to their topic that they can use in their discussion.

Keywords - English Subject, Song, Integration, Students, and, Teach

♪ Every time I hear our music play
Reminds me of the things that we've been through ♪

Music evokes a part of us. It is evident from the lyrics of Alamid's Your Love that music carries memories that one can impossibly forget. Through the ages, music has become an excellent way for humans to express their emotions and sentiments. According to Proverbio and Russo (2021), music has the power to arouse certain feelings in the listener. It activates a specific part of our brain depending on the music genre we listen to.

Music can be regarded as an essential part of a culture; that's why it is classified as an indispensable component of humanity (Piri, 2019). It can be found almost everywhere: on the street, at a show, at homes, on our gadgets or radios, at school, and even in classrooms. Music is one great way of communication, for it surpasses time and space. It knows no boundaries and follows no guidelines. Through its tune, waves of emotions can be imparted from one soul to another. (Hurtado, 2017)

According to Skeen (2015), music also can relax a person's body. Hence, it can also relax the mind. The way the auditory system processes sound results in our reactions toward music. The sound it emits as it enters the ear may result in positive or negative implications depending on a person's music taste.

Aside from this significance mentioned above, Khaghaninejad (2016) also asserted that music had been proven to have a vital role in early language acquisition. It dramatically boosts the language learning of an individual. Throughout the years, experts from various fields--scientists, philosophers, therapists, and teachers have acknowledged the role of music in developing the human body. Fahandejsaadi (2016) asserted that researchers had unfolded significant discoveries about foreign language acquisition theories for the past twenty years. There is a lot of developmental and historical evidence that proves how surprisingly convincing the didactic mixture of music and language is.

Today, education should be acknowledged as a critical factor to a modernized society and a necessary part of a person's journey of success, forasmuch as learning is deemed a vital component for a person's growth and development. The desire to face the changes that are brought by the 21st century is highly discerned in contemporary theory and the practice of pedagogy, which consist of the application of life-long learning, quality education guarantee, planning of an individual for life, and successful professional activity despite the rapidly changing social and cultural conditions. (Rauduvaite, 2018)

Acquiring a new language using pedagogical methods in the learning process is not a novelty anymore. For many years, music has been a subject that has been used in this field as a teaching tool. Music is a catalyst for improving academic skills such as vocabulary and grammar and developing shown language ability. (Niño, 2010)

Teaching English to young students involves more than just language instruction. This challenging method must consider the social and cognitive progress of the students. To do this, it is crucial to make an environment that resembles the one that is natural to children. To create a natural, anxiety-free environment, teachers should provide exciting activities. Songs are certainly among the enjoyable exercises that can be used to help students learn a language. They should not pressure students to deliver the speech right away but rather wait until they are ready. (Dzanic, 2016) When students have music in their lives starting at a young age, they have a higher chance of retaining information, improving decision-making and problem solving, processing and producing speech sounds, controlling behaviors, and decreasing chances of having dyslexia. For example, a classroom that uses music and reading in a specific activity will help teachers enhance students' reading and music skills. (Gauthier 2005)

Music aids language acquisition, according to research from a variety of disciplines, and this writer's classroom experiences with music have been positive. While generating music exercises from scratch can be difficult for busy professionals, playing music in the background can help students learn. There are various textbooks with pre-made song lessons (Strokes, nd). Music in language courses can help pupils learn new words and create a more cheerful atmosphere in the classroom.

In the words of Salcedo (2010), music or songs can be a creative instrument to help the students increase their vocabulary, which is an indication that there is success in language learning of students when they learn vocabulary words. Numerous schools are using this strategy to help their students learn and improve their behavior. The use of songs is an effective way to help the students learn more vocabulary than the usual teaching style. According to Šišková (2008), students have an easier time accessing new information when comfortable and free from pressure. Listening to music can make students comfortable and motivated in doing their activities. Being motivated helps students to have a long retention and attention span in learning new vocabulary. Using music can draw students' attention to absorb a new language.

According to a University of Edinburgh study, there is a significant link between music and memory-linked regions of the brain engaged while listening to or performing music and speaking or understanding words. Singing foreign language words or phrases helps us remember them later. Wallace (1994) constituted the idea that music aids memory in his early findings. Also, he found out that it is easier to recall a text if it is set to music than a text that is only spoken. He theorized that a text delivered in a rhythmical spoken pattern falls into a significantly lower category of remembering than a text interpreted with music. Thus, Wallace said that many EFL professionals prefer to use rhythmic activities to teach English. Instructors must further upgrade language acquisition by accompanying melodies and songs to their curricula.

Therefore, teaching English with songs is an effective way to get the students' attention in class. Since a piece has many unfamiliar words and phrases with various themes, students can learn some new vocabularies and language rhythm, and grammatical structures relevant to the English subject. English songs are often easy to listen to that the students can enjoy while learning. It can also be a help for students to improve their memorization skills. (Pratiwi, 2018)

Several writers have agreed that using authentic resources such as songs in the language classroom motivates and attracts students. Learners show more participation, making songs an excellent way for teachers to introduce and promote the target language. Academic tasks with the use of songs can excite the students in the class. It can also break the psychological barriers, such as lack of self-confidence and discomfort of the learners. In addition, it can help them to be motivated to acquire the target language. (Shen, 2009) Combining music in students' learning can unveil many possibilities to teachers in teaching their students through songs and give students a unique way to learn. When students are allowed to express themselves through music, they can center their energy and be flexible in their learning by singing songs and playing an instrument. Music gives students different ways to gain knowledge and engages them to learn new things differently than sitting at a desk all day. (Pacini, 2019). According to Nord Anglia Education (2020), musical training and language understanding depend on the same part of the brain, which is the temporal lobe. Therefore, children who are somehow exposed to music will have a piece of more excellent knowledge in tone and speech alignment. Music is also one effective way of language learning. Bonnel et al.(2001) showed that music and language are processed in the brain separately. This means that concentrating on both music and language at the same time should not interfere with either's memory. Playing music while teaching language to pupils will neither distract nor prevent them from learning new linguistic patterns. On the other hand, music will improve language acquisition on cognitive levels, particularly in memory.

Wallace's (1994) findings back up the notion that music might help with memory. He discovered that wit is remembered considerably better when a text is put to music than spoken. Wallace found that text set to music is recognized significantly better than text spoken in a rhythmic sequence. Thus, though many EFL professionals effectively use rhythmic recitations to teach English, instructors may further promote language acquisition by adding actual melodies and songs to their curricula. Applying classroom lessons to the outside world is one of the reasons why the school curriculum was built. With this, the students' musical individuality can help the teachers practice their critical thinking skills to use long term. (Woodford, 1996)

Scott (2004) proclaims that research has shown that music can increase the blood flow in the brain. Studies have established that short bursts of music can increase blood flow in the brain’s left hemisphere, which will lead to a burst of energy. Kalivretenos (2015) stated that when schools have integrated music into their curriculum, it will give them an atmosphere to relax and decrease stress and anxiety about school. For students, having music classes is not something they will participate in for having a grade or putting it in a college application. But students participate in music classes because it is something they enjoy and want to be part of.

Additionally, a study shows that music can enhance one’s academic achievement, self-esteem, national pride, cultural identification, and overall self-confidence. Depending on the preferences, music can also be soothing, relaxing, inspiring, and motivating. It can also help the learning process when used precisely in the learning situation (Israel, 2013). Having said the importance of music in our lives as humans, it is reasonable to believe that using it to teach the students speaks excellent relevance in our society to maximize students’ capacities and communication skills. There is a traditional belief, however, that contradicts the said fact above. Music is considered by most people as an accessory in life, not a part of it. Furthermore, it is deemed as an entertainment discounting the essential essence it provides. In the education sector, it was also used as just a complementary tool whose only purpose is to give joy while learning at the same time. (Echeverría and Araneda, 2015)

According to Ferroni (2013), it is no longer surprising that music has several good characteristics when used as a teaching tool in schools. When students can take a new way of learning things like learning with music, students will feel excited and happy. They will feel interested because they are using a new way of learning, rather than having the traditional way of learning "by the book" and being stuck at their desk all day listening to the teacher's lecture. Students are assigned to take some music related to a specific event during the Ferroni class project and make it relative to the particular event. It will practice their skills of understanding and long-lasting knowledge.

As quoted by Niño (2010), Catterall asserted that music could tickle a crucial part of a learner’s cognitive abilities. Music helps learners improve their unique reasoning (e.g., reading and writing skills and verbal competence) by listening to musical concepts. Language teachers' use of music in the classroom can be influenced by a better knowledge of the cognitive processing of music and language. Bonnel et al. (2001) sought to see if there was evidence for separate music and language processing in the brain. They point out that, even if melodies and words are originally heard simultaneously, the issue of whether the brain continues to process them jointly remains unanswered. Bonnel et al. used a dual-task paradigm to divide participants' attention between melodies and lyrics to examine the brain's internal processing.

Maintaining students' interest during the lessons will be a significant factor challenge for all the teachers. Therefore, teachers should be very flexible in teaching methods, Simpson (2015) since learning is a prolonged process that requires a student's inward skills and how the teacher integrates the knowledge in any subject. (Niño 2010) Even though Gardner (1993) has theorized about the multiple intelligences of different learners, we also have to consider the appropriate approach to impart knowledge to the learners effectively and the various practices that will make learning easier for students. (Niño, 2010) Music's universal appeal, which connects people of all cultures and languages, makes it an effective teaching tool. As a result, it has become one of the most effective and motivating teaching tools. (Simpson, 2015)

Integrating songs in the English language classroom improves learners' academic achievements to make learning a regular, fun, and helpful activity. It is proven to have a wide range of psychological advantages that helps students relax. It bridges the gap between all languages. This is one of the most effective ways to motivate the students to learn in their English class regardless of their age and background. (Kawrow, 2018).

McCarthy (1985) states that using music has a good effect on students' language development. He adds that word recognition, comprehension, reading study, and literary appreciation are reinforced by songs. He further explains that integrating songs and rhythm gives practice rhythm, form, dynamics, mood concepts, and skills common to language and music.

Language and music are believed to be solid culture-makers and can be appraised as a complementary aspect of the people's communication toolkit. (Cross, 2009). Gregory et al.(1996) discovered that culture might influence how listeners respond to music. He found that the primary mode is connected with sentiments of happiness in Western musical cultures, whereas the minor method is associated with feelings of melancholy. When the findings of Stratton and Zalanowski (1994) are examined, this knowledge becomes vital to teaching English. The nature of a piece of music can impact a listener's mood, according to Stratton and Zalanowski (1994), with gloomy tunes boosting feelings of depression. Depressive feelings heighten learners' emotional filters, which can obstruct language acquisition. Language teachers might reduce emotional obstacles to learning by choosing music written in major modes. Language teachers may wish to include music that inspires sentiments of enjoyment in the students' native cultures while teaching students with non-Western musical backgrounds.

According to the study of Stratton and Zalanowski (1994), the study discovered that melody alone would not have a significant effect on the listener's mood unless it is accompanied by lyrics. Also found in the study is that depressing songs affect the increased feelings of depression, regardless if it is a different type of melody to which the lyrics were partnered. The data tells that language teachers would have to select songs with joyful and positive lyrics to lower the effects of the affective filter, and Fisher's (2001) study supports this idea. In Fisher's (2001) study, examples of two classrooms that used music began with a group song with a positive message each day, like having good self-esteem. In the researcher's observation notes, Fisher remarked that students inside those classrooms are more likely to feel excited about learning English than a classroom with students in non-music classrooms. Statistical analysis of the study portrays that those students in musical classrooms learn and do acquire more English. Songs can help learners overcome psychological challenges like anxiety, lack of self-confidence, and apprehension and fuel their drive to understand the target language. In terms of pedagogy, effective learning must have active engagement with the target language. English songs are valuable materials in this aspect. Songs are also understandable, entertaining, genuine, and full of vocabulary that we need in our everyday life. Songs' essential qualities make them effective instructional materials in English language classrooms. If used correctly by the teacher, English songs are a wonderfully effective way for students to develop confidence and inspiration in the target language while still learning it. (Shen 2009)

According to the National Center Safe Supporting Learning Environment, there is an impact in active engagement with music in enhancing language and speech recognition, improving communication skills, and reading skills during the developmental stages. Kuśnierek 2016, asserted that songs could be a development in language fluency. The main cognitive reason why songs must be integrated into the classroom is that it allows a person to know what to say and produce language fluently. According to Iwasaki et al.(2013), pupils remember them through repeated listening while reading written lyrics.

Iwasaki et al. (2013), who utilized songs to enhance L1 literacy skills for young students, said, “Songs have specific characteristics that make them memorable and enjoyable.” To begin with, the melody and rhythm of songs make them simple to learn and remember. Second, rhyme, assonance, and alliteration are frequently used in song lyrics (a type of poetry). This toying with the sounds of language can lead to the development of phonemic awareness.”

Guiding students through the process of identifying L2 songs and equipping them to navigate their knowledge of the lyrics autonomously is one step toward empowering them to build connections with the target culture outside of the classroom. After all, "connections-enhanced instruction" teaches students how to utilize the L2 to "explore a new world from diverse viewpoints and relate that world to their own thinking and experience" (Kern, 2008). Students have a more explicit route to explore the marvels of other worlds when they are motivated by music and given the proper tools. For example, Breakeven (The Script, 2008) uses the term break in several senses in a single line: when a heart breaks, no, it doesn't break even. 1. Break, in the literal meaning of shattered glass, is metaphorically extended to the concept that abstractions, like broken glass, are fractured and dysfunctional. 2. A shattered heart refers to the painful termination of a meaningful relationship in colloquial terms. 3. In the idiomatic financial meaning, breaking even means that neither a profit nor a loss has happened.

Eken (1996) asserted that there are eight reasons for utilizing songs in a language classroom. A song can be effectively used when presenting a new vocabulary or a language point. A song can be used as practice for knowing words in a language. Songs can be used in improving listening skills. Songs can be used by teachers to focus on the usual errors of learners in a subtle way. It is also undeniable that songs can be the best way to stimulate discussion about the students' feelings or attitudes. Songs can help the learner to share their opinions with their classmates. Furthermore, songs can be a source of a relaxing atmosphere in the classroom. Lastly, songs can encourage learners to be creative and imaginative during their foreign language class.

According to Cox (nd), quoted by Pacini 2019, said that poetry and songs are comparable to each other. In a sense that it can create relationships that can reflect personal communications directed to self-expression. Integrating musical creativity in the class can signal child-centered motions that bring specific influences on the curriculum. It is an extent to shift further the understanding of developments in line with the fundamental ideas through music.

Musical background in schools can help students attain long-term memory, utmost brain function, or an improvement in the brain. Studies exhibit that a student is more alert in class when their daily lessons are integrated with music. (Pacini 2019)

Quast (1990) discovered that music positively affects acquisition in language even in a passive fashion. In his study, background music is influential for the students to exhibit more positive attitudes. Students can significantly perform better and easily recall tasks using background music while memorizing a list of words. Suggestopedia theory was the technique he utilized in his research. In suggestopedia, it advocates the use of Baroque music above all the genres. Nevertheless, music enhances language acquisition, and there are proofs across disciplines supporting integrating music in EFL curricula.

Also, movements and music can help transfer information into the learners' long-term memories, which is an excellent method to integrate kinesthetic learning. Music also aids retention skills. Music triggers multiple parts of the brain to activate the left and right and the front and back parts of the brain. (Foxwell, 2018)

Finishing complex academic tasks while listening to music is one way to relax and reduce students' stress or anxiety. Some studies show that listening to music while doing tasks promotes cognitive performance, while other studies show that this technique can impair performance. (Dolegui, 2013)

The study of Fisher (2001) and Quast (1999) specifically insinuated the effectiveness of music in language learning, both of these researchers found that music has positive effects on language acquisition. In addition to Fisher's study, aside from beginning each day with an opening song, students in musical classrooms learn spelling words taken from songs and read stories accompanied by music. The conclusive results of this study state that using a theme to learn a language is a helpful way for EFL teachers to integrate music into their curricula.

In learning a language, there is empirical evidence that music aids in the process of learning. Students who discovered a new language with the assistance of music were able to recognize and distinguish words better than students who listened to sentences (lyrics) without music, according to Schon et al. (2008). The rhythm and intonation of the song made the learners hear prosody that is subtle and understated in speaking. In another study (Salcedo, 2010), students recall texts better when learning a language is accompanied by music.

Music produces different opportunities to teach the critical elements of language. Because tone, pitch, and rhythm are standard in music and prosody, music may reinforce prosodic traits while teaching prosody. Many students who might not understand or detect some of the oral language features with voice alone are more likely to discover it when music is added to words, according to the findings of research by Schon et al. (2008).

Shen (2009) explains how music and song should be used to stimulate effective learning. English songs in classrooms can help students learn more effectively by creating a pleasant learning environment, reducing anxiety, developing interests, and encouraging them to understand the target language. Students will view English songs as entertainment rather than work, making learning English by songs enjoyable and relaxing. In addition, songs will help people become more conscious of different languages. Songs are a great source of target language usage that can help students improve their language comprehension when studying English as a second language.

According to Millington (2011), English language teachers nowadays believe that songs and music are helpful in language learning because these are considered motivating tools. Vocabulary is one part of a foreign language that may benefit from song-based teaching and learning. When it comes to teaching words, teachers play an essential role. They guide their students in expanding and improving their vocabulary and creating their new stock of dishes to choose from. Songs allow exciting changes in the classroom, thus, stimulating learning experiences. Millington also points out that songs play a vital role in developing a second language. Pieces can be helpful to pedagogical tools. It will go into how songs will help students develop their listening abilities and grammar and teach vocabulary and sentence structures.

Statement of the Problem

This study explored the teachers' experiences in teaching English to Junior High School students using song integration.

Specifically, the study answered the following questions:

1. How did the participants integrate songs in teaching the English subject?
2. What are the participants' purpose/s in the integration of songs in their English Subject?
3. What are the participants' observations to the students when integrating songs in teaching the English Subject?

Theoretical Framework

Mozart effect is a theory that suggests rhythmic music can help students to boost their mental performance. After listening to Mozart's music for 10 minutes, several researchers reported enhancing spatial-temporal reasoning performance. (Jenkins, 2001)

According to Davies (2012), music as a medium for learning has been used over the ages. Initially, people in the old times recall or memorize stories that have been interpreted with music. At the start of periods, particularly men used to sit in front of a campfire and begin to share their great battle experiences in the form of tales while delivering it with the beats of a drum. In the Middle Ages, tribal poet-singers were the leading source of information as they sang about national heroes while wandering around the countryside.

According to School Work Helper (nd) In Music Learning Theory, Gordon examines how music is taught using the fundamental principles that music is learned mainly through “audiation” and that the process of learning music is strikingly similar to that of learning a language. Music Learning Theory is "the study and synthesis of the sequential way in which we learn when we learn music," Gordon's word for the capacity to conceive music in mind with comprehension is “audiation.” Music Learning Theory is a particular technique for teaching it. Teachers of various types can use Music Learning Theory concepts to create sequential curricular goals that fit their teaching methods and values.

According to Sokolowski (2000), studying how things present themselves to us in and through such experience and human experience is phenomenology. Smith (2008) stated that the analysis of structures of consciousness as experienced from the first-person point of view is phenomenology.

However, Finlay (2013) asserts that when social research is described as phenomenological research, the researchers desire to unfold the meaning people put on an issue, event, practice, or phenomenon. As Finlay puts it, phenomenology intends for a ‘fresh, complex, rich description of phenomena as concretely lived.

Through the aforementioned theories, the researchers explored the experiences of the teachers to test whether the theories above are being experienced by the participants.

Methodology

This chapter expounded the research design, participants of the study, instruments, data gathering procedures, data analysis, and ethical considerations.

Research Design. This study utilized qualitative research—the phenomenological type of research. Qualitative research is a method for digging into and comprehending the meaning of individuals or groups affected by a social situation. The process involves emerging questions and procedures, data typically collected in the participant’s setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. (Creswell, 2013)

Furthermore, phenomenological approaches particularly bring to light individual experiences and perceptions from their perspectives, challenging structural or normative assumptions. Adding an interpretive component to phenomenological research allows it to educate, support, or question policy and action by enabling it to be utilized as the foundation for practical theory (Lester, 1999).

Sampling Technique. The researchers used a non-probability sampling technique, specifically purposive sampling. According to Patton 2002, Purposive Sampling is one of the techniques most used in qualitative research. It is used to identify and select cases that are rich in information with the use of compelling collecting data in limited resources. Cresswell and Clark (2011) assert that it includes determining and identifying groups of individuals or individuals rich in knowledge and experience with a specific event or phenomenon.

Participants. The participants in the research were from several Junior High Schools in Pampanga. They were selected purposely: five (5) English Teachers from five Junior High Schools in Pampanga who integrate songs in their English class.

Instrument. In this study, the researchers used semi-structured interviews. The online discussion with the participants provided first-hand information capturing their experiences in integrating songs when teaching the English Subject. According to Easwaramoorthy and Zarinpoush (2006), interviews are an acceptable approach when in-depth information about people's ideas, beliefs, experiences, and feelings is required. Interviews are beneficial when the topic of investigation necessitates in-depth questioning and probing. Three (3) professionals in the field of education validated the interview guide. It was presented to professors in the school to assess the acceptability of the question as to comprehensibility, appropriateness, and clarity.

Data Gathering Procedure.

The following were the steps in gathering the needed data:

a. To validate the interview guide questions for data collection, the researchers will seek the validators' permission.

b. The researchers will create a letter of consent and letter of approval for the participants' formal interview.

c. The researchers will pick out their participants and will make sure that the participants have met the criterion that was set by the researchers.

d. After choosing the participants, the researchers will explain what the research is all about to the participants.

e. The researchers will conduct a one on one interview about the experiences of the participants in integrating songs when teaching English Subjects.

f. After that, the interview will happen, and it is a must that the researchers will record it and write down the essential points that the participants will answer.

g. The researchers can ask follow-up questions if necessary.

h. Following the interview, it is critical to express appreciation to the participant and notify them that the discussion will be kept private and anonymous.

i. Eventually, the researchers will have a consultation with the research adviser, and lastly will be the evaluation of the research.

Ethical Consideration. According to the Center of Innovation in Research and Teaching (2015), ethical consideration in research is critical. Ethics are the norms or standards for conduct that distinguish between right and wrong. One of the most important ethical considerations in research is the use of human subjects. In this study, the informed consent of the participants was entirely ensured by the researcher. The information and other data that yielded were treated in full respect and confidentially to avoid any form of harassment and subjective treatment. To further expound, the considerations were as follows:

Participant's Rights. The participant's participation was entirely voluntary, and they had the option to withdraw if they did not wish to be interviewed.

Confidentiality. The following precautions were taken to guarantee the participant's confidentiality: the participant's identity remained anonymous, and only the identified researchers had access to the study data.

Procedure Description. The participant had complete autonomy in deciding whether or not to participate in the study. The researchers expected the participants to participate in the study if they consented to participate fully. The participant, on the other hand, was required to adhere to the study's protocols. They should honestly answer the questions about the study's trustworthiness and validity.

Data Analysis. The researchers used Thematic Analysis in analyzing the data. It is one of the methods for analyzing qualitative data. Since the technique in gathering data was through interviews, thematic analysis was relevant. There are six-step processes in doing thematic analysis: Familiarization, Coding, Generating Themes, Reviewing Themes, Defining and Naming Themes, and Writing Up (Braun and Clarke, 2014)

Results and Discussions

This chapter presented the data, including their interpretation and analysis, focusing on the study's specific problems.

Participants' Ways of Integration of Songs when Teaching the English Subject.

There are many challenges that teachers face in teaching the English language, such as maintaining students' interest throughout the lessons. Teachers should think of different techniques in integrating songs in the discussion. These themes are formed using the following key points:

Theme 1. By Using Participants' Favorite Music.

Participants integrate their favorite music as a way of inspiring and motivating the students. It allows the participants to have a strong connection to their students. Moreover, it makes the student feel connected to the class. Some comments of the participants that established this theme are:

> "I picked songs that I will integrate in my class, the songs na nakaka inspire and special to me." (I picked songs that I will integrate in my class, the songs that are inspiring and special to me.) –T1

> "I usually play my favorite genre of songs like old but gold na songs for my students." (I usually play my favorite genre of songs like old but gold songs for my students.) –T2

> "I am using songs that are close to my heart kasi that's my way to be close to my students eh." (I am using songs that are close to my heart because that's my way to be close to my students.) –T5

Ross (2015) stated that music has a strong emotional impact on both children and adults. According to studies, if you want to improve brain performance, you must first improve your emotional well-being by listening to music you enjoy. Moreover the age of your students, for example, will influence the type of music you play. Soft, instructive, and suitable for all ages.

Theme 2. By Using Popular Music.

Participants integrate music that is popular as a way of catching the attention of the students. With popular music, English teachers can hook the students' interest in relating the music to the lesson to participate in the class. The following testimonies of the participants supported this theme.

> "I often find music that is popular to the students and by playing those songs, it can capture the interest of my learners." –T1

> "...sometimes I play songs of what they like, alam mo 'yon, 'yung more upbeat and popular to this generation ganyan… songs that are often played everywhere." (...sometimes I play songs of what they like, you know that, songs that are more upbeat and popular to this generation, like that… songs that are often played everywhere.) –T2

"I used songs that are well known to my students like one time, I used "What Makes You Beautiful" dahil topic namin no'n proverbs about beauty and I noticed that I grabbed their attention makikita mo talaga sa mata nila yung interest sa lesson." (I used songs that are well known to my students like one time, I used "What Makes You Beautiful" because our topic that time was proverbs about beauty and I noticed that I grabbed their attention. You can really see their interest in the lesson through their eyes.) –T4

According to Lieb (2005), interest and motivation are factors of effective teaching and learning. It is not confidential that high school and university students love popular songs. Popular songs or music yield students to learn things like English language structures, language patterns, and idioms and are the dominant source of colloquial and informal words of the English language. Popular songs make the target language and the culture of the language accessible to the students. The purpose of playing popular music is to help the student to learn and be motivated.

Theme 3. By Connecting the Topic.

Participants find different ways on how to integrate music in the English Classroom. Connecting songs in the related topic to maintain active participation is what the teachers do in their classes. The direct quotation below is drawn from the transcribed interview:

"But most of the time I play songs to connect the lyrics to my lessons for more active participants." –T1

"I integrate songs when there is a certain topic that can be discussed through songs. Also, I integrate english songs when I want to know their thoughts about a certain topic in a way that they will not be pressured." –T3

"I try to connect it to a lesson so I can encourage them to participate syempre, and be active in class…" (and I try to connect it to a lesson so I can encourage them to participate and be active in class..." –T4

"When I think that the topic is relatable to a certain song, that is usually the time when, you know... I integrate songs." (When I think that the topic is relatable to a certain song, that is usually the time when, you know... I integrate songs.) –T5

Hamilton (2020) asserts that we can use music inside the classroom to get the class started as a motivator. When the bells begin to ring, and the students are lined up to get inside the school, we can play the music that uplifts the students' mood or play music relative to the lesson. For example, we can play Beethoven's Ode to Joy as they go inside the classroom or if their next assignment is about planets, we can have music related to worlds like Star Wars theme music. Also, he concludes that most teachers or educators recommend integrating music relevant to their presentation or lesson.

Participants' Purpose/s in the Integration of Songs when Teaching the English Subject.

To set an end goal in our minds is always what we look forward to when we are doing something. Integrating songs in the English classroom is not only merely for entertainment, fun, or enjoyment. Beyond all of these, there is a passionate desire for English teachers to help their students to improve in different aspects. Considering the participants' testimonies, the following themes are formed.

Theme 1. Improvement of English Fluency.

Putting songs in the discussion is not only for the entertainment of the students. There is a beyond reason for English Teachers why they are integrating songs in their English classroom. For the English teachers, the integration of songs is one way to help the student become fluent in English. The preceding discussion is drawn from the transcribed interview:

"I integrate songs mainly because I want to make my students improve their ability in speaking fluently in english, para din sa kanila yun para di sila natutukso." (I integrate songs mainly because I want to make my students improve their ability in speaking fluently in english, it is also for them not to be mocked.) –T1

"It is not only for fun of course. I want my students to be fluent in english that's why I integrate songs." –T3

"Mga students kasi ngayon even though they are in high school already, they are still having a hard time to speak fluently in english, that is also one of the reasons ano, kaya I really use songs." (Many students today even though they are in high school already, are having a hard time to speak fluently in english, that is also what of the reasons, that is why I really use songs.) –T5

In terms of how they are learned, music and language have a lot in common. According to a recent study, students who could recognize a misplaced note in a song were more likely to acknowledge missing elements of language. When students learn even the most fundamental musical concepts like rhythm and beat, their brains practice language interpretation skills and fluency. (Seth, 2011)

Theme 2. Enhancement of Comprehension, Creativity, and CTS.

One of the goals of the English teachers who integrate songs is to enhance the students' critical thinking skills. Also, the purpose of the teachers is to improve the comprehension and creativity of the students. This theme is strengthened using the following key points:

"...and enhance their memorization syempre, and dagdag pa diyan yung critical thinking skills nila" (...and enhance their memorization of course, and in addition to this their critical thinking skills.) –T2

"Songs are poems din naman, and integrating songs can make them enhance their creativity especially… when I ask them to write a poem that is connected to the song I integrate." (Songs are also poems, and integrating songs can make them enhance their creativity especially… when I ask them to write a poem that is connected to the song I integrate.) –T3

"For me, integrating songs gives the teachers a fresh platform to tap into their students' creativity (hm) for example, pagsusulat ng poems and then one more thing the comprehension tinitignan din 'yan while teaching." (For me, integrating songs gives the teachers a fresh platform to tap into their students' creativity (hm) for example, through writing poems and then one more thing we are also looking at their comprehension while teaching.) –T4

"To impart knowledge while making students enjoy my class." –T5

According to Florida National University (2019), Music has been shown to improve cognitive performance, which is perhaps one of the most compelling reasons to engage in learning through music. Music, in general, aids brain function. Musical engagement is a type of cognitive exercise for the brain that prepares it for future challenges.

Theme 3. Boost of Students' Interest.

In a classroom setting, it is impossible to generate knowledge and learning without the students' interest. One way of making the students learn from the subject is to capture their interest. By integrating music, it is easy for the English teachers to get the attention and interest of their students, as confirmed by their comments. The following responses established the theme as mentioned earlier:

"Because it can boost the initiative of the learner to participate in the discussion and make each lesson interesting to talk about for the students." –T1

"The main goal dito is to motivate the learner to participate in the discussion, maraming magtataas ng kamay diba?" (The main goal here is to motivate the learner to participate in the discussion, many will raise their hands, right?) –T2

"I integrate songs because in this way, I can make the students listen to me." –T3

"Cooperation and teamwork should be essential here, kumbaga collaboration diba? Tsaka yung talents nila mas lumabas at yung tahimik eh mas mag improve." (Cooperation and teamwork should be essential here, in other words collaboration, also their talents can be shown more and the quiet ones will improve.) –T4

"Wala naman may gusto ng boring na klase and as english teacher we have to do something about it diba?" (No one wants a boring class and as an english teacher we have to do something about it right?) –T5

Language learning is often viewed by students as dull and tedious. Finding creative ways to capture a student's interest in language learning is one of the many challenges of English teachers. Since music has a universal appeal and impact in our daily lives, it possesses characteristics that can teach. (Bokiev et al., 2018) Peterson (2015) claims that many teachers use songs and make them a soundtrack in their classroom activities because it is deemed practical to capture the interest of their students toward the learning materials. This strategy also helps the students activate different aspects, including emotional, physical, and mental. Music creates multi-sensory interaction that makes the students to be highly focused on their learning state.

Theme 4. Retention of Knowledge.

Knowledge retention of learners is one key factor to attain critical thinking and other higher-order thinking skills. Once the students can put the information in their long-term memory, that's when the lesson becomes effective. That is also one of the reasons why English teachers integrate music into their teaching. The statements below showed how the English teachers integrate songs to enhance their students' retention skills.

"It also helps the students to easily recall the lesson that I discussed because of the music played… that's my purpose." –T1

"I, for one, use music or songs in teaching because it is also one of the easiest ways for my students to remember the lesson." –T4

"One more thing, music can helps them to remember the lesson talaga gusto ko na naretain 'yung tinuturo ko."(One more thing, music can help them to remember the lesson and I want what I teach to retain.) –T5

Knowledge retention plays a vital role in the education process of a learner. White (2007) reports that music helps improve students' grades and performance inside the classroom, but above all, it aids their knowledge retention. He also asserted from Lewis (2002) that there is higher retention of learning materials whenever music is being played in the students' learning experience.

Participants' Observations to the Students when Integrating Songs in Teaching the English Subject. Through observation, one can determine whether the result of an action resulted positively or negatively. The fulfilling part in teaching is when the integration of songs has a positive effect on the students. The objective of the teachers does not only end with setting a goal when integrating songs. An essential part lies in their observation. Considering the participants' response, the following themes were created.

Theme 1. Passive to Active.

Students are frequently passive in the classroom for various reasons, including a lack of interest in the presented subject matter. Incorporating songs in class is one method to engage students and make them active participants. The participants shared the same view as transcribed from their interview:

> "It improved yung overall moods nila to study harder, nagiging active sila when they hear the songs or beats and mangyayari...more or magiging productive yung discussion namin." (It improved their overall moods to study harder, they get active when they hear the songs or beats and what will happen… more or our discussion will get productive.) –T1

> "Mabibigla ka nalang yung mga dating hindi nag raraise ng hands yun yung mga nakataas and It boosts their confidence to answer kasi they are entertained and learning." (You will be surprised that the ones that do not raise their hands are the ones who are raising theirs now, and it boosts their confidence to answer because they are entertained and learning.) –T2

> "Because of using music, napansin ko that most of my students do better in class kumapara nung uhm… when I don't integrate it to them, they often get bored and do other things, like talking to their seatmate, nagdadaldal na sila or minsan naman some of them natutulog lang." (Because of using music, I notice that most of my students do better in class compared when uhm… when I don't integrate it to them, they often get bored and do other things, like talking to their seatmate, they get talkative or sometimes some of them will be sleeping." –T3

> "Nag eenjoy sila sa activity and they are usually active rather than passive." (They are enjoying the activity and they are usually active rather than passive.) –T4

> "Before kasi konti lang yung mga active sa mga students ko, hm kaka-unti lang mga nagpa-participate when it comes to recitation at activities.. When I started integrating songs, nadagdagan 'yung mga students na nagpa-participate." (Before, I did not have many active students, hm there were only a few who were participating when it comes to recitation and activities.. When I started integrating songs, the number of students who were participating increased.) –T5

Using songs in English class helps students' comprehension and increases their interest to learn, enjoy and engage in the learning process. By providing a more comfortable and good learning environment, songs have a great impact on the learners' self-confidence and academic achievement. Songs can also help learners stay motivated and build a passion for language study. This motivation encourages students to be innovative, creative, and eager to learn and be successful. (Bokiev, Bokiev & Lilliati, 2018)

Theme 2. Improvement of Social Skills.

Social skills should also be instilled in students. Students are prepared for social life through socialization, which teaches them the expected norms, values, beliefs, and peers' actions. The use of songs in the classroom improves students' social skills and prepares them for life. The importance of the theme, as mentioned earlier, is magnified by the responses of the participants stated below.

> "Makikita mo mga yan talking to their classmates more ang pinaguusapan yung lesson, and I even heard one of them say "I got LSS ba yun?" oo last song syndrome pala yun." (You can see them talking to their classmates more and they are talking about the lesson, and I even heard one of them say I got... LSS" is that right? Yes, the last song syndrome is what they call it.) –T1

> "Integrating songs enhances their social skills too kasi the learners join their classmates in singing at the same time nakikipag interact sila with their classmates in doing actions while singing." (Integrating songs enhances their social skills too because the learners join their classmates in

singing at the same time they are interacting with their classmates in doing actions while singing.) –T2

"Integrating songs is a really great way to improve the social skills eh especially your students because they then have an idea about the songs and they can share it sa friends at classmates nila." (Integrating songs is a really great way to improve the social skills especially to your students because they then have an idea about the songs and they can share it to their friends and classmates.) –T3

"Napansin ko din na it boosts their confidence, nakakapag socialize with their classmates, then yung introversion nila nawawala alam mo yun?" (I noticed also that it boosts their confidence, they socialize with their classmates, then their introversion fades, you know what I mean?) –T4

"Doon naman sa ano, socialization skills.. hmm like what I have said earlier since naging participative sila sa class, naging interactive na rin sila with their classmates they were able to enjoy my activities with them." (To their..., socialization skills… hmm like what I have said earlier since they are being participative in class, they get interactive with their classmates, they were able to enjoy my activities with them.) –T5

According to the National Center Safe Supporting Learning Environment, being exposed to music can help students study better and create a more happy school environment. Active participation affects how the brain processes information and improves the learner's ability to interact with others.

Theme 3. Improvement of Grades and Memory.

Music reactivates memory, logic, speech, and reward regions of the brain when it is played or listened to. Music aids in not only the retrieval of old memories but also the creation of new ones. The sharing of the participants highlighted this theme.

"Pansin ko mas madali para sakanila magmemorize kasi they enjoy singing instead of just memorising the lesson eh. Kapag they're in a test, naririnig ko pa sila kumakanta at binubulong yung kanta, and I can't help but smile." (I notice that it is easy for them to memorize because they enjoy singing instead of just memorising the lesson. If they are in a test, I hear them singing and murmuring the song, and I can not help but smile.) –T1

"Integrating songs enhances their memorization skills yun, kasi siguro sa repetitive words and lyrics." (Integrating songs enhances their memorization skills, probably because of the repetitive words and lyrics.) –T2

"Sometimes when I enter my class dinig ko kinakanta padin nila yung song na tinuro ko before. It just brings a warm welcome for me everyday na papasukan ko sila." (Sometimes when I enter my class, I hear them singing the song that I taught before. It just brings a warm welcome for me everytime I go and enter our classroom.) –T3

"Nagulat nga ako to be honest, kasi they were able to memorize the lesson easily." (To be honest I was surprised, because they were able to memorize the lesson easily.) –T4

“In terms of their memorization skills, hmmm I have noticed na nag-improve yung memorization nila kasi they were able to recall the lessons that I have discussed.” (In terms of their memorization skills, hmmm I have noticed that they are improving in memorization because they were able to recall the lessons that I have discussed.) -T5

According to White (2007), some current studies suggest that integrating music in the classroom may help to improve students' academic performance and create a positive effect on their cognitive development. In addition, a song is a tool that also allows students to be productive, motivated to learn, and lead them to have positive behavior.

Conclusion and Recommendations

Summary of Findings

Based on a thorough analysis of the collected data, the significant findings of this study are as follows:

1. Participants' Ways of Integration of Songs when Teaching the English Subject

2. Participants integrate songs by using participants' favorite music, by using popular music, and/or by connecting the music to their topic to maintain the students' interest throughout the lessons. Furthermore, songs serve as an inspiration and motivation to the students in the lesson.

3. Participants' Purpose/s in the Integration of Songs when Teaching the English Subject

4. Integrating songs in the English subject are for entertainment and for the improvement of students' fluency in the English language. Also, the participants' purpose of integration is to improve students' comprehension, creativity, and critical thinking skills. Furthermore, to boost their interest in the subject and to enhance their knowledge retention are also included in their purposes.

5. Participants' Observations to the Students when Integrating Songs in Teaching the English Subject

6. Through integration of songs, the participants observed that students are more active than passive in the discussion. Incorporating songs in class is one method to engage students and make them active participants. The participants also observed that students improve their social skills, grades and memory.

Conclusion

Based on the findings of the study, the following conclusions were made:

a. The participants of this study have different ways and strategies in integrating songs in their students when teaching the English Subject.
b. The participants set multiple purposes for their students when they integrate songs in teaching the English Subject.
c. The participants observed the active participation of students, improvement of social skills, grades, and memory.

Recommendations

a. Knowing the teachers' observation of using music in teaching the English subject, teachers may develop a playlist or list of songs as a possible output and connect it to their topic that they can use in their discussion.
b. Upon knowing the purposes of the participants, students' english proficiency can also be added to the participants' purposes when integrating songs in the English Subject.
c. Teachers who integrate songs in their English subjects can evaluate the students to test the effectiveness of the teaching pedagogy used by the teachers.
d. Further study on this topic that will be focused on the students' experiences when their teachers integrate songs in the class is highly recommended.

Acknowledgement

The researchers would like to extend their sincerest gratitude to the following for without them, this study will not be a success:

Above all, to God Almighty, for His eternal blessings throughout the research work. He makes things possible for us to finish the study successfully amidst the pandemic;

To Dr. Riza B. Lintag, Dean of the College of Education, and Dr. Mildred M. Crisostomo, Research Instructor, for their guidance and compassion as the researchers gradually completed this study;

To Ms. Joyce Arrozal, Mr. Mark Jayson Bautista, and Ms. Kathleya Vianca Habon, members of the Panel, for their valuable critiques and helpful recommendations for the improvement of this study;

To the participants of the study, for the cooperation and information that they have shared. Their participation is highly appreciated;

To Mrs. Joyce Ann M. Tolentino, the research adviser, for the invaluable guidance and continuous support for the betterment of this study. Her virtue and motivation have deeply inspired the researchers. It is a great honor and privilege to work and study under her guidance; and

Finally, to the researchers' families for the unconditional love, prayers, financial support, and moral support throughout their educational journey. They are the researchers' inspiration to accomplish this study

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Assessment on the 21st Century Pedagogy of the Board Courses at Taguig City University: Basis for Faculty Training Program

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Abstract - Today's expectation in colleges or universities has been increasing, it becomes critical for institutions of higher education to engaged learning that prepares students for life and the ever-changing world of work is. It is the duty of the institutions of higher education to assess its own performance. Higher education institution adapts to the trend, Outcome-Based Education has become a means of meeting the trend's requirements. The P21 framework prompted the researchers to ascertain the instructors' level of 21st-century skills, specifically in the board course programs offered by Taguig City University. Using a Quantitative-Survey Research framework to ascertain the degree to which teachers are using 21st century skills in the classroom based on their responses to the survey instrument. It will evaluate the 4Cs, or Critical Thinking, Collaboration, Communication, Creativity, and Innovation skills, as well as the Life skills, or Self-Direction, Local Connection, Global Connection, and Use of Technology as a Tool for Learning, which has a specific indicator of the said 21st century standards. As a result, the researchers conclude that the Communication Skills, Self-Direction Skills, Local Connection Skills, and Global Connection skills should have a significant focus on the faculty members' pedagogical skills. Stated indicators on these standards should be practiced more often on their pedagogy. Because the teachers are the factors that underpin success in building the 21st century skills of students. Therefore, they can also contribute to the students' weakness if they are not well-equipped with the 21st century skills. In addition, they also play the key role in keeping up with the progress of education development which requires them to understand and be willing to make changes in teaching and learning to suit the 21st century learning. Thus, their 21st century pedagogy practices were seen as an effort that should be taken seriously.

Keywords - 21st Century Pedagogy, 4C's (Critical Thinking, Collaboration, Communication, Creativity), Life Skills (Self-Direction, Global Connection, Use of Technology as a Tool for Learning) Information's Communication Technology (ICT)

Introduction

The quality of education is one of the main concerns today. Education is preparing students to face a better future, be independent, and face different challenges. Educational systems worldwide are searching for best practices to prepare students in school to deal with life and work increasingly complex in accordance with the needs of the 21st- century. Education in the 21st -century is significantly affected by the changes that have taken place in society, globalization, technology, immigration, and others. In the 21st century skills, the teachers not only need to guarantee that their academic achievement is improving but at the same time, they are creating a workforce and a holistic personality to meet the newest economic challenges.

Every institution strives to meet the educational objectives or anticipated learning outcomes set forth by the system. The success of the institution is determined by the type of faculty it employs and how well its' members perform their duties. The excellence of the education system is clearly determined by the quality of the teachers who manage it. This statement shows that teachers perform an important role in any educational program's success, including influencing student learning at a higher level. Teachers are also essential to economic success and education for sustainable development based on 21st-century skills. It is the school's and the teachers' obligation to prepare all children for the educational demands of life and work in a fast-changing world by providing the students with the required skills. However, teachers face many challenges in developing the 21st century skilled.

Teachers should be specifically trained in educating students 21st-century skills, as the primary focus of education has changed. Utilizing 21st-century pedagogy means ensuring that students can learn, practice, and apply skills that are relevant in today's modern world. To maintain the standard of 21st-century pedagogy, educators should go beyond the current educational needs. Every teacher should be able to incorporate information and communication technology into their classrooms, and the learning process is a central feature of this. Furthermore, teachers are expected to provide such skills to their students, and teacher preparation programs should provide multiple opportunities for teachers to learn, develop, and practice these 21st-century skills. Therefore, it is essential to identify and promote the most effective practices, such as practices that effectively help students achieve desired learning outcomes. In the same way, developing teaching strategies is equally important in determining the students' quality of learning.

The study's goal is to determine the 21st-century pedagogical skills of the faculty members at Taguig City University's board courses. The study will focus on the professional development and will serve as the foundation for a faculty training program. As a natural result, the product for this generation would be excellent.

Methodology

The study used the Quantitative-Survey Research method to determine the extent of which 21st century skills being use by the faculty members inside the classroom through the result of the survey instrument they have answered. This includes the collection of data to test the hypothesis and answer what is being ask in the instrument. There two set of respondents of this study, the faculty members of the board courses at Taguig City University and third-year students of the board courses enrolled in the academic year 2020-2021. The study involved thirty seven (37) faculty members at Taguig City University and two hundred fifty (250) 3rd year student' of the board courses in school year 2020-2021 who participated to answer the survey instrument. The respondents agreed to respond the research survey instrument for them to assess the faculty members' 21st century pedagogy. When the researchers have the survey tool and securing permission for its use to the study, the researchers began the formal process for the approval of research study. The letter to conduct survey was sent to the Deans of all Board Courses and to the registrar to gather the number of its instructors/professors and the 3rd year students of the board courses programs.

Once all the approval and permissions were received, the researchers requested the names and email address of the students and faculty members who had been identified as participants of the study. However, due to the pandemic the researchers did not receive the names and email address of the faculty members and the 3rd year students of the board courses program

The researchers prepared the survey instrument for electronic distributions. The survey was prepared and tested to ensure that responses would be gathered accurately. To increase the responds rates the researchers seek help from friends of friends to resend the survey instrument to the participants. The researchers followed up with the participants many times and thanking those who have already answered the survey and encouraging those who still not answering the survey instrument. Same process was done on sending the survey instrument to the faculty members.

During the process of tabulating the data, the survey data were analyzed using both Microsoft Excel and SPSS application in performing the hypothesis of the study. Survey instrument was used in collecting data for this research study in relation to 21st century skills pedagogy of the Taguig City University. The center of this study was on experience and perceptions related to 21st century skills of the faculty members.

The study adapted a questionnaire (A Survey for Measuring 21st Century Teaching and Learning: West Virginia 21st century and Learning Survey [WVDE-CIS-28]) developed by Dr. Jason Ravitz. The researcher sought permission from the developer of the survey questionnaire to use the instrument in the study. The researcher made minor wording adjustments in the survey instruments so that students and faculty could easily catch up what they were ratings.

Results and Discussions

Level of Critical Thinking Skills of the Faculty Members as Assessed by the Respondents

Critical thinking Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. compare information from different sources before completing a task or assignment	3.20	FP	3.30	FP	3.43	HP	3.29	FP	3.22	FP	3.29	FP
2. draw our own conclusions based on analysis of numbers, facts, or relevant information	3.40	FP	3.21	FP	3.57	HP	3.30	FP	3.28	FP	3.19	FP
3. summarize or create our own interpretation of what we have read or been taught	3.40	FP	3.33	FP	3.57	HP	3.47	FP	3.28	FP	3.34	FP
4. analyze competing arguments, perspectives or solutions to a problem	3.40	FP	3.15	FP	3.71	HP	3.21	FP	3.33	FP	3.24	FP
5. develop a persuasive argument based on supporting evidence or reasoning	3.60	HP	3.15	FP	3.36	FP	3.22	FP	3.22	FP	3.24	FP
6. try to solve complex problems or answer questions that have no single correct solution or answer	3.40	FP	2.70	RP	3.36	FP	2.92	FP	3.06	FP	3.03	FP
Overall Weighted Mean	**3.40**	**FP**	**3.14**	**FP**	**3.50**	**HP**	**3.23**	**FP**	**3.23**	**FP**	**3.22**	**FP**

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice*; **FP**- *Frequently Practice*; **RP**- *Rarely Practice*; **NP**- *Not Practice*

The table displays the faculty members' critical thinking abilities as perceived by the students. As the faculty member rated themselves on the six indicators with a weighted mean of 3.36, this translates to critical thinking skills frequently practice. Furthermore, as the student rated the faculty members on the six indicators of critical thinking skills, 3.25 is the weighted mean that interprets as frequently practice. It demonstrates that the instructors have frequently practiced critical thinking skills.

The indicator "solve complex problems or answer questions with no single correct answer" had the lowest weighted mean in the results. Although this is perceived by the students as frequently practiced on their pedagogical skills; based on the numerical results of data, it clearly showed a lower scale. Accordingly, Caliskan, Selcuk, & Erol, (2018) states that, problem solving skills are also essential in teaching and learning at higher education in formulating new answers to build solutions, in which each step is the precursor to the next step and the outcome of the previous steps.

The Level of Collaboration Skills of the Faculty Members as Assessed by the Students

Collaboration Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. work in pairs or small groups to complete a task together	4.00	HP	3.42	FP	3.50	HP	3.59	HP	3.39	FP	3.47	FP
2. work with other students to set goals and create a plan for the team	3.80	HP	3.42	FP	3.50	HP	3.53	HP	3.33	FP	3.50	HP
3. create a joint-products using contributions from each student	4.00	HP	3.27	FP	3.50	HP	3.34	FP	3.44	FP	3.36	FP
4. present a group work to the class, teacher or others	4.00	HP	3.58	HP	3.71	HP	3.58	HP	3.44	FP	3.44	FP
5. work as a team to incorporate feedback on group tasks or products	4.00	HP	3.45	FP	3.64	HP	3.46	FP	3.39	FP	3.44	FP
6. give feedback to peers or assess other students' work	3.40	FP	3.18	FP	3.50	HP	3.24	FP	3.39	FP	3.22	FP
Overall Weighted Mean	**3.87**	**HP**	**3.39**	**FP**	**3.56**	**HP**	**3.46**	**FP**	**3.40**	**FP**	**3.40**	**FP**

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice*; **FP**- *Frequently Practice*; **RP**- *Rarely Practice*; **NP**- *Not Practice*

The table displays the level of collaboration skills of the faculty member as assessed by the students. As a result, the weighted mean is 3.53, as the faculty member rated themselves. Consequently, as the student rated the faculty members, on the six indicators of collaboration skills, 3.43 is the weighted mean that interprets as frequently practice. The researchers had to do some small calculation to get the mean of the two findings because of the disparity in the results. This is translated as frequently practice by adding the weighted mean of the two variables and then dividing it by two, yielding 3.47 that means, collaboration skills are frequently practiced by the instructors.

As a result, according to the World Economic Forum (2016), the opportunity to collaborate encourages students to practice working in groups. When students work together with classmates or peers to achieve common goals, their leadership skills strengthen, and so does their ability to maintain a harmonious relationship. Whereas the indicator "give feedback to peers or assess other students' work" indicates that instructors use it frequently in their teaching pedagogy. Students' evaluations on the faculty members, on the other hand, do not support the same weighted mean result. Students need more expertise, as well the ability to interact, connect, and solve problems. Assessing own learning and or other students' work needs attention to the instructors' pedagogy. Particularly, it allows improved collaboration, embraces all-access learning, provides different options for learning pace and even content to make activities more exciting and manageable for students. (Breed, 2020)

The Level of Communication Skills of the Faculty Members as Assessed by the Students

Communication Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. construct data for use in written products or oral presentations (e.g., creating charts, tables or graphs)	3.60	HP	3.06	FP	3.71	HP	3.25	FP	3.22	FP	3.10	FP
2. convey ideas using media other than a written paper (e.g., posters, video, blogs, etc.)	3.80	HP	3.15	FP	3.36	FP	3.27	FP	3.44	FP	3.17	FP
3. prepare and deliver an oral presentation to the teacher or others	4.00	HP	3.39	FP	3.64	HP	3.35	FP	3.39	FP	3.31	FP
4. answer a question in front of an audience	4.00	HP	3.09	FP	3.50	HP	3.23	FP	3.28	FP	3.16	FP
5. decide how we will present our work or demonstrate our learning	4.00	HP	3.24	FP	3.50	HP	3.39	FP	3.33	FP	3.27	FP
6. effectively assess our communication skills	3.60	HP	3.18	FP	3.29	FP	3.37	FP	3.11	FP	3.26	FP
Overall Weighted Mean	**3.83**	**HP**	**3.19**	**FP**	**3.50**	**HP**	**3.31**	**FP**	**3.30**	**FP**	**3.21**	**FP**

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice;* **FP**- *Frequently Practice;* **RP**- *Rarely Practice;* **NP**- *Not Practice*

Table demonstrates the faculty members' level communication skills as assessed by the students. The instructor's weighted mean score on the six indicators was 3.45, indicating that communication skills are frequently practiced. Furthermore, the weighted mean as the student assessed the instructors has a weighted mean of 3.25 on the six indicators of communication skills, which equates in frequently practiced. It shows that the faculty members have had plenty of opportunities to hone their communication skills.

Consequently, the faculty members have heavily emphasized the indicator "prepare and deliver an oral presentation to the teacher or others." As a result, students will have access to more networking tools than they do today (NPDL, 2017) and will be able to use almost every mode of communication to some degree, as they already have global networks and resources. Students will have access to a variety of tools, including immersive tutorials and online courses, to practice using and displaying their communication skills through a variety of formats and devices (NPDL, 2017).

On the other hand, they must also have the requisite skills to be capable of, as well as understand what it means to be a responsible and ethical communicator and there are a variety of approaches, strategies, tools, and networks they can use to engage with the audience to help them accomplish that (2018, Cobo).

The Level of Creativity and Innovation Skills of the Faculty Member as Assessed by the Students

Creativity and Innovation Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. use idea, creation techniques, such as brainstorming or concept mapping	3.60	HP	3.27	FP	3.50	HP	3.45	FP	3.33	FP	3.49	FP
2. generate our own ideas about how to confront a problem or question	3.80	HP	3.21	FP	3.64	HP	3.39	FP	3.28	FP	3.38	FP
3. test out different ideas and work to improve them	3.60	HP	3.21	FP	3.50	HP	3.41	FP	3.17	FP	3.36	FP
4. invent a solution to a complex, open-ended question or problem	3.60	HP	3.09	FP	3.29	FP	3.13	FP	3.28	FP	3.26	FP
5. create an original product or performance to express ideas	3.40	FP	3.00	FP	3.36	FP	3.15	FP	3.17	FP	3.26	FP
6. assess our creativity and innovation skills effectively	3.60	HP	3.03	FP	3.14	FP	3.31	FP	3.33	FP	3.30	FP
Overall Weighted Mean	**3.60**	**HP**	**3.14**	**FP**	**3.40**	**FP**	**3.31**	**FP**	**3.26**	**FP**	**3.34**	**FP**

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice;* **FP**- *Frequently Practice;* **RP**- *Rarely Practice;* **NP**- *Not Practice*

The table displays the faculty members' level of creativity and innovation skills as assessed by the students. As the faculty rated themselves on the six indicators with a weighted mean of 3.36, this translates to creativity and innovation skills as frequently practiced. In addition, as the student rated the faculty members on the six indicators of communication skills, 3.30 is the weighted mean that interprets as frequently practice too. It shows that the faculty members have frequently practiced creativity and innovation skills.

All the indicators of the creativity and innovation skills has been frequently practiced by the faculty members, and at the same it is assessed as frequently practiced by the students. This supports the claim made by Caliskan, Selcuk, and Erol (2018) that an immense amount of available knowledge and critical analysis on developing projects and inventing solutions to problems enhances a student's capacity to be creative in terms of focusing on the problems faced.

While recent research suggests that a significant proportion of secondary and university students lack the ability to access and select suitable online tools, this was never deemed a hindrance by the institutions' faculty members, as it was perceived as frequently practiced by the students.

The Level of Self-Direction Skills of the Faculty Member as Assessed by the Students

Self-Direction Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. practice initiative when confronted with a difficult problem or question	3.60	HP	2.97	FP	3.50	HP	3.19	FP	3.44	FP	3.33	FP
2. choose our own topics of learning or questions to pursue	3.60	HP	2.91	FP	3.50	HP	3.20	FP	3.11	FP	3.20	FP
3. plan the steps we take to accomplish a complex task	3.40	FP	3.18	FP	3.36	FP	3.39	FP	3.33	FP	3.38	FP
4. choose for ourselves what examples to study or resources to use	3.60	HP	3.15	FP	3.57	HP	3.28	FP	3.22	FP	3.32	FP
5. monitor our own progress towards completion of a complex task and modify our work accordingly	3.60	HP	3.09	FP	3.50	HP	3.21	FP	3.33	FP	3.31	FP
6. use specific criteria to assess the quality of our work before it is completed	3.60	HP	3.18	FP	3.43	FP	3.26	FP	3.28	FP	3.32	FP
Overall Weighted Mean	**3.57**	HP	**3.08**	FP	**3.48**	FP	**3.26**	FP	**3.29**	FP	**3.31**	FP

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice;* **FP**- *Frequently Practice;* **RP**- *Rarely Practice;* **NP**- *Not Practice*

The table displays the faculty members' level of self-direction skills as assessed by the students. As the faculty rated themselves on the six indicators with a weighted mean of 3.40, which interprets to self-direction skills as frequently practice. Furthermore, as the student rated the faculty members on the six indicators of communication skills, 3.25 is the weighted mean that interprets as frequently practice too. It confirms that the faculty members have frequently practiced creativity and innovation skills.

Jamilah Sulaiman, Siti Noor Ismail, (2020) asserts that teacher instruction should be student-centered and incorporate information and communication (ICT) to help students learn 21st-century skills. These proves that the indicators of self-direction skills that have been applied to the teaching pedagogy of the instructors will eventually result in encompassing a wider range of abilities than digital skills. Technical skills, knowledge processing, communication, teamwork, innovation, critical thinking, and problem solving are all examples, as are ethical awareness skills, cultural awareness, adaptability, self-direction, and lifelong learning.

Nevertheless, the CHED Memorandum 46, s. 2012, the Commission on Higher Education (CHED) demands that all higher education institutions (HEIs) embrace Outcomes-Based Education (OBE), which leads to the student-centered approach of teaching which aligns with 21st century skills, as demonstrated by instructors' pedagogical means in the classroom, resulting in perfect indicators of self-direction skills adoption.

The Level of Global Connection Skills of the Faculty Member as Assessed by the Students

Global Connection Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. study information about other countries or cultures	3.40	FP	3.15	FP	3.36	FP	3.13	FP	3.28	FP	3.09	FP
2. use information or ideas that come from people in other countries of cultures	3.60	HP	3.30	FP	3.57	HP	3.13	FP	3.17	FP	3.13	FP
3. discuss issues related to global interdependency (for example, global environment trends, global market economy)	3.40	FP	3.24	FP	3.29	FP	3.06	FP	3.06	FP	3.21	FP
4. understand the life experiences of people in cultures besides our own	3.60	HP	3.27	FP	3.57	HP	3.25	FP	3.17	FP	3.26	FP
5. study the geography of distant countries	3.00	FP	2.79	HP	3.07	FP	2.88	FP	3.11	FP	2.99	FP
6. reflect on how our own experiences and local issues are connected to global issues	3.60	HP	3.24	FP	3.36	FP	3.15	FP	3.11	FP	3.16	FP
Overall Weighted Mean	**3.43**	**FP**	**3.17**	**FP**	**3.37**	**FP**	**3.10**	**FP**	**3.15**	**FP**	**3.14**	**FP**

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice*; **FP**- *Frequently Practice*; **RP**- *Rarely Practice*; **NP**- *Not Practice*

The table displays the faculty members' level of global connection skills as assessed by the students. As the faculty members rated themselves on the six indicators with a weighted mean of 3.27, this interprets to global connection skills as frequently practice. Furthermore, as the student rated the faculty on the six indicators of global connection skills, 3.14 is the weighted mean that interprets as frequently practice. It demonstrates that the faculty members have frequently practice global connection skills.

The indicator "study the geography of distant countries" was discovered to be one of the least commonly used pedagogical strategies. As a result, Savin-Baden (2014) argues that it is about comprehending and acting upon issues and perceptions from diverse societies, geographies, and global realms. Frequently regarded as the most challenging skills for students to learn, global connection skills enable students to explore and interpret a variety of data types that are deeply ingrained in culture: norms, values, beliefs, ideologies, and assumptions about the world and the way it works. (Wilcox D., Liu J. C., Thall, J., & Howley T., 2017) Particularly, Lindsay, (2017) asserts that to act on issues of local and global significance, frame understanding of the world through connected experiences that go beyond the typical textbook approach and the limitations of face-to-face or local interactions, turn intercultural differences into intercultural understandings by breaking down categories and challenging attitudes of cultural superiority and socioeconomic dominance. Thus, it is empirical that the faculty members should enhance their pedagogical skills concerning the indicators of global connection.

The Level of Local Connection Skills of the Faculty Member as Assessed by the Students

Local Connection Skills	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. investigate topics or issues that are relevant to our family or community	3.40	FP	3.42	FP	3.29	FP	3.24	FP	3.22	FP	3.29	FP
2. apply what we are learning to local situations, issues or problems	3.60	HP	3.33	FP	3.57	HP	3.25	FP	3.28	FP	3.37	FP
3. talk to one or more members of the community about a class project or activity	3.40	FP	3.06	FP	3.14	FP	3.08	FP	3.28	FP	3.13	FP
4. analyze how different stakeholder groups or community members view an issue	3.60	HP	3.06	FP	3.14	FP	2.99	FP	3.28	FP	3.08	FP
5. respond to a question or task in a way that weighs the concerns of different community members or groups	3.00	FP	3.06	FP	3.43	FP	2.97	FP	3.28	FP	3.17	FP
6. assess our own skills in making local connections effectively	3.60	HP	2.97	FP	3.50	HP	3.07	FP	3.33	FP	3.24	FP
Overall Weighted Mean	**3.43**	**FP**	**3.15**	**FP**	**3.35**	**FP**	**3.10**	**FP**	**3.28**	**FP**	**3.21**	**FP**

Legend: **VI**-*Verbal Interpretation; 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice*; **FP**- *Frequently Practice*; **RP**- *Rarely Practice*; **NP**- *Not Practice*

The table displays the faculty members' level of local connection skills as assessed by the students. As the instructor rated themselves on the six indicators with a weighted mean of 3.34, this translates to local connection skills as frequently practice. Furthermore, as the student rated the faculty members on the six indicators of local connection skills, 3.18 is the weighted mean that translates as frequently practiced. It determines that the faculty members have frequently practice in their pedagogical skills all the indicators of local connection skills.

Thus, the faculty members believe that students must develop strong local connections in order to develop a clear cultural identity and participate actively in their communities. Wilcox, D., Liu, J. C., Thall, J., and Howley, T., 2017) Given the increased focus on local community participation and related online channels, it follows that integrating discourse and debate into online social networks increases community engagement. As there is an emphasis on the value of local community engagement and corresponding online channels for promoting and facilitating community involvement, this aligns with Ognyanova's (2013) study, as cited by Wilcox D., Liu J. C., Thall, J., and Howley T., (2017) in their study, that being able to connect with the local community, apply their knowledge to solve local issues, and analyze variations shows that they acquire such local connection skills.

The Faculty Members Level of Using Technology as a Tool for Learning of as Assessed by the Students

Use of Technology as Tool for Learning	College of Arts and Sciences				College of Education				College of Criminal Justice			
	Faculty		Student		Faculty		Student		Faculty		Student	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. use technology or the internet for self-instruction (e.g., Khan academy or other videos, tutorials, self-instructional websites, etc.)?	3.80	HP	3.45	FP	3.57	HP	3.55	HP	3.39	FP	3.26	FP
2. select appropriate technology tools or resources for completing a task	3.40	FP	3.45	FP	3.50	HP	3.52	HP	3.33	FP	3.32	FP
3. evaluate the credibility and relevance of online resources	3.60	HP	3.39	FP	3.36	FP	3.40	FP	3.33	FP	3.33	FP
4. use technology to analyze information (e.g., databases, spreadsheets, graphic programs, etc.)	3.60	HP	3.27	FP	3.50	HP	3.44	FP	3.39	FP	3.24	FP
5. use technology to help us share information (e.g., multi-media presentations using sound or video, presentation software, blogs, podcasts, etc.	3.80	HP	3.52	HP	3.43	FP	3.61	HP	3.50	HP	3.34	FP
6. use technology to support team work collaboration (e.g., shared work spaces, email exchanges, giving and receiving feedback, etc.	3.60	HP	3.55	HP	3.57	HP	3.53	HP	3.67	HP	3.34	FP
Overall Weighted Mean	**3.63**	**HP**	**3.44**	**FP**	**3.49**	FP	**3.51**	HP	**3.44**	FP	**3.30**	FP

Legend: **VI**-*Verbal Interpretation: 3.50-4.00=HP; 2.50-3.49=FP; 1.50-2.49=RP; 1.00 1.49=NP*
HP-*Highly Practice*; **FP**- *Frequently Practice*; **RP**- *Rarely Practice*; **NP**- *Not Practice*

The table displays the faculty members' level of using technology as a tool for learning as assessed by the student. As the faculty members rated themselves on the six indicators, it gained a weighted mean of 3.47, which shows that the level of using technology as a tool for learning is frequently practiced. Moreover, as the student rated the instructors on the six indicators of level of using technology as a tool for learning, 3.18 is the weighted mean, which is also interpreted as frequently practiced. It proves that the instructors have frequently practiced the level of using technology as a tool for learning.

The study's findings back up Andrade's (2016) claim that using ICT-integrated pedagogy improved students' 21st-century skills. There are numerous advantages to integrating technology into the classroom. As a result, according to Goodwin (2019), improvements in pedagogical practices are needed to keep up with pervasive digital technologies and changing times. As a result of these revelations, pedagogical strategies for teaching and learning must evolve in parallel with digitization, as technology has proved to be equally effective and ubiquitous in all aspects of our lives around the world. (Sikhakhane, Munyaradzi; Govender, Samantha; Maphalala, Mncedisi Christian, 2020).

Difference on the Assessment of Faculty and Student Respondents in the 21st-Century Pedagogical Skills

21st Century Skills	t-value	Sig.	Decision	Remarks
A. Critical thinking Skills	2.359	**.065**	Accept H_o	Not Significant
B. Collaboration Skills	1.973	**.106**	Accept H_o	Not Significant
C. Communication Skills	3.599	**.016**	Reject H_o	Significant
D. Creativity and Innovation Skills	1.906	**.115**	Accept H_o	Not Significant
E. Self-Direction Skills	4.160	**.009**	Reject H_o	Significant
F. Global Connection Skills	6.394	**.001**	Reject H_o	Significant
G. Local Connection Skills	3.414	**.019**	Reject H_o	Significant
H. Use of Technology as a tool for Learning	2.171	**.082**	Accept H_o	Not Significant
Decision Rule: **sig-value $\leq$ 0.05: reject H_o** **sig-value $\geq$ 0.05: accept H_o**				

Table 19 shows the significant difference between the faculty members' level of 21st century pedagogy skills. The data shows that "Critical thinking skills has a significant value of 0.065," "Collaboration skills has a significant value of 0.106," Creativity and Innovation Skills has a significant value of 0.115, "Global Connection skills" has a significant value of 0.0906, and "Use of Technology as a tool for Learning" has significant value of 0.82, all of which are greater than the level of significance which is 0.05. It demonstrates that there is no statistically significant difference in faculty members' and students' responses to the specified 21st century skills standards. Additionally, it demonstrates that both the student and faculty members has perceived to be performing the afore-mentioned skills of the 21st century standards.

While, "Communication Skills" has a significant value of 0.16, "Self-Direction Skills" has a significant value of 0.009, “Global Connection Skills” has a significant value of 0.001 and "Local Connection Skills" has a significant value of 0.019, which were all lesser than the level of significance 0.05. It demonstrates that the specified criteria were determined to be statistically significant.

As it can be seen from the results in the mean of the indicators in the stated standards of 21st century skills. Particularly in communication skills, an indicator “prepare and deliver an oral presentation to the teacher or others” has been found to have statistically significant. The average mean for faculty members was 3.57, with highly practiced verbal interpretation while, the students' average mean on this indicator is 3.34 with verbal interpretation of frequently practice. It clearly shows that there is a significant difference. Additionally, other indicators in the communication skills had been found to have almost equal results of average mean in the data. Precisely, the rest of the indicators has been perceived both by the students and faculty members as frequently practiced.

Moreover, the self-direction skills standards have also been found to have statistically significant difference between the students and faculty members perception. In this indicator “take initiative when confronted with a difficult problem or question” has an average mean of 3.49 for the faculty members, and 3.22 for the students, both was interpreted as frequently practiced. Giving an emphasis to the gap between the values of the average mean, it can be inferred that there is a statistically significant difference in this indicator of self directions skills standard on 21st century skill.

Other than that, the global connection skills also showed a result of statistically significant difference. It has been clearly showed by the indicator “study the geography of distant countries” wherein the faculty has an average mean of 3.08 which is interpreted as frequently practice while students average mean on this indicator is 2.92 with a verbal interpretation of rarely practice. By this manner this indicator has been found to be missed out by faculty members on their pedagogical skills, as it was perceived the students as rarely practice on their pedagogical skills. Since, according to Savin-Baden (2014) global connection is about comprehending and acting upon issues and perceptions from diverse societies, geographies, and global realms and frequently regarded as the most challenging skills for students to learn, global connection skills enable students to explore and interpret a variety of data types that are deeply ingrained in culture. (Wilcox D., Liu J. C., Thall, J., & Howley T., 2017). Thus, it is empirical that the faculty members should enhance their pedagogical skills concerning the indicators of global connection.

Finally, it was discovered that the local connection skills level for 21st century competence had a statistically significant gap. The measure "assess own abilities for effectively establishing local relationships" has an average mean of 3.41 for faculty members and 3.13 for students, both of which are perceived as regularly exercised. Since their average means were nearly identical, it could be concluded since it is the lowest predictor.

As a result, the researchers found out that the Self-Direction Skills, Local Connection Skills, Global Connection skills and Communication Skills should have a significant focus on the faculty members' pedagogical skills. Stated indicators on these standards should be practiced more often on their pedagogy. Although these set of standards of 21st century skills had been found to be frequently practiced as perceived by the faculty members and students in the university, still the data denotes that there should be a room for development on their pedagogical skills. Conferring to Ali, S., & Maat, S. M., (2019), the teachers are the factors that underpin success in building the 21st century skills of students. Therefore, teachers can also contribute to the students' weakness if they are not well-equipped with the 21st century skills. In addition, teachers also play the key role in keeping up with the progress of education development. Teachers are required to understand and be willing to make changes in teaching and learning to suit the 21st century learning. Thus, the teachers' 21st century pedagogy practices were seen as an effort that should be taken seriously.

Conclusion

Based on the findings of the study, the following conclusions were derived, according to the demographic profile of the instructor-respondents, the most respondents are between the ages of twenty-six to thirty, thirty-one to thirty-five, and thirty-six to forty. It shows that the female instructors are the most respondents. And according to the results of the study, the length of service of instructors with ten years beyond and one to three years of service has the largest number of respondents. The professors of the College of Criminal Justice are the college that engages the most. Most of the instructors have the academic rank of Assistant Professor II, according to the results. Based on the current demographic profile of the student-respondents, most of the respondents are between the ages of eighteen and twenty-one. The females comprise most of the respondents. Bachelor of Science of Criminology is the course with the most participants. While the College of Education had the highest participation rate. Finally, it was discovered that the local connection skills levels for 21st century competence had a statistically significant gap. The measure "assess own abilities for effectively establishing local relationships" has an average mean of 3.41 for faculty members and 3.13 for students, both of which are perceived as frequently exercised. Since their average means were nearly identical, it could be concluded since it is the lowest predictor. As a result, the researchers conclude that the Communication Skills, Self-Direction Skills, Local Connection Skills, and Global Connection skills should have a significant focus on the faculty members' pedagogical skills. Stated indicators on these standards should be practiced more often on their pedagogy. Because the teachers are the factors that underpin success in building the 21st century skills of students. Therefore, they can also contribute to the students' weakness if they are not well-equipped with the 21st century skills. In addition, they also play the key role in keeping up with the progress of education development which requires them to understand and be willing to make changes in teaching and learning to suit the 21st century learning. Thus, their 21st century pedagogy practices were seen as an effort that should be taken seriously.

Recommendations

a. The high extent of agreement on how the teachers facilitate their pedagogical tasks, particularly in the Critical Thinking Skills, Communication Skills, Collaboration Skills, Creativity and Innovation Skills, Self -direction Skills, Local Connection, Global Connection, and Use of Technology as a Tool of Learning, shows that teachers frequently practice their skills in accordance with the principles of the 21st century teaching. It can be concluded that the teachers are fully aware of their pedagogical tasks as guided by the general principles of 21st century teaching; Therefore, it can be concluded that the above-mentioned criteria were all carried out by the teachers as perceived by the learners. Based on the findings of the study, the following recommendations were drawn to enhance the 21st century pedagogy of the board course/program at the Taguig City University.
b. Higher Education Institution must provide assessment tools and adequate resources to support the enhancement of outcome-based activities.
c. Taguig City University should support and develop faculty members to promote best practices in teaching and learning in attaining high quality experience. The institution can develop more detailed goals, assessments, and professional development opportunities pertinent to their field and student needs.
d. Faculty members must be equipped with information technology and media through seminars and training in order to keep up with the generation's pace. Faculty members should continually improve their professional development, attributes, and, of course, personality development. Immerse themselves in 21st-century skills and workforce preparation in order to better train students for life and career demands.
e. Teaching interns must attend more seminars/webinars and workshops to enhance their teaching methodology. They should be more exposed in the field of teaching to acquire the 21st century skills standards and must be guided by the teachers in terms of conducting constructive criticism

for the overall performance. Leading to a more prepared and well-equipped in the field of teaching. Future researchers should conduct related or future research with similar in using the same set of 21st century pedagogy. The result should be compared to the findings of this study. In comparing the results, one might draw more conclusions or gain more insight into the extent to which 21st century skills are incorporated into the overall academic program at the institution.

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An Assessment on the Extent of Implementation of Outcome-Based Education in a Polytechnic College in Bicol Region

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Abstract - Ever since the Commission on Higher Education (CHED) mandated all HEIs to shift from input based to outcomes-based education paradigm, quality has become the ultimate obligation of all HEIs in the Philippines. Conforming to quality standards is no longer an option or an inspiration but a directive to ensure that only the best and quality education and services be dispensed for the graduates to be skilled, competent and responsive to local and global development needs. On this note, the researcher is spurred to assess the extent of outcome-based implementation of faculty using the descriptive-quantitative research approach. Specifically, it sought to determine the extent of implementation of the faculty on OBE using the OBE implementation inventory tool; the practices of the faculty on OBE implementation along instruction; and the problems encountered by the respondents in implementing OBE. Over-all results indicate that OBE is implemented to a high extent; instructionally practiced to a moderate extent, and most identified possible problems are less encountered.

Keywords - Assessment; outcome-based education; implementation

Introduction

The demand for quality education nowadays is never as primordial as before. In fact, it is a mandate to all Philippine higher education institutions to attain the highest level of quality and to contribute to building a liveable nation where everyone becomes productive and well-rounded. Quality education, not just a tagline but is translated and actualized by its graduates who possess the necessary skills and competency required by current global markets.

Because the Philippines has been lagged behind by its neighbouring countries in terms of global competitiveness resulting in steady increase of jobs mismatch and unemployment, the Commission on Higher Education is spurred to advocate the outcomes-based education which focuses on competency-based learning and supports quality and quality assurance processes. In fact, CHED wants every higher education institution to develop and strengthen the internal quality assurance system so that the desired culture of quality may be manifested and translated to measurable learning outcomes. (CMO 46, s. 2012)

Outcome-based education is now the buzzword in Philippine education. The shift toward OBE Instruction is analogous to the total quality movement in the education sector. It focuses on students' demonstration of the learned skills and content through their outcomes. Hence, it contrasts with traditional education, which primarily focuses on the resources that are available to the student, which are called inputs (An, 2014).

A certain college in Bicol commits itself to dispense quality and excellent education and services to its clientele in Rinconda and beyond. It envisions itself to be the center of excellence in polytechnic education. In its 38th year Charter anniversary, it paves its way to conversion towards universityhood. In fact, just recently, the joint CHED-CHTE on-site evaluation was successfully conducted to ensure that the policies and guidelines of CHED on the program offerings, research, extension, and student services have been complied by the institution. CHED is adopting an outcome-based approach to assessment, that is, the evaluation system is based upon outcome, looking particularly into the intended, implemented, and achieved learning outcomes (CMO 46, S. 2012).

Prior to it, the College subjected its three graduate programs and two undergraduate programs to AACCUP evaluation using the outcomes-based program accreditation instrument. Before the year ends, it lines itself up with two major quality assurance mechanisms, such as the ISA visit and Institutional accreditation which look into the system, implementation, and outcomes of all the key result areas using the outcomes-based instruments.

OBE is not new to the faculty members of the College. In fact starting 2015, OBE became part of the discussions in the administrative, academic, and faculty meetings. Key officials and academic heads are sent to a series of OBE seminars and training. In-house capability-building seminars were also conducted to orient and to equip faculty members especially the Engineering faculty with the necessary knowledge and skills in preparation for OBE implementation.

However, various problems were encountered during the first AACCUP evaluation visit using the outcomes-based program instrument. Most of the documents that are available especially on Area III: Curriculum and Instruction, only measure the system or inputs. There is no proper documentation of evidence from the implementation to the assessments and evaluation on the effectiveness of the program educational objectives to prove that graduates are really equipped with essential knowledge, values (behaviour) and skills that can contribute to the development of Rinconada and beyond.

Further, with the intake of sixty-two newly hired faculty members on plantilla positions, who for some are coming from other industries other than education sector, it is therefore a necessity to monitor these faculty members on their implementation of OBE approach. Therefore, it is on this note that spurred the researcher to look into the degree of implementation since it is expected that the College in general has transitioned to the OBE framework.

Limited number of studies about OBE implementation has been conducted by various researchers particularly in the Philippine setting. Guzman, et. al (2017) and Labrador, et.al (2014) focused on the extent of OBE knowledge and practice of the Engineering faculty members in Ramon Magsaysay Technological University (RMTU), Zambales and in Lyceum of the Philippines University – Batangas. Researchers such Caguimbal, et.al, (2013), An (2014), Liezel D. Borsoto, et.al (2014), Macatangay (2016) investigated the impact of OBE implementation and practices to students as perceived by them. While the study of Liezel D. Borsoto, et.al (2014), and Macatangay, et.al (2016) determined the status of implementation in terms of practices and environment as well as its usefulness in terms of academics, attitudes and instructions of OBE.

Hence, this study intended to bridge a gap to determine the extent of implementation of outcome-based education of the polytechnic college last SY 2019-2020 as against the OBE Implementation Tool. Further, it determined the instructional practices of the faculty that are adherent to OBE implementation, as well as the problems encountered in implementing it. As such, this study will serve as a good source of feedback and inputs for planning and organizing a faculty development programs that cater to the needs of improving the OBE implementation in the College and to establish corrective actions on the areas where they need more understanding for them to participate in the compliance of the documents needed for program and institutional accreditation.

Methodology

This research was carried out through the descriptive-quantitative research design wherein data were gathered through adapted questionnaires from the previous studies conducted by Guzman, et. al (2017), Labrador, et.al (2014) Caguimbal, et.al, (2013), An (2014), Borsoto, et.al (2014), Macatangay (2016) and some from internet sources. However, some questions and statements in the questionnaire are modified and made by the researcher. The questionnaire method elicited data as to their assessment of their OBE implementation, and problems encountered along the practice on OBE implementation of the faculty members of the College.

The locale of the study is at a certain polytechnic college in Bicol Region. The researcher employed a complete enumeration of population of 129 or 100% of the total population of regular faculty members of CSPC. However, during the retrieval of the distributed questionnaire, only 92 faculty positively responded to this study.

The researcher selected the topic and explored online databases relative to the topic to gather sufficient data. Then, the topic with the set of statements of the problem were presented to the panelists during the in-house review of research proposals. Upon the approval of the study, the researcher sought permission from the concerned College Deans through a formal letter on the conduct for the purpose of my study. The questionnaire, as my data gathering tool, was personally distributed to the respondents. There was an attached letter to inform the respondents on the purpose of the study and about the confidentiality of their responses. During the retrieval, the researcher conducted an informal interview with the respondents which was used to supplement the primary data. The data gathered was tabulated, organized and interpreted quantitatively.

The researcher used several tools to treat the data gathered. The responses of the respondents were classified and tabulated systematically according to different variables included in the study. All the data gathered were presented quantitatively. The statistical tools used were the following: percentage technique, weighted mean, Four-Point Rating Scale, and Spearman Rank-Order Coefficient of Correlation (rs).

Results and Discussions

Table 1 shows the distribution of the respondents according to the level implementation of OBE in the College using the OBE implementation inventory tool as adapted from several past studies. The respondents were asked to assess if the statements in the OBE inventory tool are being implemented in the College. On this data gathered, out of the nine OBE implementation inventory indicators, six (6) statements are being implemented to a high extent; while three (3) are implemented on a moderate extent only. These three statements are: Students and staff of the College are made aware of the existence of an outcome statement and are familiar with in with 3.08 WM; there is a meaningful discussion among the faculty on every discipline on what to include in the syllabi in consideration of learning outcomes, 3.15 WM; and that is there is a clear statement of institutional program, and course learning outcomes, got a weighted mean of 3.17. These findings explicitly suggest that learning outcomes, particularly the Institutional learning outcomes are yet to be crafted; while the periodic review of the course contents are as well to be conducted on a regular basis. According to CMO 46, series of 2012, translation of quality means that the learning outcomes, institutional and programs, must be aligned with VMG. They should also be disseminated as well for familiarization of all stakeholders for them to be made aware of the outcome statements for the graduates to meet an acceptable level of knowledge, skills, and attitude demanded by their different fields of practice. Furthermore, accreditation demands that program outcomes must be aligned with the mission and educational objectives and the OBE system is supported by a continuous quality improvement program (CMO No. 77, s.2012).

Table 1. Assessment on the Extent of OBE implementation

OBE Implementation Inventory Tool	Weighted Mean	Verba Interpretation
There is a clear statement of Institutional, program, and course learning outcomes	3.17	Moderate Extent
Students and staff of the College are made aware of the existence of an outcome statement and are familiar with in	3.08	Moderate Extent
The syllabus features purposeful and varied activities targeted specifically at the exit learning outcomes	3.25	High Extent
There is a meaningful discussion among the faculty on every discipline on what to include in the syllabi in consideration of learning outcomes	3.15	Moderate Extent
There is a periodic review of the course contents to suit specified Programming Outcomes, current development, industrial needs, job specifications, accrediting/certifying body requirement, etc.	3.26	High Extent

Learning outcomes are used to assess a student's progress towards the exit learning outcomes	3.23	High Extent
The assessment method adopted matches with the learning outcomes and informs decisions taken as to whether a student has or has not achieved the stated outcomes	4.58	High Extent
The education environment supports the attainment of the learning outcomes by providing learning environment that caters the development of students as future professional, promotes values formation and character traits ideal to different employment settings	4.68	High Extent
Students' admission to a particular program/course are based on academic criteria and not based on opinion or accommodation by request.	4.70	High Extent
Average Weighted Mean	**3.68**	**High Extent**

Table 2 enumerates the practices of faculty members that are supportive of OBE implementation along with instruction. As shown, the selection of teaching theory that is practical to student's everyday life is implemented highly by the faculty members as denoted by the computed weighted mean score of 3.54 on rank number 1. The remaining OBE implementation practices are implemented, ensuring that learners know exactly what is expected from them, 3.49, HE; followed by having records or documents to show the use of Rubrics, 3.47; providing a chance for the students to undergo remedial or other corrective actions for learning, 3.41; utilizing the quizzes as direct assessment technique on OBE, 3.34; using of a rubric to assess all the outputs or requirements submitted by my students, 3.30.

Moreover, aligning the curriculum and assessment to the intended learning outcomes, NOT to the subject matter/contents, 3.23; using a public assessment so that students know if they are able to achieve the intended learning outcome, 2.98; using all the results of student achievement as the final result of all students prior learning, and the average of all the results of the students' activities, 2.92; having all the evidences cited above submitted to the Dean's Office, 2.75; participating in the formulation of program learning outcomes of the College, 2.71; requiring all the students to keep their exams and activities in a portfolio for analysis by using a student's monitoring sheet, 2.68; having a table of specifications that clearly shows the relationship of course learning outcomes to teaching learning activities/strategies to assessment tasks, 2.67; and the using of at least 10 varied, personalized, and digital resources to design and deliver content, 2.62. These are all implemented by the faculty members through instruction.

The average weighted mean score is 3.08 implies that faculty members are implementing or practicing the OBE in the delivery of their instruction as well as in the documentation of the evidence to show its implementation. This study also confirmed the practice of Engineering Faculty members in Lyceum of the Philippines University-Batangas (Dotong, 2014).

Table 2. Instructional Practices along OBE implementation

OBE Practices	Weighted Mean	Verba Interpretation
I select teaching theory that is practical to my student's everyday life	3.54	High extent
I participate in the formulation of program learning outcomes of the College	2.71	Moderate extent
I provide a chance for the students to undergo remedial or other corrective actions for learning	3.41	Moderate extent

I ensure that learners know exactly what is expected from them as unit standards make it very clear what is required from them	3.49	Moderate extent
I utilize the quizzes as a direct assessment technique on OBE.	3.34	Moderate extent
I use a rubric to assess ALL the outputs or requirements submitted by my students	3.30	High extent
I have records or documents to show the use of Rubrics	3.47	High extent
I use public assessment so that students know if they are able to achieve the intended learning outcome	2.98	Moderate extent
I align the curriculum and assessment to the intended learning outcomes, NOT to the subject matter/contents.	3.23	High extent
I use student achievement at the end of the learning period as the final result of all students prior learning, NOT the average of all the results of the students' activities.	2.92	Less extent
I require the students to keep their exams and activities in a portfolio for analysis by using a student's monitoring sheet.	2.68	Less extent
I have table of specifications that clearly shows the relationship of course learning outcomes to teaching learning activities/strategies to assessment tasks	2.67	High extent
I use at least 10 varied, personalized, and digital resources to design and deliver content.	2.62	High extent
I have all the evidences cited above submitted to the Dean's Office	2.75	High extent
Average Weighted Mean	**3.08**	**Moderate Extent**

The problems encountered by the faculty in implementing OBE through their instructions are being shown in Table 3. On this data gathered, out of 12 listed problems, the two problems emerged as encountered by the faculty. First in rank is they don't know how to align the assessment to the Institutional Learning Outcomes and Program Learning Outcomes, with 2.63 weighted mean, followed by the problem on large class size of more than 40 hinders, with 2.53 weighted mean.

There is also a problem which has never been encountered by the faculty in OBE implementation, which is on facilitating an OBE class, with a weighted mean of 1.44. The remaining statements are encountered on a lesser extent. By and large, the average weighted mean is only 2.01 which was interpreted as less encountered.

Table 3. Assessment on the Extent of OBE implementation

OBE Implementation Inventory Tool	Weighted Mean	Verbal Interpretation
I don't know where to start with an OBE approach in class.	1.56	Less Encountered
I don't know how to facilitate an OBE class.	1.44	Not Encountered
My knowledge of the assessment techniques for OBE is inadequate.	1.74	Less Encountered

Large class size of more than 40 hinders the efficient implementation of OBE.	2.53	Encountered
My daily schedules do not allow for adequate preparation of OBE approaches.	2.10	Less Encountered
The class schedule is too short for daily implementation of OBE.	2.00	Less Encountered
I don't have available resources to present my lessons using OBE approach	1.82	Less Encountered
I don't have adequate orientation and training for OBE in the College.	1.90	Less Encountered
I don't know how to align the assessment to the Institutional Learning Outcomes and Program Learning Outcomes	2.63	Encountered
While OBE emphasizes student-centered approach, students still heavily rely and expect teachers to teach everything as dispenser of knowledge	2.21	Less Encountered
I don't know how to document evidence for OBE implementation in my class/es.	2.09	Less Encountered
Grading system of the College requires the traditional assessment method such as pen-and-paper test and in contrary to OBE principles.	2.16	Less Encountered
Average Weighted Mean	2.01	Less Encountered

Conclusion and Recommendations

It is concluded that the OBE principles using the OBE inventory tool are implemented in the College, except for the periodic review of course contents and the presence of institutional learning outcomes which are implemented to a lesser extent. OBE is implemented in the instructional practices of the faculty members of CSPC. It is highly implemented in the selection of teaching theory that is practical to students' everyday life. A number of faculty encountered problems pertaining to the implementation of OBE particularly in aligning the assessment to ILO and PLO and with the class size. To address these problems, some faculty enhancement training on OBE is put forward.

Thereby, it is recommended that the College should intensify its continuous and sustainable monitoring on the implementation of OBE. Administrators must take a lead in implementing programs and projects that will truly manifest the OBE culture and not just remain on paper before we can truly claim the adequate OBE implementation. All faculty members should be updated with the latest trends and needs of the industry to prepare their students for the world of work upon their graduation. They should also attend seminars and training that will strengthen their knowledge and practices on OBE principles. They should know by heart how to truly apply the concepts in their teaching and learning contexts. Policy in class size should be revisited as well to give consideration to the faculty who are dealing fifty and more students each course. Finally, future researchers may conduct related or follow-up study on OBE implementation focusing on the actual implementation through syllabus analysis.

Acknowledgement

My heartfelt acknowledgement to all who are one way or another help this research undertaking possible. Specifically, to God Almighty for giving me the strength and motivation to push through despite challenges along the way. To the respondents of this study for sparing their precious time to respond to the questionnaire. And lastly, to the Administration of my beloved institution for the financial support afforded me for making this study successful. To God be all the glory!

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Adaptive and Contextual Performance of the Food Technology Graduates: Basis for Curriculum Enhancement

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Abstract - This study pursued to determine the socio-demographic profile of employer/manager of food/hotel industries in Zamboanga City in terms of age, length of service and educational attainment. It also sought to determine the level of adaptive and contextual of skills of food technology graduates of Bachelor of Science in Industrial Technology major in Food Technology in terms of the adaptive and contextual skills. At some degree, the study also attempted to determine the significant differences when variables were categorized according to its profile. This study utilized the descriptive quantitative-qualitative design to establish the level of adaptive and contextual skills of food technology graduates of Zamboanga City State Polytechnic College and significant differences when variables were categorized according to age, length of service and educational attainment as well as to determine what problems/ gaps the college (CET) needs to address in order to develop the adaptive and contextual skills of the Food Technology Graduates and to include what intervention can be developed to strengthen or improve the performance of the Food Technology Graduates.

The study concluded that most of the managers of the graduates of Bachelor of Science in Industrial Technology- Food Technology were in their mid and late 20's and are in their prime age. All managers/employers of food industries are still on their baccalaureate degree and were not yet decided to pursue higher education. Majority of the managers in food and hotel industries were still new in service. The level of adaptive and contextual skills of the food technology graduates was "Highly Satisfied" which implicates that the food technology graduates were performing very well at their workplace and connotes that the institution is providing competent graduates in food technology curriculum who were socially responsible and independent as well as met the demands of their respective employers in their workplace. Respondent's profile was not considered predictors in their level of satisfaction on the adaptive and contextual skills of the BSIT- FT graduates. The respondents expressed that graduates lack leadership skills, self-confidence and communication skills. This means that these areas should be improved within the curriculum and teachers handling said program shall focus on these aspects as they are producing college-degree graduates and one expectation from it is that they were trained with regards to managerial skills and so they must posses within them leadership skills. Linkages with industries could be established so that the college will have a clear grasp of what is the in-demand skills needed in the industry. In terms of their contextual skills, more than half of the respondents claimed that the graduates were doing well in their establishment and possess the needed contextual skills. This implies that the BSIT Food Technology Program is indeed preparing graduates to acquire the needed contextual skills according to their field of specialization which are believed of great use when they will be employed in the actual work. On the other hand, still few suggested that managerial skills of the graduates should be improved and consultation with industries is imperative.

It was therefore recommended that the findings of this study may be used as basis for consideration in developing, enhancing or revising the content of the curriculum aligned with the needs of the industries that shall enable the food technology graduates maintain and improve the needed adaptive and contextual skills of the food/ hotel industries. The skills of the graduates in their field of specialization and their attributes such as leadership, management, critical thinking and managerial abilities could be reinforced and considered in revisiting/ enhancement of the curriculum. Moreover, college administrators shall maintain active and strong collaboration with the industries to craft interventions focusing on the skill set and total attributes of the graduates that needs to be developed to refine and prepare them as they leave the college and seek for employment. Lastly, the faculty handling the various courses within this program may consider the findings of this study and strengthen their training pedagogy on the students for them to be competent on the various skills they should learn embedded in said program.

Introduction

Teachers play a vital role in higher education institutions in producing quality graduates who are job ready for respective industries. The Zamboanga City State Polytechnic College is offering the Bachelor of Science in Industrial Technology major in Food Technology (BSIT-FT), wherein the vision of the institution is to provide globally competitive human resources with this, the graduates of the program connotes that the institution is mandated to prepare their graduates in the world of work with competent skills. On the other hand, efficiency of an educational program offered by an educational institution can be measured through the competencies of its graduates, the knowledge and skills of the graduates can be applied in the work environment and the knowledge and skills that the graduates possessed can be determined through the feedback from employers of the graduates in their work. Hence, the aftermaths of any educational programs can be best measured in terms of how well the graduates applied their acquired competencies in the real workplace. In this connection, to prove this venture, it is a must to follow-up the updates on the employment of the graduates of the BSIT-FT program in order to gathered vital information for the institution to capitalize on its strength and identify its area of improvement for further improvement of the training and enhancement of the curriculum to produce quality of graduates on the neighbouring industries.

In lieu with the aforementioned, the employability of graduates from an institution is very important concern of HEI's. Evidences indicate a growing apprehension to evaluate the performance of graduates, the relevance of the curriculum offered, and the satisfaction of alumni with their academic preparations through tracer studies of graduates (Antiojo, L.P., 2018). Furthermore, Valenzuela, et. al. (2012) asserted that graduate's employability is a function of a range of individual characteristics. Employability attributes include significant manageable skills such as adaptability, intellectual skills, teamwork and basic interpersonal skills and their usefulness to the graduates in their jobs.

Contextual performance goes beyond formal job responsibilities and also referred to as "discretionary extra-role behavior" in which it is reflected as activities such as coaching co-workers, strengthening social networks within an organization and going extra mile for the organization. On the other hand, Befort and Hattrup (2003), stated on their research that more experienced manager's value contextual performance to a greater degree than less experienced managers and over time, managers gain a better appreciation of how task performance is related to the overall organizational context. Managers can learn to focus more on behaviours that are contribute to social connectedness and promote a positive work climate. (Koopmans, et. al. 2011).

Meanwhile Charboonier-Voirin (2012), research explains that adaptive performance refers to the ability of an individual to change his or her behaviour to meet the demands of a new environment. The concept is relevant to firms that face especially complex and volatile business conditions.

Furthermore, satisfaction is the perceived level of pleasure and contentment derived from individual performance. Satisfaction, in addition to values and competence, is the motivating force for occupational behavior. Journal: Work, vol. 16, no. 3, pp. 219-226, 2001.

Moreover, it was observed that the objective of every State Universities and Colleges in the Philippines is to produce graduates that are competent in the field chosen and an expectation to land a job, whereas industries also are expecting rigid training of skills on the graduates from an institution for their employability. However, due to the issues and concerns in a particular program offered in government higher education institutions like insufficient instructional materials and equipment, industries and companies are facing problems in hiring a new employee that will fit the job description needed by industry.

In line with this, the focused of this research study is to specifically determine how the graduates of Bachelor of Science in Industrial Technology major in Food Technology (BSIT-FT) from the year 2015-2019, performed in the real world of work on the point of view of employers/ managers and how satisfied they are on contextual and adaptive skills performance of the graduates of Zamboanga City State Polytechnic College.

Methodology

This study utilized the descriptive quantitative-qualitative research design. This research design was considered appropriate for the fact that the research study was aimed in determining the level of satisfaction of employers towards the adaptive and contextual skill of food technology graduates. Moreover, it also described the difference in the satisfaction of employers on the adaptive and contextual skills of food technology graduates when categorized according to the socio-demographic of employers. More so, the study also focused on what were the problems/ gaps the college (CET) that needs to be addressed in order to develop the adaptive and contextual skills of the Food Technology Graduates.

According to McCombes (2019), a descriptive research design can use a wide variety of research methods to investigate one or more variables. Unlike in experimental research, the researcher does not control or manipulate any of the variables, but only observes and measures them. Additionally, descriptive research is used to obtain information concerning the current status of the phenomena “what exist” with respect to variables condition in a situation (Kenton, 2007).

Furthermore, it is deemed as quantitative research for it used numerical data to analyze the problem which were obtained from the employers of food technology graduates using a self-made survey questionnaire. On the other hand, this study also utilized the qualitative design as the researcher conducted personal interview to have an in-depth data as to what were the problems/ gaps the college (CET) that needs to be addressed in order to develop the adaptive and contextual skills of the graduates.

Results and Discussion

The qualitative results above indicate the recommendations of the various respondents as to what interventions could be developed so that the performance of the BSIT- FT can be further enhanced. Based on the tallied data, almost half of the entire sample respondents who were interviewed stated that the college could develop a program that focuses on improving the skills and performance of the graduates through trainings and workshops which are industry-based. In addition, a close attention may be given to honing the confidence, self-esteem and management skills of the graduates. This provides an implication that the program needs to strengthen the involvement of students in activities that will reinforce their skills with regards to their field of specialization. This is also because that there are only very few identified activities in the college that deals on acquisition of skills needed by the present industry. Skills competition conducted within the college is also not consistent. Likewise, part of it could also be associated with the courses/ subjects offered within the program/ curriculum wherein management subjects were not given much attention and students were not able to exercises this skill in the real context during their stay in the college as well as in their industry immersion or on-the-job training. These implications rationalizes the need of the college to focus on these challenges in order to aid graduates to be holistically refined and prepared in real context of work in the industry.

This is also supported by the study of Abelha, et. al. (2020), who pointed out in the findings of their study that there is a need for higher education institutions to meet the needs of the labour market, generally acknowledging the existence of a mismatch between the competences developed in higher education and those that are favoured by employers. Nevertheless, efforts towards aligning the needs and expectations of potential employers and the curricula of the programs under analysis are also recognized. They also point out a critical concern about the roles that the market should assume in the definition of higher education curricula. If it is undeniable that concerns about employability are pressing and meeting the demands of employers is a necessary route toward promoting the ready insertion of graduates in the labour market, one cannot forget that academia is more than a promotor of employability. Moreover, market demands are rapidly shifting, and intending to meet market requirements rather than acting proactively and preparing adaptable and critical professionals may have detrimental results. Stressing the importance of developing higher-order skills, even if not immediately sought for by employers, remains relevant. An open and continued dialogue between academia and employers, with two-way contributions, may prove a worthy undertaking.

Conclusion and Recommendation or Summary of Findings

Conclusions

On the basis of the findings, the researcher concludes that:

Most of the managers of the graduates of Bachelor of Science in Industrial Technology-Food Technology were in their mid and late 20's and are in their prime age. This implies that employers nowadays are banking on young employees as they believed that they could be of optimal use in their establishment. All managers/employers of food industries are still on their baccalaureate degree and were not yet decided to pursue higher education. This implies that the respondents don't focus much on their educational qualification as it is not directly considered to be a basis for their promotion or any incentives and is not a requirement in their line of work. Majority of the managers in food and hotel industries were still new in service.

The level of adaptive and contextual skills of the food technology graduates was "Highly Satisfied" which implicates that the food technology graduates were performing very well at their workplace and connotes that the institution is providing competent graduates in food technology curriculum who were socially responsible and independent as well as met the demands of their respective employers in their workplace.

Recommendations

In view of the findings and conclusions made in this study, the researcher recommends that:

The results of the study may be used as basis for consideration in developing, enhancing or revising the content of the curriculum aligned with the needs of the industries that shall enable the food technology graduates maintain and improve the needed adaptive and contextual skills of the food/ hotel industries.

The skills of the graduates in their field of specialization and their attributes such as leadership, management, critical thinking and managerial abilities could be reinforced and considered in revisiting/ enhancement of the curriculum.

College administrators shall maintain active and strong collaboration with the industries to craft interventions focusing on the skill set and total attributes of the graduates that needs to be developed to refine and prepare them as they leave the college and seek for employment.

The faculty handling the various courses within this program may consider the findings of this study and strengthen their training pedagogy on the students for them to be competent on the various skills they should learn embedded in said program.

Respondent's profile was not considered predictors in their level of satisfaction on the adaptive and contextual skills of the BSIT- FT graduates.

As the respondents expressed that graduates lack leadership skills, self-confidence and communication skills. This means that these areas should be improved within the curriculum and teachers handling said program shall focus on these aspects as they are producing college-degree graduates and one expectation from it is that they were trained with regards to managerial skills and so they must possess within them leadership skills. Linkages with industries could be established so that the college will have a clear grasp of what is the in-demand skills needed in the industry. In terms of their contextual skills, more than half of the respondents claimed that the graduates were doing well in their establishment and possess the needed contextual skills. This implies that the BSIT Food Technology Program is indeed preparing graduates to acquire the needed contextual skills according to their field of specialization which are believed of great use when they will be employed in the actual work. On the other hand, still few suggested that managerial skills of the graduates should be improved and consultation with industries is imperative.

Findings

After a systematic and comprehensive analysis of the data collected, this study showed the following findings:

a. There were 54% that belongs to 25-29 years old, 32% were within ages 30-34 years old, 7% for both ages under 24 years old and below as well as in 40 years old and above. With respect to their educational attainment, 100% of the sample respondents were college graduate. Meanwhile, 61% of the employers/ managers were within 5 years and below in service followed by 21% with working experience at 11-15 years and the remaining 18% were in their work for 16-20 years.
b. The managers from different hotels and food establishment were highly satisfied on the level of adaptive and contextual skills performance of the food technology graduates with an over-all-mean of 3.49 and 3.41 respectively.
c. There was no significant difference on the level of adaptive and contextual skills of the respondents when data were grouped according to the respondents' profile.
d. Results from the interview manifested that the respondents expressed that the BSIT- FT graduates lack leadership skills, self-confidence and communication skills. There is also a need for consultation from the hotel and restaurants so that skills will be aligned with the industry needs. Meanwhile, others articulated that the graduates employed in their establishment were doing good with their adaptive skills and they did not experienced problem with them. Along this line, few of them said that management skills should be inculcated within the graduates as they will need this for their future career. On the other hand, more than half of the respondents claimed that the graduates were doing good in their establishment and possess the needed contextual skills. Also, few suggested that managerial skills of the graduates should be improved and consultation with industries was imperative.
e. Almost half of the entire sample respondents who were interviewed stated that the college could develop a program that focuses on improving the skills and performance of the graduates through trainings and workshops which are industry-based. In addition, a close attention may be given to honing the confidence, self-esteem and management skills of the graduates.

Acknowledgement

First and foremost the researcher with all humility and grateful heart, gives praise and honor to the Almighty God, the source of all wisdom, for granting him the strength, hope faith, confidence, and the will that enabled him to finish research endeavour.
The researcher wishes to express his sincerest gratitude and warm appreciation to the following people who had contributed much in helping shape and reshape this valuable piece of work.

Dr. Nelson P. Cabral, President of Zamboanga City State Polytechnic College and member of the panel for his educative suggestion to improve this study and extending high full support to the realization of this study.

Prof. Manuelito B. Tibor, his Thesis adviser of the study, for the intellectual guidance extended in each process in completing this study; for all the encouragement that strongly affect the researcher's morale towards his request to finish masteral studies and for his expertise in determining the construct validity and passed judgement on the appropriateness and suitability of the instrument.

Dr. Fe E. Lim, Dean of Graduates School in Zamboanga City State Polytechnic College, his panel Chairman, who generously shared her time and effort in appraising the contents of this research and for her valuable suggestions which helped in improve the study.

Prof. Arnel M. Fernandez, Zamboanga City State Polytechnic College, a member of the oral defense panel: for his encouragement and support on the research to improve his study and for his various suggestions and guidance.

Prof. Zaldy A. Jul, Zamboanga City State Polytechnic College, a member of the oral defense panel: for contributing his fully support to the fullest of his capabilities towards the achievement of the success of the study.

April Joy P. Sanico, Zamboanga City State Polytechnic College, his secretary on the oral defense. For her patiently and proficiently recording the minutes of the oral defense.

Romel G. Guillermo, Noralyn Guillermo and Dr. Nora M. Ponce for their prompt inspirations, timely suggestion with kindness, enthusiasm and dynamism have enabled me to complete the research.

Fati Mae G. Fernandez, Christine B. Sisnorio and Kensley Hofdhal for their untiring love, supports, guidance and motivations throughout the process of the research work.

Maria Cathie Q. Aljas and Clarisa V. Acac for their untiring love, supports, guidance and motivations during the time of frustrations.

Josephine J. Divinagracia ,Mavie L. Julio and Mercibelle A. Trinidad , for their cooperation and giving time and effort in terms of providing all the needed data by the researcher.

Carina M. Abidin, Bernadette J. Pagayonan ,Nurminie S. Tawasil and
Dr. Jocelyn I. Kong, Dr. Roy L. Valesco and Norwesa L. Madriaga for their kind endless help, generous advice and support during the study.

Shellane N. Santiago and Rosemeline S. Cordero for constantly support through motivations and prayers throughout the process of the research work.

Angelique A. Tahil , Junamil I. Ibrahim and Judily L. Dagohoy his friend for always extending their support throughout the process of the research work

To his Mother, Emma Manalo; for the unending support in terms of moral and spiritual love given to the researcher.

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Factor affecting Online Classes among Entrepreneurship Students of Quezon City University during the Pandemic era

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Abstract - The study assessed the identified problems of the selected students on the factors affecting online classes among Entrepreneurship students of Quezon City University. This significant factor are: learning factor, physical factor, emotional and social factor, and environmental factor. The respondents were Entrepreneurship Students from different year levels in the Quezon City University - College of Entrepreneurship. There were 300 respondents who participated in this study. The statistical tools utilized in this study were frequency and percentage, weighted mean, and one way ANOVA. The researchers used the systematic random sampling to individual students from different year levels in the aforementioned college. In this study, the researchers used questionnaire to gather the primary data. The survey questionnaire was formulated based on the reviewed related literature. This instrument was divided into three parts. The first part delve profile of the respondents. The second part deals with the factors of affecting online classes of the students and the third part ferret out difference on the respondents' assessment on the factors affecting online classes among Entrepreneurship students of Quezon City University when they are grouped according to profile. After gathering data they were complied, sorted out and tabulated. They were subject to statistical treatment in order to answer the questions posed in this study.

Keywords - Learning Factor, Physical Factor, Emotional and Social Factor, and Environmental Factor

Introduction

The Philippine educational system is struggling to adapt to the sudden and major shift from traditional to distance learning during the Covid-19 pandemic. The Department of Education (DepEd) has delayed the opening of the school year and has offered Self-learning modules to students at home. Authorities pledged to provide distance learning access for all students, whether through radio, television, modular, or online tools. President Rodrigo Duterte had previously announced that face-to-face classes has not been an option until a vaccine is rolled out, given that the number of cases continues to spike. Despite DepEd's assurance that every student should be able to handle the new form of learning, difficulties arise for those who lack resources.

COVID-19 has become a global health crisis. As of October 6, 2020, almost 36 million people have been infected and over one million have died. In the Philippines, this translates into almost 325,000 infected and 6,000 deaths (Worldometer, 2020). To curb the spread of COVID-19, most governments have opted to employ quarantine protocols and temporarily shut down their educational institutions. As a consequence, more than a billion learners have been affected worldwide. Among this number are over 28 million Filipino learners across academic levels who have to stay at home and comply with the Philippine government's quarantine measures (UNESCO, 2020).

Lockdown is a state of the emergency protocol implemented by the government to restrict people from leaving their houses resulting in mass quarantines and stay-at-home across the world since March 2020. The whole educational system has been collapsed during the lockdown period of the corona virus disease 2019 (COVID-19) and most of the college educator have encountered similar kinds of challenges and issues. Informal and non-formal education is also tremendously affected. However, it is a well-established assumption that no pedagogical approach can replace the peak position of formal education due to having professor taught direct interaction.

To respond to the needs of learners, especially of the 3.5 million tertiary-level students enrolled in approximately 2,400 HEIs, certain HEIs in the country have implemented proactive policies for the continuance of education despite the closure. These policies include modified forms of online learning that aim to facilitate student learning activities. Online learning might be in terms of synchronous, real-time lectures and time-based outcomes assessments, or asynchronous, delayed-time activities, like pre-recorded video lectures and time-independent assessments (Oztok et.al., 2013). Case in point are top universities in the country, viz., De La Salle University (DLSU), Ateneo de Manila University (AdMU), the University of Santo Tomas (UST), and the state-run University of the Philippines, Diliman (UPD).

As the aftermath of COVID-19 crisis exist, online education became a pedagogical shift from traditional method to the modern approach of teaching-learning from classroom, from personal to virtual and from seminars to webinars. Previously, e-learning, distance education and correspondence courses were popularly considered as part of non-formal education, but as of now, it seems that it gradually replaces the formal education system if the circumstances enduringly persist over the time.

Methodology

This study used the descriptive method of research which describes the nature of a situation, as it exists at the time of the study. The descriptive research involves the collection of data in order to test the hypotheses and to answer questions concerning the current status of the subject study. According to Best (2005), a descriptive method of research is concerned with the condition of relationship that exists, practices that prevail, belief, points of view, or attributes that are held, processes that are going on, effects that are being felt or trends that are developing. The researchers also solicited ideas to solve the problem. Survey method is found to be the easiest way of collecting data to determine the awareness of the respondents. It is a valid method for researching specific subject and as precursor to more quantitative studies. While there are some valid concerns about the statistical validity, as long as the limitations are understood by the researcher, this type of study is invaluable scientific and random tool. Although the results are always open to question and to different interpretations, there is no doubt that such is a helpful tool in performing a research.

Results and Discussions

The purpose of the study was to examine the factors affecting online classes among Entrepreneurship students of Quezon City University during the pandemic era in the aspects of Learning Factor, Physical Factor, Emotional Factor and Environmental Factor. This study used the descriptive research design which described the data and characteristics of the sample studied. The respondents were the three hundred (300) entrepreneurship students of Quezon City University. The statistical tools utilized in the study were frequency and percentage, weighted mean, and ANOVA.

Based on the presentation of gathered data, the findings of the study are as follows:

1. Profile of the respondents according to age, gender, civil status and college year level. The following are the profile variables of the respondents:
   - In terms of age, 53.3% of the respondents are 21-22 years old, while 19% are 19-20 years old. Twelve point three percent of them are 23-24 years old, while 11% are 25 years old and above. Lastly, 1.3% are 17-18 years old.
   - In terms of gender, 213 (71%) are female while 73 (24.3%) are male. Meanwhile, 14 (4.7%) are form the LGBT. In terms of civil status, 282 (94%) are single, while 15 (5.0%) are married. Meanwhile, 3 (1.0%) of them are solo parents and none is legally separated. In terms of year level in college, 192 (64%) of them are in 3rd year level

while 51(17%) of them are in 4th year level. Meanwhile, 39 (13%) of them are in 2nd year level and 18 (6%) of the respondents are in 1st year level.

2. How do the respondents assess the factors affecting online classes among Entrepreneurship students of Quezon City University during the pandemic era in terms of the following aspects:
   - Learning Factor;
   - Physical Factor;
   - Emotional and Social Factor; and
   - Environmental Factor.

In terms of learning factors, the overall weighted mean is 3.83 and with verbal interpretation of agree. the mean of 4.06 computed for speed, quality, and the cost of internet hinder the proper delivery of study materials to meet deadlines, while students tend to multi-task playing computer games, sending message, and using Facebook during online classes gets a lowest weighted mean of 3.45 with verbal interpretation of somewhat agree.

In terms of physical factors, the overall weighted mean is 4.04 with verbal interpretation of agree. A mean of 4.40 is garnered from episodes of headache, dizziness, or migraine due to long exposure to laptop and other gadgets, while weight gain due to stress eating since the online classes was implemented indicator gets a lowest weighted mean of 3.67 with verbal interpretation of agree.

In terms of emotional and social factors, the overall weighted mean is 3.98 and verbal interpretation of agree. A mean of 4.44 is computed from feeling anxious meeting deadlines especially when there is poor internet connection, while social disconnection from classmate and friends garners the lowest weighted mean of 3.77 with verbal interpretation of agree.

In terms of environmental factors, the overall weighted mean is 4.12 with verbal interpretation of agree. A mean of 4.48 emanates from communication barriers particularly noise from neighbors, dogs, rooster, loud music, and lighting are predominant distraction during online classes while transferring from to one place to another to attend the online classes conveniently is the lowest weighted mean of 3.90 with verbal interpretation of agree.

3. Is there a significant difference on the respondents' assessment on the factors affecting online classes among Entrepreneurship students of Quezon City University during the pandemic era in terms of the above mentioned aspect when they are grouped according to the respondents' profile:

In terms of age, there is a significant difference among the following factors: learning factors with F-value of 378.386, physical factors with F-value of 284.760, emotional and social factors with F-value of 241.419 and environmental factors with F-value of 293.845 with the decision of rejecting the hypothesis. In terms of gender, there is a significant difference among the following factors: learning factors with F-value of 338.823, physical factors with F-value of 210.485, emotional and social factors with F-value of 207.182 and environmental factors with F-value of 168.634 with the decision of rejecting the hypothesis. In terms of civil status, there is a significant difference among the following factors: learning factors with F-value of 64.650, physical factors with F-value of 93.009, emotional and social factors with F-value of 76.224 and environmental factors with F-value of 85.392 with the decision of rejecting of the hypothesis. In terms of college year level, there is a significant difference of the following factors: learning factors with F-value of 296.342, physical factors with F-value of 216.037, emotional and social factors with F-value of 190.767 and environmental factors with F-value of 203.932 with the decision of rejecting hypothesis.

Table 1. Summary Table of the Respondents of the study

Profile of Respondents		**Frequency**	**Percentage**
Age	17 - 18 years old	4	1.3
	19 - 20 years old	57	19.0

	21 - 22 years old	169	56.3
	23 - 24 years old	37	12.3
	25 years old - and above	33	11.0
Gender	Male	73	1.3
	Female	213	19.0
	Member of LGBT	14	56.3
Civil Status	Single	282	94.0
	Married	15	5.0
	Solo Parent	3	1.0
	Legally Separated	0	0
Year Level in College	1st year level	18	6.0
	2nd year level	39	13.0
	3rd year level	192	64.0
	4th year level	51	17.0

Table 2. Summary Factors affecting Online Classes among Entrepreneurship students' of Quezon City University during the Pandemic Era

Factor Affecting Online Classes	**Weighted Mean**	**Verbal Interpretation**
Learning Factors	3.83	Agree
Physical Factors	4.04	Agree
Emotional and Social Factors	3.98	Agree
Environmental Factors	4.12	Agree

Table 3. Summary of the Significant difference in the respondents' assessment on the Factors affecting online classes among Entrepreneurship students' of Quezon City University during the pandemic era

Factors	**Profile of Respondents**	**Decision**	**Remarks**
Learning Factors Physical Factors Emotional and Social Factors Environmental Factors	Age	Reject Ho	Significant
	Gender	Reject Ho	Significant
	Civil Status	Reject Ho	Significant
	Year Level in College	Reject Ho	Significant

Conclusion and Recommendation

Conclusion

Based on the results presented on this study, the researchers conclude the following:

- As regards to the profile of the respondents, the researchers find out that most of the respondents come from the 3rd year level with a total population of 192 or 64% while most of their ages range from 21-22 years old with a population of 169 or 53.3 of the are single.
- The following identified indicators such as students tend to multi-task playing computer games, sending message, and using Facebook during online classes, weight gain due to stress eating since the online classes was implemented, Social disconnection from classmate and friends indicator and transferring from to one place to another to attend the online classes conveniently get the lowest score as rated by the respondents. Therefore, this indicators need to be addressed for further improvements.
- With regardless to the profile of the respondents, the researchers find out that there is a significant difference as to the result of the assessment of the factors affecting online classes among entrepreneurship students' of Quezon City University (QCU) during pandemic era.

Recommendations

- The respondents population of the study must be equal in terms of college year level, and gender to avoid biased results.
- Give attention to the lowest point of the study to make sure that the learning outcomes of the students are in line with the course syllabuses as well as the activities given to avoid any inconvenience and stress.
- As activities aligned with the subject syllabuses are provided, compensate with the time allotted given to the students that balance activity for both synchronous and asynchronous to ensure the school work balance and lessen the stress level of the students .
- The cooperation of the entire households is really important in today's virtual learning at home to balance the school work and household chores.
- It is important for all HEIs to prepare for possible crises to come in the future. This results of this current study will provide useful insights to design the effectively online classes by considering all the factors impacting students' learning.
- Further research studies can expand the scope of this study since most studies have examined the impacts as well as the suggestions of incorporating with and gauge responses.

Acknowledgement

The researchers would like to thank the following: The Dean & Faculty of the Entrepreneurship Department, Statistician, Students and Grammarian. To God Almighty, for bestowing them wisdom. Glory to God;
To the respondents, for sparing value time to accomplish questionnaires for the completion of this study.

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Upscaling Music and Arts Education through Exploration of Opportunities from Isla Kapispisan Resources

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Abstract - This paper presents the musical instruments and crafts designed and improvised from the empty shells of shellfish that are available in Isla Kapispisan (I.K.). The data and information about the available shellfish in I.K. were gathered from the one-on-one interviews and survey with island inhabitants in Barangay Pinamuk-an, New Washington, Aklan. This study aimed to uphold music and arts education in times of crisis and even in post-COVID situation. It was intended to design musical instruments and crafts from waste materials found in I.K., provide instructional materials for the designed and created items and preserve these designs and materials for future reference. The improvised musical instruments and crafts were designed and created be used as instructional materials for music and the arts education of the College of Teacher Education in Aklan State University (ASU), New Washigton, Aklan. Four musical instruments were improvised from the shells of litub (Cerastoderma edule), tuway (Anadontia sp.), talaba (Crassostrea sp.) as shakers/chimes and tahong (Perna viridis) as castanets. Five crafts were also created from various shells as assemblage, collage and souvenir items. The utilization of these materials into crafts and musical instruments can not only help in reduction and management of seafood waste in the locality; but, can also provide alternative ways of teaching and creating an environment for remote learning and help promote the mental well-being of people involved as well.

Keywords - Music and the Arts, Isla Kapispisan, Education, Shellfish, Waste Management

Introduction

The College of Teacher Education of the Aklan State University in New Washington Campus offers a number of degree programs including the Bachelor of Culture and Arts. With its vision to be a leader in teacher education or universal human development, the College has to adapt new strategies and mechanisms in order to continue its efforts in bringing music and arts education to its students despite the uncertainty brought by the COVID-19 pandemic.

The COVID-19 pandemic has introduced the new normal wherein everyone is left no choice, including learning institutions, but to cope with the demands of this new norm in the society. To facilitate and uphold learning and appreciation of music and arts education, the College has to adapt new strategies in teaching the course. For students to learn and appreciate music and the arts, teachers mentor them by direct demonstration and evaluation. Migration to online learning is also difficult in New Washington, Aklan and immediate vicinity due to interconnectivity issues and digital divide.

While it is obvious that teaching and learning will be different in post-COVID scenario, the College remains committed to continually provide rich and wide-ranging approaches to its students through quality and relevant instructions. Music and arts have etched a significant function in these trying times. Recent news features being circulated online pointed out that music and arts giving people means to survive in this crisis in terms of financial and mental well-being (Liptak, 2020; Netter, 2020, SEADAE, 2020).

Isla Kapispisan (I.K.) is a mangrove forest and has diverse aquatic resource wherein inhabitants of the island benefit from in terms of their daily sustenance. As a consequence, mounts of shells like oysters and mussels among others are found in the island. Waste management is, therefore, becoming a pressing concern in the area.

The estimated volume of waste from shellfish is not ascertained. As of 2017, empty shells from shellfish contribute to more than seven million tons of discarded waste every year by the seafood industry (Cimons, 2017). Also, waste from shells are considered as municipal solid wastes (MSW) and while they are usually derived from restaurants, they are categorized as kitchen waste from the household (Chilakala et.al, 2019). According to the National Solid Waste Management Status Report for 2008-2018 of the Environment Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR), the residential wastes account for the bulk of MSW at 57.6% for the period 2008 to 2013. The report further states that the waste generation rate in municipalities outside Metro Manila is 0.10 kg/capita/day and the mean capita waste generate rate in the Philippines is 0.40kg in 2010. The report projected that in 2020, the country would have 18.05 million tons of MSW.

Efforts to reduce shellfish wastes include recycling through carbonation process (Chilakala et.al, 2019) and incorporation to cement and brick production (Binag, 2018; Cimons, 2017) among others. Studies relating to knowing the calcium content of these waste shells for calcium-containing drug products (Palma et al., 2017). Potential application of seafood empty shells was studied by Jovic et al. (2019) which include possible uses of these wastes as soil conditioners, catalysts, adsorbents, artificial bones, fillers, bactericidal agents among others. Moreover, Hellen et al. (2019) explored the use of oyster shells as value-added product in the form of artificial stone.

While these initiatives are being studied across the globe and disseminated in various publications, utilization of seafood shell wastes in the province of Aklan is yet to be explored. Reduction of at least five percent of these shellfish waste is a great contribution to the waste management efforts of the country.

This study is grounded on the conceptual framework adapted from Fleming (2017) with slight modification. It shows that the interrelationship between education, economy and culture and that the development of each aspect of the society is a continuing cycle. Education plays a major role in promoting culture, music and the arts included, as well as in contributing to the economy.

Education is essential in the development of the cycle of production and dissemination of artistic goods and services (Sigdel, 2017) as it continues to provide an avenue for unsullied talents and artists to express creativity and a source of livelihood (Samodio, 2017), thereby contributing to the economy positively.

Generally, this study aims to uphold music and arts education in times of crisis and even in post-COVID situation. Specifically, this paper intends to do the following:

- Design musical instruments and crafts from waste materials found in I.K.
- Provide printed instructional materials for the utilization of designed and created items
- Preserve these designs and materials for future reference

However, this study is limited only to the designing and production of improvised musical instruments and crafts from waste materials found in I.K. as well as to the development of instructional materials for the utilization of these designs as well as for the preservation of these designs and materials for future reference. The economic contribution of these produced materials is not be covered in this study.

Methodology

Data Gathering and Material Collection

This study made use of the baseline data gathered from previous study of the researcher titled "Conservation, Protection and Managerial Practices (CPMPs) and Their Influence to the Socially-Cultured Values in the Community of Isla Kapispisan (I.K.)." In particular, the data used was the list of available shellfish in the island as identified by the respondents. The list was obtained from the one-on-one interviews and field surveys with the island respondents in I.K. (Figure 2). Using the list, the researcher collected these types of empty shells in the island. Only shells that are found prevalent in the area were gathered by hand and transported to the mainland for preparation.

Material Preparation

Empty shells were cleaned and dried. They were then segregated as to be potential for improvising musical instruments and shells that were found not feasible to be made as musical instruments were made as crafts. Empty shells of shellfish have been utilized to be used as musical instruments since time immemorial, mostly using large shells like sea snails, gastropods and conch shells as trumpets or “blowing” shells (Modern Seashell Art, 2012).

Design and Creation of Musical Instruments

Dried shells that were identified as potential to be made as musical instruments were then designed and assembled. The kinds of sound that the assembled shells were studied and only those designed shells that produced the desired sounds were pursued and finalized.

Design and Creation of Crafts

Dried shells that were found not to produce sufficient sound to be heard were designed and assembled to be made as decorative items. Although there is a shell craft industry in the Philippines, this paper will highlight the artistry of Akeanon using local materials. The shell craft industry just like in Mactan, Cebu where a lot of shell craft items is sold locally in souvenir shops and exported sourced their shells from the different areas in the country like Sulu, Bicol Region, Palawan and all throughout the Visayan seas (Floren, 2003). Some techniques in the preparation of shells as shell crafts or fashion accessories are described by Floren (2003). However, this researcher relied on her professional artistry and creativity in designing and making shell crafts.

The design of the crafts created were based on the colours of the endemic species in the area as well as symbolisms that are unique in the area as described and revealed to the researcher during the collection of data.

Preparation of Instructional Materials

Instructional materials for the design and use of musical instruments are produced and described for future reference.

Results and Discussions

The improvised musical instruments from the collected empty shell from Isla Kapispisan that were designed and created include the shakers/chimes using the shells of litub (Cerastoderma edule), tuway (Anadontia sp.), talaba (Crassostrea sp.) and castanets utilizing the shells of tahong (Perna viridis). These improvised musical instruments can be further utilized as shell percussion instruments in teaching ostinato. Britannica Encyclopedia defines ostinato as a short melodic phrase repeated throughout a composition which can vary or can be transposed to a different pitch. In particular, a rhythmic ostinato is a quick and a continually repetitive rhythmic pattern.

Interested students and individuals can learn the technique on how to play the shell percussion instruments by familiarizing the different type of shell instruments, the sound it makes, the shape it forms and how it is used. Table 1 summarizes such information as additional reference. Simple rhythms using these improvised shell percussion instruments can also be developed and they can also be used as accompaniment to songs.

Table 1. The type, sound, shape and how the improvised shell percussion instruments can be used

Kind of Shell	Type of Instrument	Sound	Shape	How to Use
Litub 1	Shaker	High	Rounded Fan shape/ Organic shape	By shaking
Talaba/Taeaba	Shaker/ chime	Moderately high	Organic shape	By shaking/ striking
Tuway	Shaker	Low	Rounded Fan shape/ Organic shape	By shaking
Tahong	Castanets	High	Organic shape	By shaking, tapping,

*Organic shape is defined as curved in appearance often which is the same as those found in nature like animals, plants and rocks among others (Ontavilla, 2012).

Moreover, shell crafts such as decorative shells assemblage, collage and souvenir items were designed and created out of shells that were found not be good materials for a musical instrument. Tahong (Perna viridis) shell assemblage were assembled to form shapes of shrimp, crab, bird and fish representing the diverse fishery resource in I.K. Tahong shells have become a common household waste as a fish substitute and they end up in landfills and coastal areas like I.K. Hence, it is equally important to find ways how to manage the waste sustainably and making it as household decor is one creative approach. In addition, a collage made of small kapis-kapis and abahong shells were assembled resembling a fish and a seagrass and mounted on a board facing a viewer which symbolizes a positive outlook embracing the challenges of pandemic and beyond with resilient mindset.

Assorted shells including tahong, punaw, bagungon and tikhan were used to form a collage resembling the footwalk found in IK that provides a place for migratory birds when looking for food as the footwalk is near the mangrove areas. This artwork represents the natural ecosystem in the island. The footwalk represented by punaw shells is a symbolism that positive interventions are needed to maintain the ecosystem.

Souvenir items like a ballpen holder and a table décor were also made from tahong and paros shells as well as talaba. These items were hand painted to be bright and colourful to provide aesthetic value. The richness of the colours used symbolize the immense diversity of I.K.

Figure 1. Shell crafts designed and created from empty shells collected from Isla Kapispisan. (a) Decorative shell assemblage from tahong shells; (b) Kapis-kapis and abahong shell collage; (c) Assorted shell collage; (d) Souvenir items: ballpen holder and table décor

Conclusion and Recommendations

Shellfish waste in the locality can have better use other than ending in garbage areas or coastal lands. Music and the arts is one cultural dimension that shellfish waste can have an important contribution, thereby, continually taking part in the development of education and economy of the community. Shellfish waste in this study were designed and converted into musical instruments and crafts than can positively enhance appreciation of music and the arts as a culture, as a field of study and as a source of livelihood; thereby scaling up the academic mindset to continue in finding innovative ways to teach and learn about music and the arts and their significant role in building and promoting the country's economy and culture.

Further developments of musical instruments and shell crafts aside from shakers and assemblage can be explored using other shellfish waste available in I.K. or in immediate vicinity like Kalibo where local restaurants are serving a lot of shellfish menu. Acceptability of the musical instruments should also be ascertained in similar studies.

Marketing and business study for potential saleable items from shellfish waste can also be pursued as a basis for economic feasibility of this endeavour.

Moreover, staging a concert using shells instruments and an exhibit of artworks and crafts from shells are recommended to showcase the outputs of the study. Instructional materials developed should be also subjected to evaluation by a panel of experts (IM committee) before utilization.

Acknowledgement

The author wishes to thank the administration of Aklan State University for the continued support and the Dalida family for the inspiration and encouragement.

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Text Lingo in the Social Media Posts of BEED Students: Basis for Devising a Learning Packet

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Abstract - This study was undertaken to determine the BEED students' extent of usage and common reasons of using text lingo in the social media posts, specifically Facebook. The respondents were the 41 purposively chosen BEED students of Iloilo Science and Technology University Miagao Campus for the Second Semester of the Academic Year 2020-2021. The research design used was a mixed-method employing quantitative and qualitative approaches. The quantitative approach was employed to determine the respondents' extent of usage, using mean and standard deviation for descriptive analysis, and t-test for inferential data analysis. The qualitative approach on the other hand, was used to identify common reasons of using text lingo through Focus Group Discussion conducted via Google Meet. The result of the study revealed that as a whole, BEED students had "moderate" usage of text lingo. However, when classified as to sex, males had "moderate" usage while the females had "high" usage. The study further revealed that there was no significant difference in the extent of text lingo usage as to sex. The reasons why students used text lingo in their social media posts is that it is commonly used, convenient and not time consuming. Based on this result, it may be concluded that respondents were aware of text lingo, yet they seldom use it. With that, a Learning Packet was developed to be used in Writing and Communication subject for students to be more aware of the appropriate use of language, specifically text lingos.

Keywords - Text Lingo, Social Media Posts, Lived Experiences, Word Frequency, Learning Packet

Introduction

According to Hughes (2018), "The Gen Z's attention spans are getting shorter as well, explaining their preference for video and images rather than text. They are the ultimate consumers of snack media. They communicate in bite sizes. Punchy headlines or razor-sharp texts resonate much better than lengthy chunks of words or long-winded passages." In this case, it proves that Gen Z's attention span highly affects the way they express their selves, hence the main reason as well why they prefer to use text lingo. Text lingo refers to the language used in texting; one of the prevalent is the use of text slang. Texting slang involves both symbols and special abbreviations that mean certain things, e.g., ABT- means about and B4- means before.

However, texting slang goes beyond in text messaging. Some also unconsciously used it in formal writing. "Because of the dramatic changes in writing that have resulted since the advent of the Internet and mobile devices, the lines between formal writing and casual writing have blurred," (Parker, 2010). "Formal writing is written for an audience you do not know on a personal level. It is often the main style in academic writing (unless otherwise noted) and is more complex than informal writing. Formal writing is serious," (Formal vs. Informal, 2020). "For example, when writing an email to a friend or posting to a social networking site, it is acceptable to use informal writing. However, in other cases, such as when writing a business report, an email to a boss, or a thesis, the writing style must be more formal. Thus, it is important to identify your audience and the appropriate style of writing to use by keeping in mind what you are writing and to whom," (Parker, 2010).

According to Azis et.al (2013), students sometimes confuse the lines between formal English and the very informal SMS language. This is thought to be causing them to make a lot of spelling and grammatical errors in their assignments and tests, and makes it hard for teachers to distinguish what they are trying to say.

Hence, the researchers deemed it necessary to conduct this study and create a learning packet that will serves as a guide for students as when and how they are going to use text lingo.

Methodology

Research Method

Mixed research method was used in this study. According to Johnson et al. (2007), mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e. g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. This research design was appropriate for the study since it aimed to gather data about the extent of usage of text lingo in the social media posts of BEED students of Iloilo Science and Technology University Miagao Campus. The study employed both the quantitative and qualitative method.

Respondents/Subjects

The purposively selected respondents/subjects were the 41 Third Year Bachelor of Elementary Education students of Iloilo Science and Technology University Miagao Campus enrolled in the second semester of Academic Year 2020-2021.

Table 1
Profile of the Subjects

Variables		Frequency	Percentage
Sex			
	Male	6	15%
	Female	35	85%
	Total	41	100%

Table 1 presents the profile of the subjects classified according to sex. The data shows that out of forty-one (41) students using text lingo in their social media posts, (6) or 15 percent are male and thirty-five (35) or 85 percent are female. Moreover, the data revealed that there are more female than male subjects.

Instrumentation

The instrument used in this study was a researcher-made questionnaire having two parts. The first part contains the personal information of the students. The second part contains the guide questions for the Focus Group Discussion (FGD).

Data Gathering Procedures

The study was classified into three Phases:

Phase 1 Quantitative Processes

First, the researchers requested a permit to conduct the study that was secured from the Campus Administrator. Second, the researchers prepared a letter to the Campus Registrar requesting for a complete list of Third Year BEED students enrolled in the second semester of AY 2020-2021. Third, the researchers added the students in their Facebook account. Fourth, each of the researchers took a screenshot of the subjects' Facebook posts starting February 1 until February 28, 2021. Lastly, the researchers compile and secure the screenshots of the Facebook posts of BEED students.

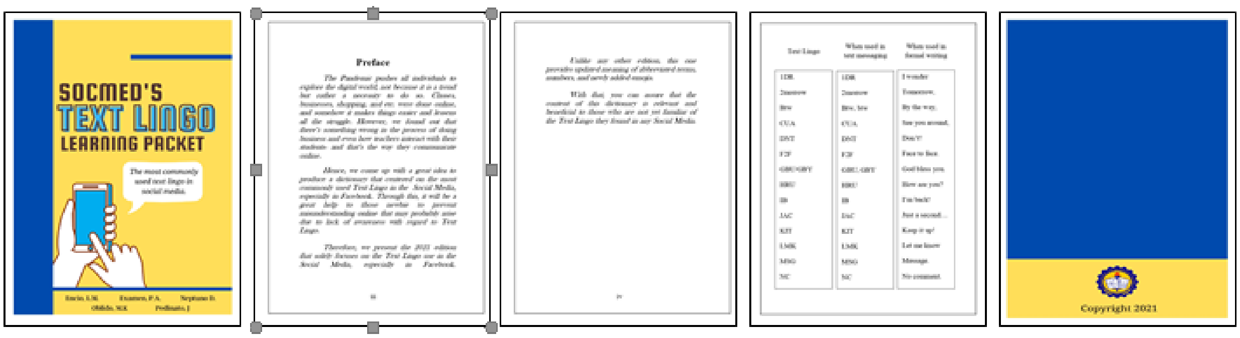
Phase 2 Qualitative Processes

First, the researchers prepared four-item Focus Group Discussion's (FGDs) questions. Second, the researchers randomly selected 10 BEED third year students out of 41 respondents to join the FGD. Third, the researchers conducted FGD on March 20, 2021 via Google meet. During the FGD, the researchers asked permission from the respondents to record the discussion and the following procedures were done: Prayer, Introduction of the researchers, Presentation of the purpose of the FGD and ground rules. Fourth, the researchers pledged to keep all the gathered data confidential, while the respondents pledged to answer all the questions honestly. Fifth, the researchers asked the respondents of the four-item FGD's questions alphabetically. Lastly, the FGD was recorded and transcribed.

Phase 3 The Development of the Learning Packet

First, the researchers gathered all the emojis and text lingo used by their subjects in their Facebook posts. Second, the researchers categorized those emojis alphabetically. Third, the researchers encoded those emojis using Microsoft word. Fourth, the researchers worked on designing the front and back page, editing the preface, acknowledgement, and its content. The content contains all the commonly used text lingo, wherein it shows how the text lingo must be used in two ways: When it is used in text messaging and when it is used in formal writing. Fifth, the researchers submitted the soft copy to our adviser for proofreading. Lastly, the researchers did the final editing and converted it into pdf.

Learning Packet



Data Processing Techniques

The data gathered were tallied, tabulated, and subjected to statistical computation. The following are the statistical tools employed in analyzing the data:

For descriptive data, mean, and standard deviation were used.

A formula was utilized to determine the extent of usage of text lingo post:

Extent of usage of text lingo = <u>total number of posts with text lingo</u> x 100
divide the total number of posts

Mean (μ) was employed in describing the extent of usage of text lingo of the subjects when grouped according to sex.

Standard deviation (σ) was used to determine the homogeneity or heterogeneity of the dispersion.

The scale utilized for the classification of text lingo usage is as follows:

Scale	Description
81 - 100	Very High Usage
61 - 80	High Usage
41 – 60	Moderate Usage
21 – 40	Low Usage
0 – 20	Very Low Usage

For inferential data analysis, t-test was used particularly in finding out if there was a significant difference in the extent of usage of text lingo in social media posts of the subjects when grouped according to sex. The level of significance is set at 0.05 alpha level. The data was processed through Social Package for Social Sciences version 20.

For the Focus Group Discussion, thematic analysis was used to analyze the transcript.

Results and Discussions

Descriptive Data Analysis

Table 2

Contingency Table for Identified Variables and Level of Using Text Lingo

Variables		Level of Text Lingo Usage									
		5		4		3		2		1	
		f	%	f	%	f	%	f	%	f	%
Sex											
	Male	0	0	3	7.3%	1	2.4%	0	0	2	4.9%
	Female	11	26.8%	7	17.1%	9	22.0%	6	14.6%	2	4.9%

Table 2 shows the contingency table for identified variables and level of using text lingo. Out of forty-one (41) students, eleven (11) or 26 percent of female subjects had a “Very high” text lingo usage. On the other hand, three (3) or 7.3% of male subjects had “High” text lingo usage and seven (7) or 17.1 percent of female subjects had “High” text lingo usage. Meanwhile, one (1) or 2.4 percent of male subjects had “Moderate” text lingo usage and nine (9) or 22.0 percent of female subjects had “Moderate” text lingo usage. While, six (6) or 14.6 percent of female subjects had “Low” text lingo usage. Thus, both male and female subjects had two (2) or 4.9 percent “Very low” text lingo usage.

Table 3

Extent of Text Lingo of BEED Students

Variables		*M(SD)*	*Description*
Sex			
	Male	49.17(26.51)	Moderate
	Female	61.40(27.57)	High
	As a whole	59.61(27.41)	Moderate

Table 3 shows the extent of Text Lingo usage of BEED students when grouped according to sex and when taken as a whole. The male subjects had the mean percentage of 49.17 with a standard deviation of 26.51 described as “Moderate” users of Text Lingo. On the other hand, female subjects had the mean percentage of 61. 40 with a standard deviation of 27.57 described as “High” users of Text Lingo. Thus, when taken as a whole, BEED students had the mean percentage of 59.61 with a standard deviation of

27.41 described as "Moderate." This finding is supported by the result of the study of Astodello (2016) which states that text lingo in the social media post of the teenagers has an effect among students as they engage more in learning language unconsciously as in a day-to-day communication.

Inferential Data Analysis

Table 4
Differences in text lingo usage when the subjects are classified according to sex

Variables	*M*	*df*	*t*	*p*
Sex				
Male	49.17			
		7	-1.038	0.334
Female	61.40			

Table 4 presents that t-test was used to determine the differences in the text lingo usage when the subjects were classified according to sex. The statistical computation shows that the p-value is 0.334 which is greater than the critical value 0.05. Therefore, there is no significant difference in the extent of usage of text lingo in the social media posts of BEED students when classified according to sex. Therefore the null hypothesis which states that there is no significant difference in the extent of usage of text lingo in the social media posts when classified according to sex is not rejected.

Methodology

Focus Group Discussion

The FGD was conducted on March 20, 2021 via Google meet. It consisted of 10 randomly selected BEED Third Year Students. The FGD was recorded on laptop and the discussion lasted for 60 minutes. The recorded video was transcribed and the transcript was used in the data analysis. An FGD guide was created for the student focus group session. The discussion focused around the text lingo that they usually used, where did they get those words, who influenced them, and why do they use text lingo in their posts. Moreover, this guide served as the blueprint of the focus group session. Furthermore, instead of using their actual name we used code for confidentiality.

Thematic Analysis

This section of the study presents the findings from the focus group discussions in the form of a summary of what the respondents said in response to specific questions. The pieces of information in this section present the researchers' interpretation based upon: (1) notes made during the focus group discussion, (2) a review of the video recording, and (3) a content analysis of the typed transcripts from the three meetings.

For the first part, it elaborates the answer of the respondents to the question, "What text lingo do you usually use? Can you give us at least 10 examples?"

Among the forty-seven (47) Text lingo that we had gathered from our respondents, BTW had the highest number of users with a total of eight participants. It was followed by FYI, LOL, and NVM with a total of six users each. Subsequently, ASAP, ILY, and PLS had a total of five users each; SKL with a total of four users; BRB, IMY, OTW, OMG, and TBH had a total of 3 users each; IDK, LMAO, LT, NOOB, SML, and TY had a total of two users each; and ATM, CYL, FTW, G, GBU, GBY, HOW R U, IKR, K, L8r, MOOD RN, NP, OFC, OP, OOTD, POV, PPL, q, RMSC, RT, SLR, SS, TC, TNX, TXT, TYL, TYT, and WER R U only had 1 user each.

For the second part, the respondents were asked where they got the text lingo they used.

P2, P5, P8, P9, P10 and P11 said that they learned text lingo only through Facebook. While, P4 and P7 said they learned it through Facebook and Instagram. Then, P3 said she learned it because it is a trend and P6 stated that he learned text lingo through the collaboration of Facebook, Instagram and because it is a trend.

For the third part, the respondents were asked who influenced them to use text lingo.
P2, P4, P5, P7, P8, P10 and P11 said that their peers influenced them to use text lingo. While according to P3 and P7, it was not only their peers who influenced them to use text lingo, but also their chat mate. Then P6 stated that the persons who influenced him to use text lingo were his peers, chat mate, and family.
The last part explained the reasons why the respondents used text lingo in their Facebook posts and if their Facebook friend can understand the text lingo they used.

Illustrative quotations from the focus group discussion

> "I used text lingo in my post because, aside from being easy and not time-consuming, it is commonly used nowadays. Yes, probably they can understand it because it is common and you can encounter it anywhere in the social media platform (P4)."

> "I use text lingo because for me it is easy and fast way to type words and I think some of my fb friends could also understand since we are all in the trend and we are in gen Z. But if I am communicating with my relatives and teachers I prefer to type complete words for them to understand what my message is since not all of them can understand some text lingo (P6)."

> "I use text lingo because it is common and also to go along with what's new. Further being a trend is the main reason which persuaded me to use it. Yes, they can understand it because it is not just me who is using text lingo in Facebook and I guess they encountered most of it already from their friends and other Facebook users as well. Anyway, even if they don't understand it, it's just a matter of time before they will find out what exactly does it mean because social media, especially Facebook, is a home to all FAQ's (P7)."

Summary of Findings, Conclusion and Recommendations

Summary of Findings

Forty-one (41) BEED students used text lingo in their social media post, wherein six (6) or 15 percent are male and thirty-five (35) or 85 percent are female. Moreover, there are more female than male subjects. Eleven (11) or 26 percent of female subjects had a "very high usage" of text lingo. The level of text lingo of BEED students when grouped according to sex and when taken as a whole was "moderate" with the mean of 59.61 and a standard deviation of 27.41. There was no significant difference in the extent of usage of text lingo in the social media posts when classified according to sex. Students used text lingo in their social media posts for the reason that they find it as a trend, convenient to use, not time consuming, and easily shortens messages. A Learning Packet which contains text lingo was developed. This will serve as a guide on how to use text lingo in text messaging and in formal writing.

Conclusions

The respondents are not frequent users of text lingo. The females are more frequent users of text lingo than the males. Sex has no bearing in extent of text lingo usage of the respondents. Respondents want to be "in" with the social media trend. This learning packet will serve as a reference for students and teachers about text lingo.

Recommendations

Commission on Higher Education (CHED) and Department of Education (DepEd) may suggest the utilization of the learning packet as a resource material for academic paper. Teachers may utilize the learning packet as resource materials for teaching Technical Writing and communication subjects. They may make use of their knowledge on text lingo as an engagement activity in their teaching since it is the language used by the students. Teacher Education students may use the learning packet as a resource material when writing academic papers. This may also guide then in choosing appropriate language in a certain communicative situation. Future researchers may further utilize the findings of this study as baseline data for future research endeavors in text lingo and language studies.

Acknowledgement

The completion of this research paper would not be possible without the whole-hearted assistance of the persons who shared their valuable involvement, expertise, and inspiration towards the improvement of the study. Their contributions were appreciatively acknowledged.

The researchers would like to extend their sincere expression of gratitude to the following persons who significantly contributed to the success of this study.

The Almighty God, the source of all Wisdom, For His Providential Presence, Guidance, and Grace all throughout the conduct of this academic endeavour;

Dr. Sandra T. Examen, Campus Administrator, for the approval to conduct the study;

Dr. Herminia N. Falsario, Research Paper Adviser, for her guidance, trust, never-ending support, for her valuable time in analyzing, editing, and checking the research paper;

Dr. Jureca F. Nacional, Subject-teacher of Language Research, for imparting her pieces of advice, valuable comments, suggestions, and ideas for the improvement of the study;

Dr. Ma. Salome R. Magbanua, the Chairman, for generously sharing her concepts and ideas for the refinement of the research paper;

Dr. Ma. Maja Jade N. Perez, the Grammarian, for validating and for sharing her expertise and valuable suggestions to enhance the research paper.

Prof. Ricky Andresito P. Naciongayo, the statistician, for his accommodating stance, expertise, and commentaries towards the completion of the study;

Dr. Kathleen D. Subong, for her valuable support during the conduct of the study;

BEED Third Year Education Students, Gov. Karen F. Bellen for imparting their time, cooperation, and willingness during the conduct of the study;

The researcher's guardians and parents, for financial and moral support all throughout this academic journey;

And, all other persons who helped in any ways, for the kind support. This research paper would not be possible without your utmost assistance.

Thank you very much.

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Gender Representation of Female and Male in Philippine K-12 Learners Materials in Kindergarten

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Abstract - This paper aims to find out the female and male illustrations in Kindergarten textbooks in the Philippines. It examined the texts and pictures and occupational roles and activities of females and males. Content analysis was used, frequencies of male and female for different illustrations were utilized. Findings of the study from the content analysis revealed that kindergarten textbooks in the Philippines perpetuate gender biases. Thus, policy and curriculum makers and instructional materials committees must consider special attention to the pedagogical implications on education to pursue gender equality.

Keywords - Gender Bias, Stereotyping, Gender Schema

Introduction

Textbooks are the most effective tools which encourage children to develop attitudes and preferences in their later life. These are one of the first forms of media to demonstrate which educational "norms" are intended to be transmitted in the classroom (Sabir, 2008). Hence, teachers most use textbooks as core means of teaching in 70-95% of classroom time (Recaña, 2019). Textbooks have economic and ideological implications. It has long been understood that textbooks are a fundamental vehicle of socialization, conveying knowledge and values (Carole Brugeilles& Sylvie Cromer, 2009).

What is seen and read in textbooks can be immolated by children or anyone who reads it, for it formed a gender schema to the reader. A biased representation of females and males can give students a sense of what is typical for women and men in our society. In other words, the content of the textbooks helps reinforce gender as a social division and perpetuate inequalities between men and women. Experts and authorities in education also believe that every learner's health and mental, social, cultural, and scientific growth depends on a balanced and appropriate system of education (Gharbavi & Mousavi, 2012).

School as a place where both girls and boys interact with each other and where instructional materials are readily available should be an avenue to teach well the value of both sexes in the society and the equal roles they play together on political, economic, social, and cultural aspects as citizens of the country. In the World Economic Forum report, the Philippines remains one of the most gender-equal political and economic leadership opportunities for men and women. It was the only Asian country in the top 10; the report noted that Manila needs to close the gender gap in its health and survival category. Not only in those mentioned areas that is need to close the gender gap and issues but in all sides for the complete attainment of gender equality.

Nevertheless, recent research studies across nations continue to claim the stereotypical and underrepresentation of women and girls in children's books (Ullah & Skelton 2012; Skelton, 2011). Clark and Mahoney (2004), Clark and Keller (2005) in the United States of America; Skelton (1997; 2006; 2011) in the United Kingdom; Eilard, (2004) in Sweden; Jassey (1998) in Japan; Chen and Chen (2002), Yi (2002), Guo and Zhao (2002) in China, Miroiu (2004) in Romania; Ellis (2002) in West Bengal, Alrabaa (1985) in Syria, Ahmed (2006) in India; Mirza (2004), Ullah (2007; 2013; 2014; 2016) and Khurshid et., al (2010) in Pakistan concluded that school materials represent males and females in a highly gender-stereotypical way in the private as well as in the public domains, and in the actions, attitudes, and traits portrayed.

Based on the cited facts and studies, the researchers opt to study the gender representation of males and females in the Philippine K12 learner materials at the kindergarten level. The researchers believed that the materials used in teaching kindergarten level should be deeply analyzed to look into the gender representations that the curriculum developers are using. Kindergarten textbooks are essential instruments used in teaching and learning in schools. These are equally powerful representations of the curriculum and the pedagogical practices at all levels of education. Kindergarten textbooks like language and social studies are ideologically invested and carry gender biases. Furthermore, as researchers and part of higher education institutions, they are responsible for lessening gender inequality.

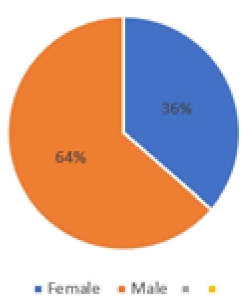
Methodology

This study is both qualitative and quantitative type of research of content analysis. Content Analysis in this study is the use of paper and pencil/ hand coding procedures. Content Analysis was elaborated by (Brugeilles and Cromer, 2009) in their manual Analyzing gender representations in school textbooks. It examined the materials, including dialogues, exercises, reading texts, captions, novel excerpts, poems, and the like. Also, (Palmquist 1998) noted that the content analysis method is advantageous in tracking down errors during the proceedings of coding compared to automated programs. A detailed content analysis was done to identify and examine the contents and the language used to show the occurrences of representation and sex-role stereotyping. The following categories were covered in the analysis: gender visibility (gender appearance in text), gender stereotyping, inequality, honorifics, sensitivity, gender illustrations, “firstness,” occupational-role representations, character attributes, and interests and lifestyles (Brugeilles and Cromer, 2009).

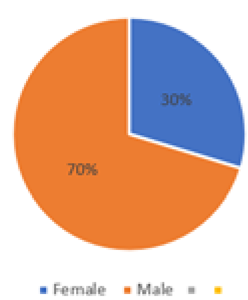
Qualitative analysis was used to categorize images into different gender roles and manifestations of gender bias categories. The theories and concepts from the Philippine Commission on Women and related researches served as guides on decoding the categories in the study, specifically the identification of occupational roles. The texts and pictures were analyzed quantitatively by examining the frequency of occurrences of males and females in reproductive, productive, and community roles/activities and the same with the gender stereotype, subordination, and marginalization.

Results and Discussions

A. Gender distribution of males and females in Philippine K to 12 learner’s materials in kindergarten along with texts and pictures.



Characters Illustrated in the Textbooks through Pictures



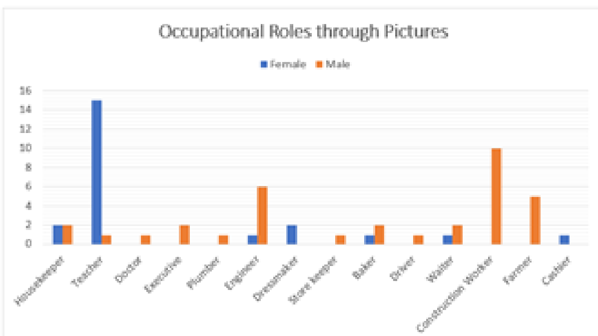
Characters Illustrated in the Textbooks through Texts

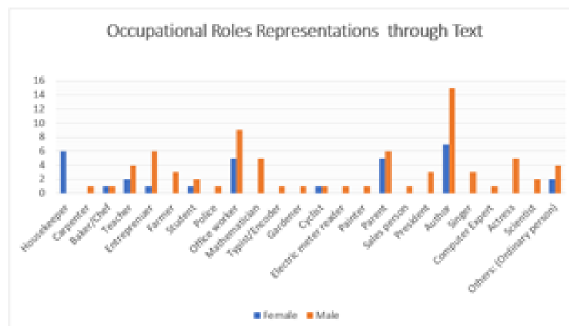
The figure shows the full illustrations of females and males through text and pictures in kindergarten textbooks. It can be observed on the figures that males outnumber females along with text and pictures. Almost half of the illustrations through texts are dominated by males. Pictures on occupational roles contribute a lot to male illustrations. Further, solving word problems illustrate various activities on male and female however they were portrayed in doing their domestic functions together, they were not equally portrayed when investigated according to the type and quality of work done.

One crucial lesson children learned in the textbook is the consistency of gendered tasks from the household to the societal levels. Through the illustrations, students unconsciously learn these roles associated with their sex, resulting in the regulation of individual behavior to conform to the cultures' definition of maleness/ masculinity and femaleness/femininity. The Gender Schema Theory explained that students learn these gender roles, activities, and attributes. These concealed messages in textbook illustrations have a powerful influence in building the student's self-concept and gender identity.

Through the textbooks, society, particularly the school, unconsciously reproduce and perpetuate gender biases and stereotypes. According to Fahim (2010), the patriarchal socialization patterns emanating from cultural norms and values are still held by textbooks' portrayals of traditional gender roles, stereotypical and binary male/ female divisions. McCabe, Fairchild, Grauerholz, Pescosolido, Tope (2011) argued that books reinforce, legitimate, and reproduce a patriarchal gender system. It had become part of the everyday socialization process, leading, therefore, to the unconscious actions of the illustrators and authors to portray stereotypical roles resulting in gender biases in kindergarten textbooks.

B. 1. Occupational Roles depicted for Male and Female in the Philippine K to 12 Learner's Materials in Kindergarten

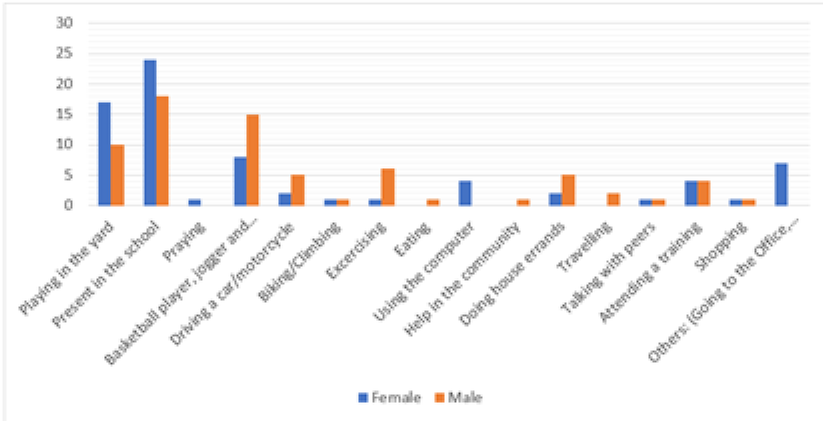




The figures above show that males dominate the occupational roles in the Kindergarten Learner's Materials in the Philippines through pictures and texts using the Content Analysis. The data means that there is an unequal representation of females and males in the textbook, and it continues to exist despite curriculum reforms, DepEd policies on GAD responsive Basic Education, Magna Carta of Women, and other related reforms. The type of occupational roles for males portrayed in the kindergarten textbooks is masculinity-oriented work (carpenter, plumber, construction worker, and the like) and primary roles which require prestige and high paid occupational roles such as doctors, executives, and the like. In contrast, female occupational roles are more nurturing and often feminine-oriented work and secondary roles. These observations are comparable to the findings in the study of (Yasin and colleagues 2012) on Malaysian textbooks where women were depicted in domestic spheres like attending her children's needs, providing them the loving care and support, roles of wives, mothers, and nurturers. Also, it was supported by the study of (Poduval and Poduval 2009) that motherhood confers upon a woman the duty of raising a child and taking the household chores.

Both males and females mainly were portrayed in their socially and culturally defined domestic functions, but still closing the gender gap must be emphasized for it shapes the mind of the readers to which role they must perform rather than they are capable of doing in their later careers they would like to pursue. A revisit on the policy in developing instructional materials or textbooks in kindergarten must be done to address gender stereotyping, which was found from this study. Equal representation of females and males along texts and pictures can be observed since closing the gender gap is a mandate in all government agencies.

B.2. Activities of Male and Female Illustrated in Kindergarten Textbook



The figure shows the activities of males and females illustrated in the kindergarten textbook. It can be noted that there is still an unequal representation of both sexes in different activities identified. Male in kindergarten textbooks present the public domain as men's prerogative since it is depicted in various activities, such as eating, traveling, and sports player, driving, and exercising. The representation of men in these activities communicates an explicit and implicit message to young children about what it means to be a male and female in Philippine kindergarten textbooks. However, it is noteworthy that there is a representation of Females in some socially constructed activities for males, such as playing in the yard, being a sports player, biking and climbing, and attending to training.

Findings are similar from past studies (i.e., Clark & Keller, 2005; Skelton, 2006; 2011; Ullah & Skelton 2012) analysis unpacked those men and women are represented in stereotypical gender roles. Men are represented in a wide variety of activities and roles traditionally considered masculine (i.e., business, driving, etc.), whereas women are dominantly depicted in house chores (cooking, cleaning, childcare, sewing, etc.) in Pakistan's kindergarten textbooks. Thus, There is an initiative to leverage women's activities found in kindergarten textbooks, yet it is still limited, and other stereotypical activities. Hence, adding more pictures and texts in kindergarten textbooks is encouraged to address this gender bias since it leaves an imprint in the mind of the students on what activities are only for males and for females.

Conclusion and Recommendations

This study examined gender representation in school kindergarten textbooks currently used in Philippine public schools. Overall research concluded that amidst the progressive gesture of the government to guarantee positive development towards the abolition of gender disparities in education, like revisions of textbooks, there were still fragments of gender biases, specifically on how sexes were illustrated in textbooks. A further conclusion of the study is that kindergarten textbooks reinforce male-dominated illustrations in occupational roles and activities. It contributes to the manifestations of gender biases in the textbook. There are no representations of other genders identified in society. Understandably, conventional gender views are challenging to change, but it is commendable that materials depicting these cultural views are being modified. Portraying both males and females in non-traditional roles is positive towards mainstreaming gender into the Basic Education Curriculum. The study, thus, recommends updates researchers, academicians, and policymakers that stereotyping and women/girls underrepresentation in textbooks in general and kindergarten textbooks in particular persists. They must consider pedagogical implications to pursue gender-responsive primary education. The data needs serious attention from curriculum developers and textbook authors so that gender stereotyping can be addressed to avoid further harm to future generations.

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Crafting a Post-Pandemic Flexible Learning System in a Higher Education Institution: An Evaluative Study

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Abstract - The 4th Industrial Revolution has ushered in an era of digitalization. Due to the COVID-19 pandemic however, the need to adapt to flexible learning systems (FLS) that utilize online resources and electronic platforms is greater than ever. In response to this need, schools have had to come up with alternative learning systems to continue delivering education remotely. However, not all student populations are well-equipped to transition to purely online-based systems especially in developing countries. The current study investigates the flexible learning system crafted in a Philippine private university without selective admission, therefore catering to students and employees with varying access to resources. The study uses an evaluation research design encompassing two phases: formative evaluation (i.e. baseline surveys used as the basis in crafting the FLS) and mid-term evaluation (i.e. satisfaction surveys, qualitative feedback after the first semester of implementation). Results show that the university was successful in crafting an FLS that is accessible to all students regardless of their resources, by using a system of instruction that delivers the same content through different modes of learning (i.e., offline, hybrid, online). Stakeholders (students and faculty) were mostly satisfied with the learning system especially in terms of the flexibility it offered them with their time and mode of learning/delivery.

Keywords - Flexible learning system; Post-pandemic education; Higher education in a developing country

Introduction

The 4th Industrial Revolution has ushered in an era of digital transitions from most existing industries and has led to the birth of many new ones. The current COVID-19 pandemic necessitates the implementation of social/physical distancing, including traditional face-to-face classes. Even if social/physical distancing were to be observed in the classroom, the risks of disease transmission still remain higher compared to the complete absence of physical groups. As a result, the need to adapt to flexible learning systems that utilize online resources and electronic platforms is greater than ever. In fact, the changes brought about to the educational system might very well stay permanently (Lockee, 2021). Fortunately, many companies and learning platforms have responded to the need for remote education during the pandemic by offering their services for free or at massively discounted rates (Li & Lalani, 2020).

Various researchers have risen to the occasion and come up with studies on how education has changed in the face of COVID-19 (Sharma & Alvi, 2021; Wang, Towey, Ng., & Gill, 2021; Cardenas, Lomeli, & Ruelas, 2022). Many other academics have also conducted studies in their own educational institutions in attempts to determine the best alternative mode of instruction to deliver. Singh. Steele, and Singh (2021) review how blended learning started, how hybrid models of education evolved, and how faculty who were not digitally-equipped eventually learned how to handle online classes. They also present how root cause analysis and SWOT analysis were utilized to determine challenges and solutions faced by teachers during the pandemic.

Keshavarz (2020) presents a model of flexible learning in which the benefits of traditional face-to-face instruction and remote learning are combined to strengthen each other's weakness. He purports that the answer to the issue of a lack of human interaction in remote learning is to implement "modified blended learning" in a "hybrid campus". This setup is characterized by students going to the campus physically a few times in a week or a month. Essentially, 50% of instruction is delivered virtually while the other 50% is delivered face-to-face.

Barrera, Jaminal, and Arcilla (2020) conducted a survey to determine faculty members' readiness to transition to flexible learning. The scope of their study included teachers from junior high school, senior high school, and the tertiary level. Their results showed that instructors were adequately equipped with electronic devices such as mobile phones, tablets, or laptops. Most of them were shown to heavily rely on mobile data however. It was recommended that they decide on a learning management system to maximize the resources available to them. Trainings and changes in curriculum were also recommended.

These studies all support how evidence-based solutions and data-driven decision making are crucial in the process by which academic institutions decide how to survive during the pandemic as well as in the post-pandemic world.

In response to the need for a massive change in mode of instruction, the university in the current study came up with "InnUVate": the Visayanian ACCESS Flexible Learning System which was crafted with the overarching goal to deliver quality education remotely using the limited resources that all involved stakeholders have. The flexible learning system was designed especially for the school's students (and even faculty members) who come from all walks of life. Majority of private schools have student populations which are mostly composed of those from the middle and upper classes. This makes it invariably easier to come up with purely online-based alternative learning systems during the pandemic.

But in a private, self-sustaining university with no selective admission and where students (and even some faculty members) come from all walks of life, developing an alternative learning system characterized by fairness and accessibility to all stakeholders is a heavy endeavour. The challenge in providing access to connectivity and resources is a universal one—rural areas have difficulty with internet connection, and in lower-income families it is not uncommon to have family members sharing gadgets (Lockee, 2021). Knowing that these circumstances are real for many students in the university, it was therefore necessary that the crafted flexible learning system met the following criteria:

- It must be able to cater to a variety of students, from who have no capacity for internet connection to those who have fast internet and electronic resources.
- Lessons in the course study guides (modules) must be cut down only to what is essential, taking into account that online students might need to share devices with siblings, and offline students will be doing purely self-taught and self-paced lessons.

Methodology

Research Approach. This study is evaluative in nature, specifically utilizing the goal-based evaluation model (GBE). GBE, also called objective attainment method, is one of the oldest methodologies used especially in educational settings and is designed to assess a program's effectiveness with specifically set goals or objectives in mind (Scriven, 1991).

Evaluation was done in two phases. Formative evaluation (Phase 1) involved deployment of baseline surveys to gather input from stakeholders that would be used to inform the crafting of the flexible learning system. Once the crafted FLS was implemented for the first semester, mid-term evaluation (Phase 2) was carried out to get feedback about the stakeholders' satisfaction with the system and to identify points for improvement.

Project Strategies. The project team started with the overall goal which was to transition to a holistic learning system that could immerse students in the skills needed in the 4th Industrial Revolution without leaving behind students who do not yet have the resources for total digitalization.

To achieve this goal, there was a consensus that the flexible learning system (FLS) to be developed must not solely be driven by the limitations brought about by COVID-19—on the contrary, it must be sustainable in the long run and its chief purpose must transcend the pandemic.

The project was implemented in stages. The first stage consisted of crafting a learning continuity plan so that the team had a definite timeline and milestones. The next stage involved collecting and analyzing baseline data (Phase 1 evaluation) that would inform the team about where the students and faculty stood in terms of their readiness to transition to a completely different learning system.

Based on the gathered data, the FLS policies and guidelines were then crafted, reviewed, and approved wherein the team took into account the concerns and recommendations raised by its stakeholders. The next stage was to provide trainings on digital literacy and LMS navigation that enabled students and faculty members to bridge the gap between their current skill set and the needed minimum skill set.

This was followed by the most essential phases, the actual deployment of the FLS. To address the challenges encountered, academic unit representatives were tasked with gathering feedback from the students in the form of a satisfaction survey (Phase 2 evaluation). Results of the satisfaction survey was once again analyzed. Recommendations based on the survey results were deliberated upon and incorporated to the FLS.

Phase 1 – Formative Evaluation (Baseline Surveys). We deployed a total of three (3) baseline surveys: one for students, one for faculty members, and one for the academic unit heads (i.e. deans). Students were asked about how well they had access to internet, devices that can connect to the internet, sites accessible to them, and their preferred learning system. Faculty members on the other hand were asked about their connectivity situation as well, capacity to utilize flexible learning tools, their level of computer literacy, and preferred mode of flexible learning. Deans were asked about what modes of delivery their colleges/departments used when the emergency quarantine was first declared, as well as materials or software in their respective units that could be used to implement flexible learning. There were also question gauging their unit's readiness to transition to flexible learning.

Phase 2 – Midterm Evaluation (Feedback/Evaluation). The midterm evaluation phase was carried out through a massive satisfaction survey for students. Aside from asking them to rate their satisfaction of the different aspects, qualitative feedback was also gathered by asking the students what part of the FLS they liked the most and what suggestions they had for improvement. A series of recommendations was then crafted based on the survey results.

Sampling. Due to the difficulties faced during the pandemic, all surveys were conducted with convenience sampling. Only students and other stakeholders with the capacity to answer online surveys were able to participate in the data gathering.

Instruments. The main data collection instrument was through the use of online survey forms. Baseline surveys utilized Google Forms as this was the most accessible and familiar to the stakeholders. However, once the FLS was in place the university had subscribed to Office 365. Surveys in the midterm evaluation phase were therefore conducted through Microsoft Forms wherein respondents had to utilize their university emails to answer the survey.

Data Analysis. Analysis was done in the form of frequency or percentage for single-choice or multiple choice survey items. For sections that required respondents to answer Likert scales, analysis was done through calculating the mean and standard deviation of each item.

Limitations. It must reiterated that all data presented in this paper comes from respondents reached through convenience sampling. Therefore, we cannot claim that it proportionally represents the sentiments and experiences of the entire university population.

Results and Discussion

The results and discussion are divided into three major portions: (1) Phase 1 formative evaluation, (2) the flexible learning system crafted from the baseline survey results in phase 1, and (3) Phase 2 midterm evaluation.

Phase 1 – Formative Evaluation
This section will discuss the results of the three baseline surveys constituting the Phase 1 evaluation of the project.

Baseline Survey for Students. The first baseline data collected were from the students. An online survey on capacity for online classes or distance learning was deployed in early April 2020 when the pandemic lockdown had just started. A total of 2,804 students voluntarily participated and answered the questions. The following figures and tables show the results of the said survey.

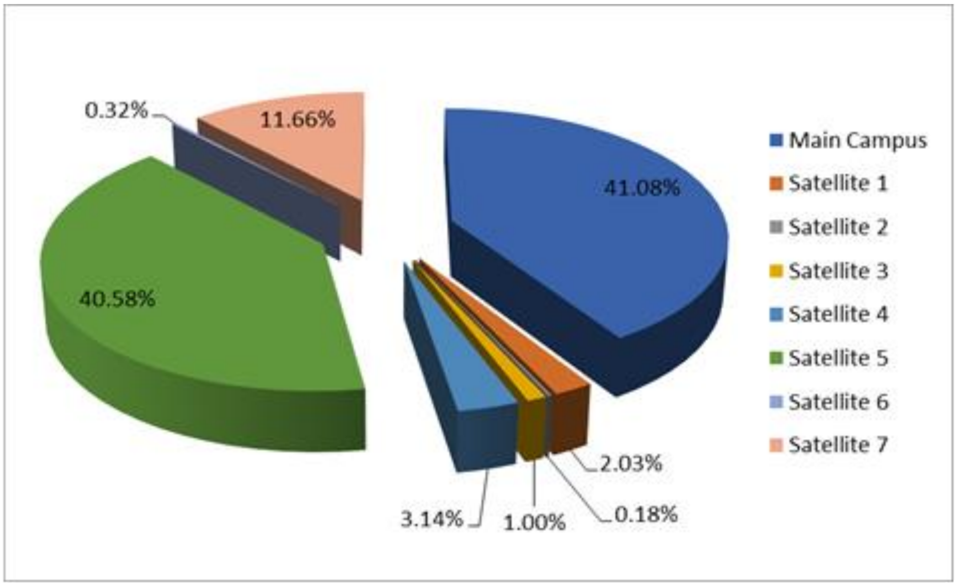

Figure 1. Distribution of student respondents in terms of campuses (N = 2,804)

Majority of respondents who answered the survey were from the main campus (f=1152, 41.08%) which is located in the middle of the city and satellite campus 5 (f=1138, 40.58%) which is also located in a nearby city. Understandably, these are students who are the most likely to have access to electronic gadgets and internet, therefore easily sending in their survey results.

Students' Accessibility to the Internet. The survey asked students to select from a checklist all devices available to them that could connect to the internet. As expected, the great majority answered their mobiles phones (97.22%). At this day and age, mobile phones are considered more of a necessity than a luxury, especially in the younger populations. In fact, all respondents (100%) from three different campuses reported that they used their mobile phones and nothing else. Students from one satellite campus in particular did not select any of the other devices as available means for them to connect to the internet.

In distance learning, the most important and useful device for both teacher and learner is arguably the laptop or a personal computer. But since desktop PCs are mostly found in libraries, internet cafes, or workstations, laptops are the more cost-effective and relatively accessible choice. The last row in Table 2 below shows the percentage of students who have access to laptops wherever they are currently residing.

Table 1. Connectivity Availability and Resources (N=2,804)

Internet, Devices, and Accessible Sites		***f***	**%**
Devices	**Cellphone**	**2726**	**97.22**
	Tablet	**63**	**2.25**
	Laptop	**247**	**8.81**
	Desktop	**120**	**4.28**
Internet	**Mobile Data**	**2325**	**82.92**

	WiFi	**656**	**23.4**
	LAN	**40**	**1.43**
Accessible Sites	**Facebook & Messenger**	**2721**	**97.04**
	Other Social Media Sites	**674**	**24.04**
	YouTube	**1081**	**38.55**
	Google (Search Engine)	**1189**	**42.4**
	Google Classroom	**477**	**17.01**
	Moodlerooms	**129**	**4.6**
	Weebly	**77**	**2.75**
	Any website on the internet	**260**	**9.27**
	E-mail Providers	**379**	**13.52**
	Others	**5**	**0.18**

As seen above, only 13.09% of students (f=367) reported that they have access to a laptop or a desktop computer. This poses a huge concern because most digital learning platforms are made to work best with a computer, not mobile phones. Additionally, phones offer limited software and flexibility in writing papers, processing spreadsheets, using software (e.g. SPSS), and others. The flexible learning system to be crafted would need to have innovative solutions to find ways around this limitation.

Consistent with the previous dataset, it is to be expected that students' major source of internet connection is mobile data (f=2325, 82.92%). Limited people can afford to get a WiFi modem, and LAN is very limited in its availability because of the need for wire connections. However, a small overall percentage still do use it to connect to the internet. Though WiFi is the most preferred source of internet connection, it was worth noting after further analysis that none of the degree programs had even a 50% rate of accessibility to WiFi connection.

In order to maximize distance learning, all students and educators must be able to access as many sites as possible. However, due to the constraints presented by mobile data this is not always expected. As expected, the most accessible sites by students across all campuses are social media sites. This must not to be interpreted as the respondents only accessing these sites because of personal choice—rather, most mobile network operators offer data packages that maximize the use of social media sites. For instance, two of the largest mobile network operators in the country, all offer free Facebook even if one does not avail of a mobile data package. Although there are indeed limitations to this (e.g. in Globe, availing of free data does not allow you to see photos or videos), it still remains to be one of the few ways that mobile users can access the internet.

The next items asked students to rate the reliability of their internet connection, their accessibility to online classes, and how likely they were to enroll in the coming semester. All items were rated on a scale of 1-7. Table 3 below shows the results:

Table 2. Status of Internet Accessibility and Likelihood of Enrollment

Criterion	M	SD	Interpretation
Reliability of Internet Connection	3.62*	1.41	Satisfactory
Accessibility of Online Classes	3.62*	1.55	Satisfactory
Likelihood of Enrolling in the Upcoming Semester	5.95**	1.55	Very High Likelihood

* Interpretation: 1.00-1.86 (Very Poor), 1.87-2.72 (Poor), 2.73-2.59 (Fair), 3.60-4.46 (Satisfactory), 4.47-5.33 (Good), 5.34-6.19 (Very Good), 6.20-7.00 (Excellent)
** Interpretation: 1.00-1.86 (Not Likely at All to Enroll), 1.87-2.72 (Very Low Likelihood), 2.73-2.59 (Slight Likelihood), 3.60-4.46 (Moderate Likelihood), 4.47-5.33 (Good Likelihood), 5.34-6.19 (Very High Likelihood to Enroll), 6.20-7.00 (Sure and Definite Enrolment)

It is worth noting that out of 2,804 students, only 89 (3.17%) reported that they had excellent internet connection and 166 (5.92%) reported that they had very good internet connection. Those who reported having good internet connection also made up a relatively small percentage of the population (f=447, 15.94%). All in all, combining these 3 groups who have satisfactory to above average quality of internet connection only comprises a quarter of the population, a small minority compared to the rest of the respondents (f=702, 25.03%).

Knowing that students are mostly equipped with mobile phones, mobile data, and fair to satisfactory internet connection, we also looked at the accessibility of online classes themselves. As a whole, students rated this as satisfactory. However, breakdown of the data actually revealed that out of eight (8) campuses, five (5) rated their accessibility as satisfactory, three (3) rated this as fair, and one (1) campus gave a rating of poor (M=2.33, SD=1.41). However, even if access to the internet and online classes are indeed limited, it does not discount the possibility of blended learning that needs to be carefully crafted so that activities and resources do not consume too much internet data.

Majority of the respondents also expressed that they were likely to enroll in the next semester. Then again, it must be noted that the respondents who were able to answer the online survey were those who had access to internet and had gadgets. Those who had gone home to far-flung provinces cannot be said to be well-represented, which is a limitation of the said survey.

Next, we asked students about their preferences in terms of class delivery and schedule. Table 4 below shows a breakdown of the results:

Table 3. Students' Preferences in Class Delivery

	f	%
Preferred Mode of Delivery		
Face-to-face	1474	52.57
Blended (Combination of face-to-face and online)	559	19.94
Modular (Take home work books & self-study)	453	16.16
Online/Distance Learning	265	9.45
Depends on the Situation	8	0.29
None	45	1.6
Preferred Class Schedule	0	
AM	1016	36.23
PM	783	27.92
Evening	423	15.09
Mix of all Three	519	18.51
Others	63	2.25

N=2,804

Understandably, very few respondents opted for online/distance learning (9.45%) and a little above half still chose face-to-face learning (52.57%). The next options would be blended learning (preferred by 19.94%) and modular (chosen by 16.16%).

If the university pushed through with face-to-face classes, the size of each class would have to be greatly reduced in order to comply with physical distancing regulations. This poses a problem in terms of availability of classrooms, schedules, and instructors. Face-to-face classes would have to be offered eventually, especially for laboratory courses but they would not be doable right when the pandemic had just started.

The most feasible options identified initially were blended learning and modular learning. For blended learning, a combination of face-to-face learning and online classes is involved. But if the university chose to push through with that, there would have to be careful rescheduling so that each class only met once a week (or every 2 weeks), and the rest of classes or schoolwork is done online. Additionally, only students who reside within the vicinity of the campus would be able to undergo this mode of instruction, unless travel restrictions are lifted or loosened at the very least.

Modular classes were seen to be the most doable in terms of resources and planning. The biggest advantage is that students would not necessarily need good internet connection and heavy-duty devices such as laptops to access websites. All they would have to do is pick-up the modules and flash drive in designated drop-off centers (or have them delivered door-to-door). Most likely, the only time they would need to go online was during major exams or to check supplemental online resources. But since major exams only take place once a month, students would not need to spend too much on mobile data. The biggest challenge in doing modular classes however would be requiring the faculty members to come up with pre-written modules for entire subjects. Modules must contain good content and worksheets or exercises that the student complies by himself/herself. If the modules are not well-thought out or structured and written well, the students' quality of learning would be compromised.

In terms of preferred class schedule, answers were mostly varied across all campuses and degree programs/courses/grade levels. A little above a third of the respondents (36.23%) said that they would prefer to take classes in the morning. However, this is nowhere near close enough to be considered a preference of the majority. Then again from a student's perspective, many have started to work in call centers to make ends meet. Other have families to attend to. This most likely contributes to the vast differences in the respondents' preference in scheduling.

Should the university push through with flexible learning and/or modular classes, scheduling will have to be different than the usual. For instance, in modular classes, most of the studying is to be accomplished by the learner at home. If there is anything to be scheduled, it would be limited to exams and the occasional major lecture. For blended learning, students would only be required to turn up to a class once a week or so. This definitely leads to more leeway in scheduling classes. As for respondents who chose evening schedules, that had to be carefully considered because during the time that enhanced community quarantine was still implemented, curfew rules were very strict.

Baseline Survey for Faculty. The second baseline survey conducted as part of the formative evaluation of the flexible learning project was directed to faculty members. The main purpose of the survey was to assess how well-capacitated the faculty currently were to conduct online classes through the necessary rise of e-Learning systems in educational institutions all over the country, to cater to the pandemic.

A total of 137 faculty members across all colleges voluntarily participated and answered the questions. So far, all colleges were represented by faculty in the survey, although the samples included here were not considered to represent the sentiments of the university constituents as whole since random sampling was not done and completion of the survey was completely voluntary. The following figure shows the breakdown of participants based on their employment status.

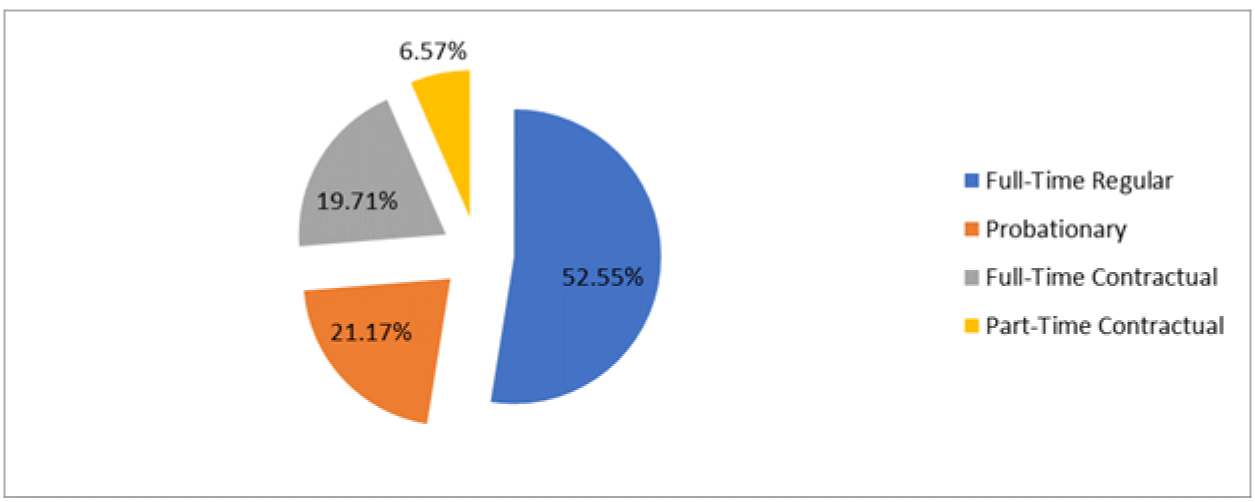

Figure 2. Profile of the Faculty members in terms of Employment Status (N= 137)

Access to the Internet. We wanted to know the status of the faculty members' internet connection in terms of both hand-carried devices and connection in their homes. In this survey, faculty members answered questions on the accessibility and availability of the internet. As expected, majority answered that they indeed have access to the internet (f=92, 90.51%).

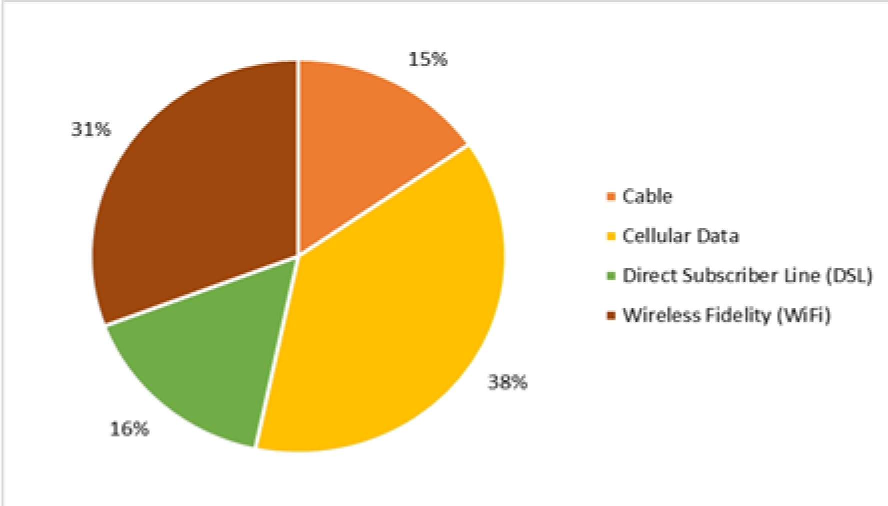

Figure 3. Internet Connection of the Faculty members (N= 137)

This is to be expected because encoding grades requires the use of an electronic class record and internet connection. A personal computer or laptop is also needed because it is where instructors create their class presentations (slideshows, videos, etc.) and store important files. But as shown in Figure 4, not all faculty members have a personal computer or laptop. A good majority of them do, however, which means that they are relatively capacitated enough to hold online classes. Another consideration would be the state of these laptops or computers. For instance, a faculty member may have a laptop/PC but its system specifications are not built for heavy usage, especially in online classes wherein one may need to open multiple applications at the same time and share one's screen. Interestingly, 33 faculty members reported that they did not have a smartphone. Majority also reported that they use a laptop/desktop computer to work from home (f=111, 81.02%), while 26 faculty members (18.98%) reported that they only use a smartphone.

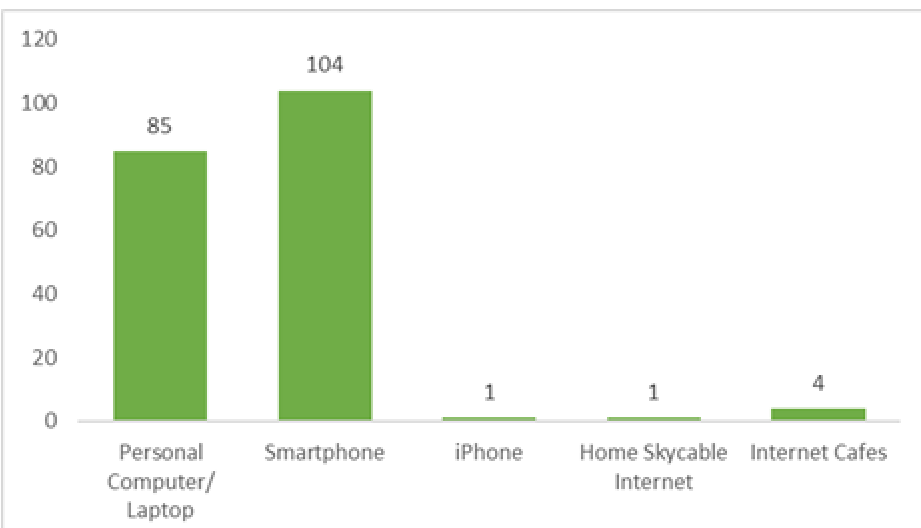

Figure 4. Medium used to Connect to the Internet (Multiple Responses)

Software Applications. The next table below shows a breakdown of results on what type of software applications are installed in the respondents' devices. This includes the software used for the operating system, database management systems, networking and etc.

Table 4. Software Applications Installed in Faculty's Devices (N=137)

Software Applications	f	%
Graphical Word Processing Program (e.g. MS Word)	112	81.75
Spreadsheet Program (e.g. MS Excel)	110	80.29
Presentation Program (e.g. MS PowerPoint)	114	83.21
Cloud Based Video Conferencing Program (e.g. Zoom)	99	71.93

As shown in Table 5 above, faculty members mostly have Graphical World Processing Program (f=112, 81.75%). A GWPP is system software that manages typical documents that are typed and can be printed out. Examples of these are Microsoft Word, Open Office, and WPS Writer. Furthermore, they were also asked to rate their familiarity with these programs on a scale of 1-4 with 1 as "Low" and 4 as "Expert". Results showed that their ability to use these programs is advanced (M=2.66, SD=0.71).

Majority of the respondents also reported having a spreadsheet program installed (f=110, 80.29%). Spreadsheet programs (SSP) are software applications that present tables of values arranged in rows and columns that can be manipulated mathematically using both basic and complex arithmetic operations and functions. The most commonly-used SSP for example would be MS Excel. For faculty members, having an SSP is a must because this is essential for making electronic class records and keeping organized databases for all kinds of purposes, such as research data. For spreadsheet programs, the group rated themselves as having basic ability only (M=2.34, SD=0.7).

Most of the faculty members confirmed that they have a presentation program in their device(s) (f=114, 83.21%). Presentation programs, also called presentation software, are software packages used to display information in the form of slide shows, such as MS PowerPoint or Prezi. These are also essential to teaching, both in a physical classroom or a virtual one. Ability to use these programs had an average rating of 2.58 (SD=0.75) which is translated to "Advanced". This is to be expected because teachers are well-acquainted with such programs for lectures or speakerships.

Lastly, majority also reported having a Cloud Based Video Conferencing program (f=99, 71.93%) such as Skype, Zoom, MS Teams, or Google Meet. In the post-pandemic world, such programs have become a daily necessity for conducting virtual meetings and gatherings.

Experience in Online Teaching. When asked whether they had experience in online teaching, only 50 (36.50%) faculty members out of 137 answered yes. This may be due to the fact that for so long, traditional classroom instruction has been practiced in the university. Only a few selected colleges were also able to try using online classrooms for instruction. We then asked the 50 respondents who answered yes for details about online teaching platforms that they had used. Table 6 below shows the results:

Table 5. Online Platforms that Faculty have Used (N=50)

Platform	f	%
Google Classroom	38	76.00
Edmodo	17	34.00
Moodlerooms	10	20.00
Facebook Messenger	5	10.00
Easy Class	3	6.00
Others (i.e. Skype, Weebly, Zoom, Blackboard, Canvass, & Kimini)	6	12.00

Challenges Experienced in Working from Home. Faculty members were also asked about challenges they experienced in the new work-from-home arrangements. Table 7 displays the results:

Table 6. Challenges Currently Faced While Working from Home (N=137)

Challenges	f	%
Internet Connection	96	70.07
General impact of COVID-19 on my life and in the community where I live	65	47.45
Absence of access to the tools and information I need to do my job at home	62	45.26
My physical workspace;	46	33.58
Too many distractions at home;	41	29.93
Difficult communication with co-workers	35	25.55
Keeping a regular schedule for work	29	21.17
Social Isolation;	28	20.44
Getting enough food and other supplies needed	20	14.60
Childcare ;	8	5.84
Others (i.e. financial resources)	5	3.65

The most pressing challenge of faculty members is the quality internet connection, followed by access and availability of devices needed to do their work from home, as well as the extraneous effect of COVID-19 on their lives as a whole. In spite of these challenges, we find that there was much potential to enhance skills of the faculty by providing upskilling trainings or workshops and by equipping them with the resources they would need in order to conduct flexible learning classes.

Baseline Survey for Academic Unit Heads. We then gave a survey to college deans in order to gain an idea of how the different academic units initially responded to the enhanced community quarantine. They were asked whether they continued classes by engaging in an alternative form of instruction delivery. Among all 10 colleges, only 2 did not hold classes once the ECQ was declared. The said 2 colleges offer programs that rely heavily on laboratories. This may be one of the reasons why some instructors could not immediately adapt their classes to an online platform given that the ECQ was also implemented relatively instantly, not giving laboratory-dependent subjects enough time to structure their classes.

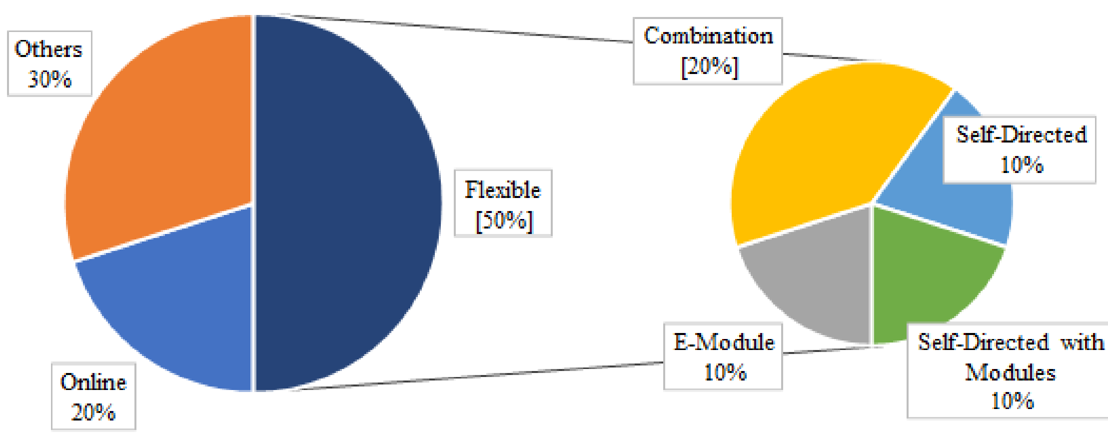

Figure 5. *Delivery Mode Used in Classes during ECQ*

As seen in the figure above, majority of the colleges did take the initiative to somehow continue classes in spite of enhanced community quarantine pushing through. Even in the absence of a unified flexible learning framework, the academic units found ways to push through with their delivery of instruction through various ways. Half of the colleges reported that they engaged in a flexible mode of delivery. Understandably, a flexible mode of instruction allows for greater chances of students accessing the material and accomplishing the tasks given to them. Two colleges reported that they used a combination of digital/classrooms, electronic modules, and print modules (for courses that require students to purchase books or manuals at the start of the semester).

Only 1 college reported that they prefer to conduct blended learning, a combination of face-to-face instruction plus other alternative delivery modes. When asked to specify what kind of flexible instruction the others planned on doing, most of them preferred, delivery of instruction online through modules. This may be accomplished through the use of virtual classrooms such as Moodlerooms, EasyClass, and Google Classroom among others. Three colleges mentioned that they are still willing to engage in face-to-face instruction, but with extra precautions. For example, one unit stated that they would prefer meeting in small groups and to continue utilizing their laboratories but with strict adherence to safety and health protocols. Two other units also expressed the same sentiment and stated that they would still conduct face-to-face classes with reduced population, in addition to alternative learning modes.

Half of the colleges however reported that they have been using flexible learning systems for 1-2 years already. On the other hand, only one college reported that they have been using FLS for 3-5 years already. This is also to be expected because the said college is responsible for catering to minor subjects of majority of the students in the entire university. The nature of the courses offered by the college (e.g. social sciences, humanities) typically involves the use of digital resources and platforms to maximize learning.

Online Education Systems. The heads were then asked about which online education systems or learning management systems their faculty have been utilizing. Figure 6 below shows the results:

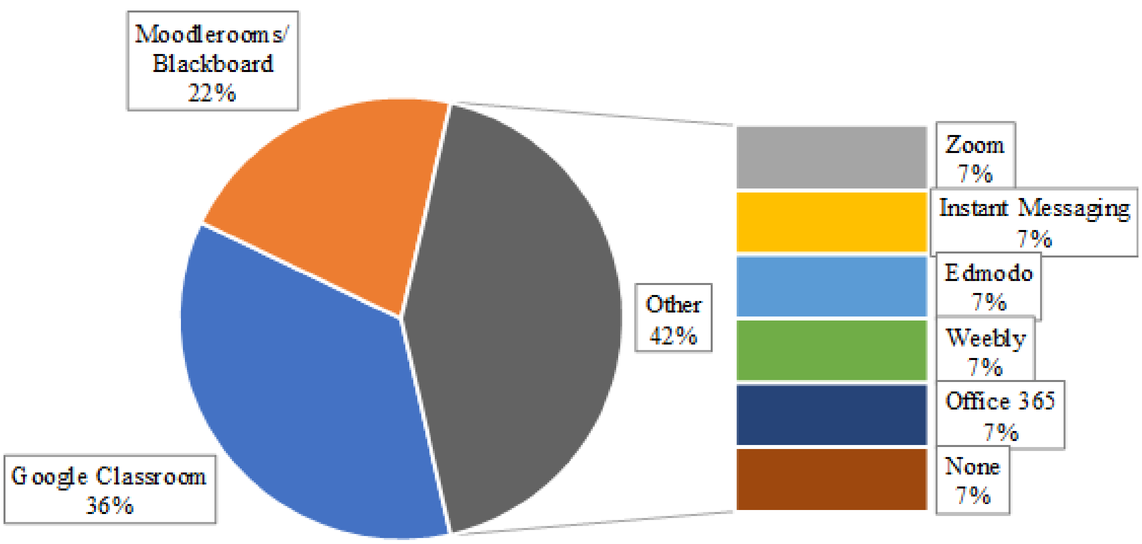

Figure 6. *OES/LMS Used (Multiple Responses)*

Among all OES/LMS, Google Classroom was the only platform used by five (50%) of the colleges. This is most likely due to the platform's accessibility and ease of site navigation. Additionally, Google Classroom also offers a free version which already does more than enough to cover the basics even if one does not avail of its premium subscription. Another LMS that had its fair share of users was Moodlerooms/Blackboard which comes with a limited trial period and needs a paid subscription for students and faculty to be able to continue to access it.

Modes of Communication. In terms of communication tools mostly used by faculty members to send/upload learning materials for students, all colleges offering medical-related degree programs stated that they only used online learning platforms such as Google Classroom (see Table 8). The college offering business administration courses was the only other academic unit to utilize these as well. For the rest of the colleges, instant messaging apps were mostly used instead. This is probably due to the accessibility of such apps and the higher probability that students will indeed be able to access the material sent to them. It is a staple nowadays for mobile companies to offer free promos for instant messaging apps (especially Facebook and Instagram). Out of all the colleges, only one reported that they solely used email to communicate with their students.

Putting this information into context, we can reliably conclude that all students heavily rely on social media apps and their corresponding instant messaging features to access online learning materials or to communicate with their teachers. As previously stated, these digital platforms are the most accessible to smartphone users and mobile subscribers.

Table 7. Mode of Communication between Faculty and Students (N=10)

Communication Tools	*f*	%
Email	1	10.00
Instant Messaging Apps (Messenger, Viber, WhatsApp, Discord, WeChat, Telegram, etc.)	5	50.00
Online Learning Platforms/Virtual Classrooms (e.g. Google Classroom)	4	40.00

These findings are further substantiated by the fact that only 39.3% of faculty members across all colleges reported have full internet access or high internet connectivity. Knowing that not all students and teachers are able to access online material, some instructors opted to utilize alternative offline strategies for distance learning. Majority of the colleges used printed copies of worksheets, lectures, and study guides (60%). One college who claimed that they only use learning packets/course pack through flash drives as an alternative offline strategy.

Conclusions of Phase 1 Formative Evaluation Survey Results. In this series of surveys, results are promising but also pinpoint the challenges faced by the institution, its front liners (in the form of teachers) and its clients, the students. The biggest obstacle in a seamless transition towards digital learning is the accessibility of good internet connection. However, academic institutions are not in the best position to address such issues because the bulk of such responsibility falls on the shoulders of internet service providers (ISPs) who can very well improve their delivery of services. At the time when these baseline surveys were conducted, the most that the university could do was to carefully analyze the survey results to assess the overall capability of its teachers and students for online distance learning, and then creatively craft ways to deliver quality education using the limited resources that all involved parties had.

Crafting the Flexible Learning System

Based on the results of the baseline surveys, a flexible learning system was conceptualized, aiming to cater to three types of learners: pure offline, pure online, and hybrid learners.

Offline learners were deemed as those who had no access to the internet at all and were therefore provided with printed modules that they could answer at their own pace. These modules could be picked up from the university or in specified drop-off points for those in the provinces.

Online learners were offered regular synchronous lectures through the MS Teams online platform.

Hybrid learners were those who could access the same virtual classrooms like the latter, but relied mostly on asynchronous learning materials as they had intermittent or unpredictable internet connection. Online and hybrid students were given on-the-go (OTG) flash drives containing learning materials as well.

Table 1 below illustrates the key points of the crafted flexible learning system and how it differs in delivery among the three modes (offline, hybrid, and online).

Table 8. InnUVate: Visayanian ACCESS Flexible Learning System Key Points

A	**Accessible and Available Learning Modality**	**OFFLINE Mode** *(for students with no internet access)*	**HYBRID Mode** *(for students with limited or intermittent connection)*	**ONLINE Mode** *(for students with full internet access & equipment)*
C	**Convenient Subject Scheduling**	Classes are scheduled in a way that only 2-3 subjects are offered per month.		
C	**Convenient Learning**	Self-Directed Learning	Asynchronous Learning	Asynchronous & Synchronous Meetings
E	**Equal Access to Learning Resources**	Hard copies of course study guides handed out at the start of the semester	At least one time or periodic access to the internet to download and save materials	Utilize Office 365 and MS Teams for virtual classrooms and synchronous sessions
S	**Self-Paced Learning**	Unstructured schedule in submission of outputs		
S	**Student-Centered Assessment**	Performance-based assessment (e.g. Student Reports/Portfolio/Case Study/Problem Solving)		

Corporate Accounts. Regardless of category, all students were given an institutional email address and access to MS Teams classrooms of the courses they were enrolled in. This was to ensure that anytime students had access to the internet, they would always have ways to access the learning materials provided.

Colleges were also mandated to disseminate information and announcements through email, social media postings, and/or official pages online to maximize information channels that can be accessed by the students.

Monthly Class Schedules. In the crafting of the FLS, steps were taken to ensure that students would not be overloaded or burdened especially during the pandemic period. For instance, a monthly schedule for classes was put in place. A student who had enrolled for 8 subjects would be taking two subjects in Month 1, another 2 subjects in Month 2, and so on. This way, the students were not burdened with taking all classes at the same time for all four months or spending several hours per day in front of their devices.

Course Study Guides. Another consideration was to ensure that no student would be left behind, and that learning outcomes across all modalities would be similar as much as possible. To achieve this, faculty members were assigned to write course study guides (CSGs) for subjects they handled. The CSGs contained the flexible learning course syllabus, a lesson guide, the lesson content, and assessment tasks. These CSGs were subjected to critiquing and editing, then used across all campuses. The uniform content made it much easier to deal with challenges such as students accidentally entering the wrong section, because instructors for one subject all used the same CSG for their content and class activities. Furthermore, the CSGs narrowed down their subject matter to the 4 most essential topics in the course. To match the monthly schedule, one lesson per week would be tackled in the class.

Assessments. All assessment tasks were similar across the learning categories. To keep the FLS fair, it was decided that there would be no major exams during the first implementation of the new system. This was largely due in part to the need for additional training and knowledge in remote monitoring of students, which at that time was not cost-efficient. Additionally, the university did not want to overburden students with exams while the pandemic was at its peak. Therefore each course only had a major assessment task in the form of a paper or a project towards the end that the students needed to comply.

Phase 2 – Mid-term Evaluation

This section discusses the results of the satisfaction surveys constituting the Phase 2 evaluation of the project.

Satisfaction Survey for Students. To monitor the students' satisfaction on the flexible learning system and services provided by the university during the pandemic, a survey was deployed by the end of classes.

Scope of the Survey. A total of 1,606 students responded to the online survey, among which only 1,547 consented to participate and have their answers recorded and analyzed. Below is the breakdown of participating students per year level:

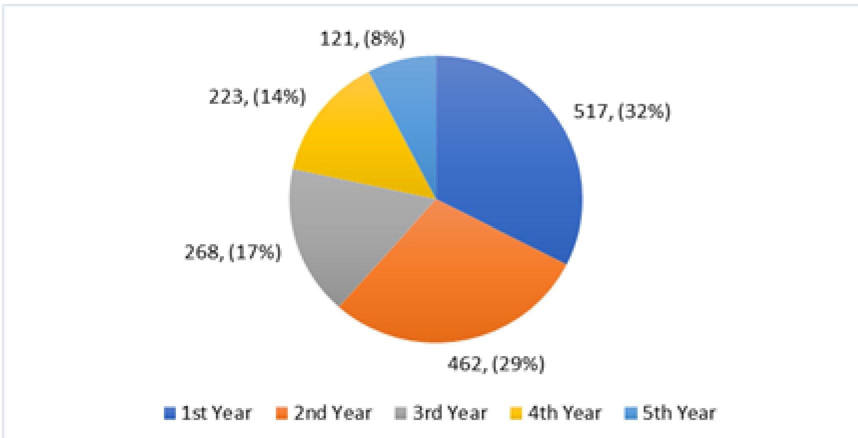

Figure 7. Breakdown of Students per Year Level

Many students from the lower year levels were more eager to answer the survey compared to higher years. Freshmen were exceptionally more motivated to answer the survey questionnaire, most likely because it is their first foray in higher education and they are eager to share what they have experienced.

For the respondents' breakdown in terms of flexible learning category, it is also interesting to note that many students who chose Category 1 (Offline) were able to answer in spite of the survey being available purely online. In fact, there are more category 1 respondents than category 3 (online). In other words, most students do indeed have access to the internet, however limited. It can be said that very few, if any, are unable to access the internet at all. The breakdown of respondents per flexible learning category is shown in the figure below:

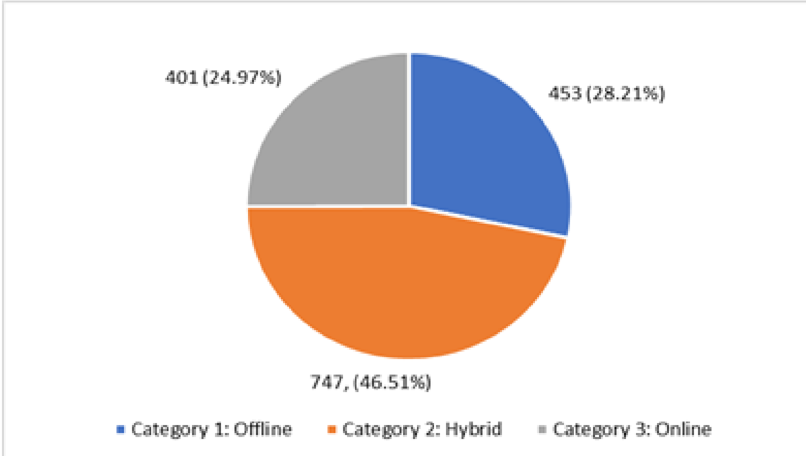

Figure 8. Breakdown of Students per FLS Category

Items in each of the surveys aimed to ask students about how satisfied they were with their flexible learning category. The students were asked to rate their course modules, the learning platforms utilized, the monitoring and feedback system, as well as the services offered by the university. The last part of the surveys also consisted of open-ended questions that allowed them to express their comments, suggestions, and recommendations.

Initial scrutiny of the raw data showed that students belonging to the hybrid and online categories tended to lean towards offering positive responses in the quantitative Likert scales, seldom giving low scores or feedback in their experiences. However, students belonging to the offline (modular) category gave relatively low or neutral ratings. The tables below summarize the students' feedback in the Likert scales they answered:

Table 9. Student Satisfaction Ratings: Category 1 (Offline)

	Mean	Interpretation
1. The lessons in my modules are easy to understand and digest.	2.43	Somehow Disagree
2. I was able to obtain my modules with ease and convenience.	2.46	Somehow Disagree
3. The assessment tasks were clearly relevant and aligned to the content presented in the lessons.	2.68	Neutral
4. The lessons in the modules will definitely be useful to me in my work someday.	2.99	Neutral
5. My instructors are willing to entertain my questions or clarifications whenever I reach out to them.	3.23	Neutral
6. My instructors periodically monitor my progress with the modules from time to time.	2.69	Neutral
7. The grading system is fair and just.	2.71	Neutral
8. I am satisfied with the assistance I received in the distribution of the modules.	2.90	Neutral
9. The assessment tasks and rubrics used are appropriate for the lesson.	2.92	Neutral
10. Overall, I am satisfied with the system used for offline learning.	2.89	Neutral
11. I would still willingly choose this learning category next time.	2.99	Neutral

Legend: 1.00-1.80 (Strongly Disagree), 1.81-2.60 (Somehow Disagree), 2.61-3.40 (Neutral), 3.41-4.20 (Somehow Disagree), 4.21-5.00 (Strongly Disagree)

The data in Table 9 imply that much leaves to be improved in the setup for the offline category of students. On average, they reported that the modules (also called the "course study guides") were not easily obtained. This was because of unforeseen difficulties in the logistics of delivering the modules especially to students in far-flung areas. For students who did receive their printed modules, some believed that the lessons were not easy to digest. This is probably because teachers handling courses that specialize in practical skills cannot properly transfer knowledge solely through the written word. As expected, such courses would not be highly rated among the students.

It is interesting to note that the rest of the items were mostly rated as “neutral” by modular students, however these same items were rated much higher by students belonging to the hybrid and online categories. Though delivery of instruction differed, the students were subjected to the same grading system, assessment tasks, rubrics, and lessons. These differences imply that the presence of a shared classroom or academic environment, even if remote/virtual, can make a huge difference in learner experience. Students who choose the offline category are left to themselves compared to learners who choose the other 2 categories. The presence of a social group allows students to ask questions faster, listen to virtual lectures together, and see constant activity in the virtual classrooms—something that offline students do not have easy access to.

Table 10. Student Satisfaction Ratings: Category 2 (Hybrid)

	Mean	Interpretation
1. The learning materials in my MS Teams classrooms are easy to understand and digest.	3.78	Somehow Agree
2. I was able to find my online classrooms/teams easily and conveniently.	3.89	Somehow Agree
3. The assessment tasks were clearly relevant and aligned to the content presented in the lessons.	4.00	Somehow Agree
4. The lessons we tackled within the 4 weeks per subject will definitely be useful to me in my work someday.	3.91	Somehow Agree
5. My instructors are willing to entertain my questions or clarifications whenever I reach out to them.	4.20	Somehow Agree
6. I am able to access links, files, and other supplementary learning materials easily in MS Teams.	3.99	Somehow Agree
7. The flexible grading system used is fair and just.	3.90	Somehow Agree
8. The assessment tasks and rubrics used are appropriate for the lesson.	4.04	Somehow Agree
9. Overall, I am satisfied with the system used for Hybrid classes (Category 2 learners).	3.94	Somehow Agree
10. I would still willingly choose this learning category next time.	3.84	Somehow Agree

Legend: 1.00-1.80 (Strongly Disagree), 1.81-2.60 (Somehow Disagree), 2.61-3.40 (Neutral), 3.41-4.20 (Somehow Disagree), 4.21-5.00 (Strongly Disagree)

Hybrid category students largely differ from the online category in the sense that they are not obliged to turn up to synchronous discussions, therefore their attendance in class is not as strictly monitored as category 3 students are. They are of course welcome to attend the said live lectures, but most of them are expected to watch recorded discussions at their own pace. Majority of the students made of up this category.

Table 11. Student Satisfaction Ratings: Category 3 (Online)

	Mean	Interpretation
1. The learning materials in my MS Teams classrooms are easy to understand and digest.	3.95	Somehow Agree
2. I was able to find my online classrooms/teams easily and conveniently.	4.04	Somehow Agree
3. The assessment tasks were clearly relevant and aligned to the content presented in the lessons.	4.06	Somehow Agree
4. The lessons we tackled within the 4 weeks per subject will definitely be useful to me in my work someday.	4.00	Somehow Agree

5. My instructors are willing to entertain my questions or clarifications whenever I reach out to them.	4.28	Strongly Agree
6.I am able to access links, files, and other supplementary learning materials easily in MS Teams.	4.10	Somehow Agree
7.The flexible grading system used is fair and just.	3.95	Somehow Agree
8. The assessment tasks and rubrics used are appropriate for the lesson.	4.07	Somehow Agree
9. Our online classes flow smoothly without interruptions or technical issues.	3.16	Neutral
10. Overall, I am satisfied with the system used for Online classes (Category 3 learners).	3.87	Somehow Agree
11. I would still willingly choose this learning category next time.	3.80	Somehow Agree
12. I am satisfied with MS Teams as our learning platform.	4.04	Somehow Agree

Legend: 1.00-1.80 (Strongly Disagree), 1.81-2.60 (Somehow Disagree), 2.61-3.40 (Neutral), 3.41-4.20 (Somehow Disagree), 4.21-5.00 (Strongly Disagree)

Interestingly, although the baseline surveys initially revealed that students were not very well-equipped to attend online classes, this learning category received the highest ratings. In fact, the item that rated lowest in the scale is the one on smooth, uninterrupted internet connection. Of course, much still leaves to be desired in this category as well, given that this online learning scheme is a first for many instructors and students alike.

To provide depth in the quantitative results of the survey, we also asked the students open-ended questions about their feedback on the FLS. This was to provide supporting information on the areas that needed improvement and the practices that could be retained.

Positive Feedback on the FLS. One of the aforementioned open-ended questions asked the students what they liked best in their classes for the first semester. The word cloud below shows the most prominent responses, wherein larger text means more recurring answers:

Figure 9. Word Cloud on What Students Liked Best in the FLS

Based from the statements of the students and the figure above, the following are the things which students liked best about the pandemic, along with quotes lifted from the students' testimonials:

1. Flexibility in the learning system (i.e. freedom to manage their schedule, more free time between subjects, only 2-3 subjects per month, freedom to utilize online resources or Google if needed)

> "What I liked the most about this flexible learning system is that there are only two to three subjects per month. From my experience it was surprisingly for us students to hear that students from other schools are stressed from their workloads. We however can focus on certain subjects and can also do our household chores."

2. Patient and dedicated teachers who provided constant communication with students

> "I like the way the instructors teach us. They are very dedicated despite of the barriers encountered throughout the whole semester."

3. Opportunity to maximize available technology and gadgets

> "[I now] know better how to use computers and cell phone, because through these gadgets, I am able to connect and still reach out or catch up my review classes in this 1st semester. Thank you."

> "[I like the] technical integration of the MS Teams software + free Microsoft Office"

Points for Improvement on the FLS. The word cloud below illustrates the aspects that students want to be improved the most:

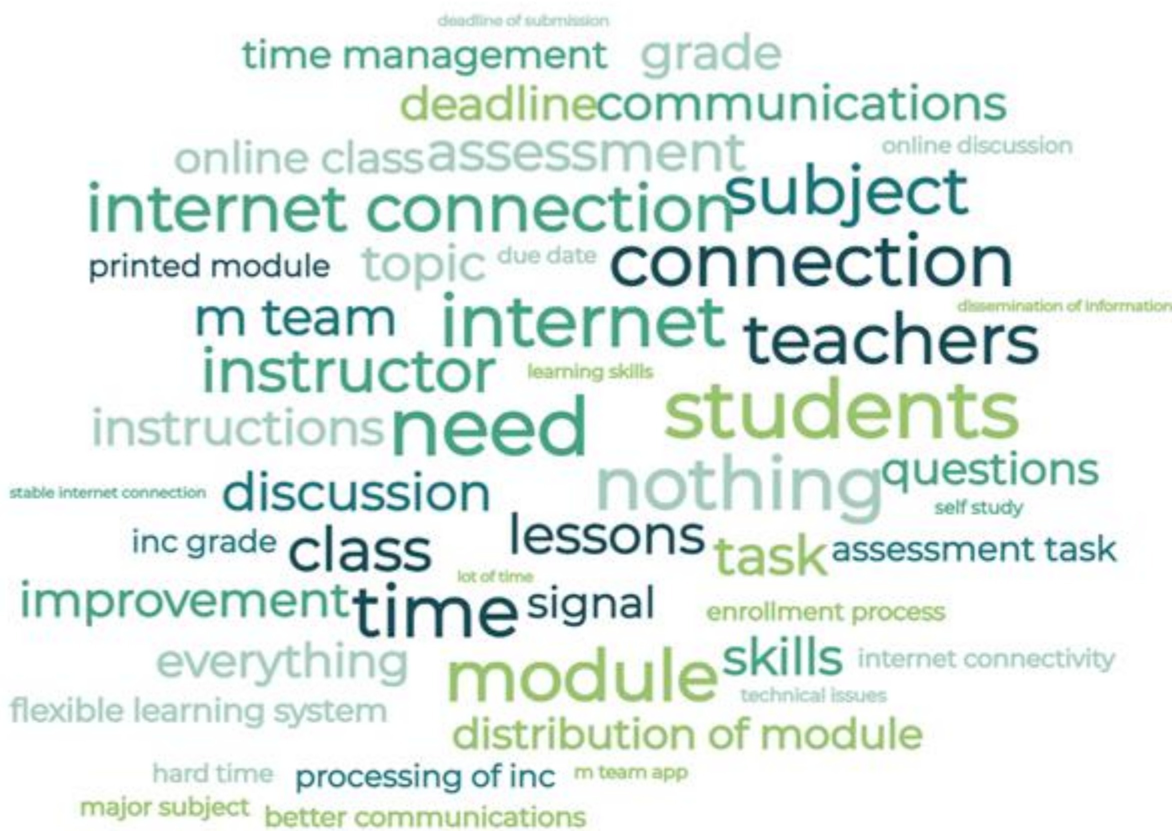

Figure 10. Word Cloud on What Students Want to Improve in the FLS

The following were the students' top points for improvement, along with sample quotes from the feedback surveys:

1. Modules need to be distributed on time, as there were some errors and issues in the delivery and distribution of printed course study guides in the various drop-off centers.

> "We should follow the delivery schedule. After one month I still haven't received even a single module. And when I wanted to pick up my modules they told me that it is still not available for pick up."

2. Information dissemination and official communications about scheduling of classes and other announcements should be improved.

> "I think the university needs to improve their communication to the students especially those who have concerns regarding with their subjects, like adding subjects."

3. Longer hours for professional subjects should be offered, especially for board exam courses.

> "I think the only thing that needs to be improved is to have our major subjects specifically the board subjects to be prolonged because the 4 weeks is not enough for us to digest it well."

These points for improvement were duly noted and taken as basis for crafting recommendations in the revised structure and setup of the flexible learning system, which the project team aimed to implement in the succeeding semester.

Conclusions of Phase 2 Midterm Evaluation Survey Results. The midterm evaluation phase gathered data right after the pilot deployment of the flexible learning system. Results heavily suggest that most students who chose Category 1 (Offline) did so not because they have little to zero access to internet connection. Instead, what made them select that category was the freedom to pace their own studies. However, many also expressed that they still needed monitoring and assistance from the teachers. As for Categories 2 (Hybrid) and 3 (Online), students' experiences did not largely differ.

For instance, many Hybrid students (who supposedly have limited internet connection) still attend synchronous lectures because they don't want to "miss" a lesson, and they want to have the chance to ask their instructors any questions or clarifications. Many Online students also inform teachers that they cannot attend a certain synchronous lecture because they have problems with their internet. In effect, this led to a "blurring" of the distinction between category 2 and category 3 students.

Recommendations

Based on the students' feedback, the following recommendations are proposed:

1. Starting the next semester, there shall only be two learning categories offered: instructor-led, and self-paced learning:

Table 12. Changes to Flexible Learning System Categories

Characteristics	Self-Paced	Instructor-Led
Virtual/Remote Learning	✓	✓
Access to LMS and virtual classrooms	✓	✓
Access to uploaded reference materials and pre-recorded lectures online	✓	✓
Attendance in synchronous lectures	X	✓
Weekly deadlines for tasks	X	✓
Semestral deadlines for tasks	✓	X
2-3 courses/subjects per month	✓	✓
Printed course modules	X	X
Submission of tasks through LMS/virtual classroom	✓	✓

Offering these options addresses students' concerns to stay safe at home while at the same time allowing them the opportunity to learn at their own pace. For those who prefer the assurance of an instructor's guidance and pacing, they are also given that option. These categories also provide an opportunity for smoother transition towards blended learning, should the situation allow for it.

2. Transitioning to mostly virtual learning also allows better utilization of LMS features that open and close exams at a certain time period. This way, perhaps the university can slowly transition once again towards having major exams (even if only midterms and finals exams are held). At the same time, this may also allow for smoother collection of tuition fees as students are used to paying their installments during major exams.
3. Since students reported that they appreciated a setup having only 2-3 subjects per month, this shall be maintained for AY 2021-2022. Many students however also requested for more time allotted for discussions in their professional subjects (especially for board exam courses). To address this, the LMS and virtual classrooms should be set up by the beginning of the semester so that pre-recorded lectures are already available. Synchronous sessions therefore will not be catered mostly for discussions but for clarifications and answering students' questions. Students of course shall be expected to turn up to synchronous sessions having already watched the pre-recorded lectures and read the lessons from their course packets.

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Research Capability of Teachers in Public Secondary Schools in the Province of Masbate, Philippines: Basis for an Extension Program

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Abstract - Teachers in the Philippine basic education sector are encouraged in research to promote a culture of evidenced-based policymaking. They are expected to possess basic or advanced skills in conducting investigations, surveys or experiments and in performing data analysis in their teaching fields. In this descriptive survey research, we assessed the perceived research capability of secondary school teachers (n-1,637) in Masbate during the COVID-19 pandemic and the need to enhance their research skills in terms of formulating, conceptualizing, writing, constructing and conducting research. The study sought to measure the level of research capability of secondary school teachers, as well as the challenges encountered and the interventions. Results showed that teachers were "slightly capable" of conducting research. Thus, findings suggest to conduct research capability enhancement program to all the teachers. Majority of the teachers lack scientific training (87.72%) and are willing to participate in any research endeavor. Among the challenges faced, participation to research trainings (84.30%), school-based mentoring (78.31%) and collaboration with experts (77.64%) were the identified solutions. The findings serve as a foundation for the school officials to build a functional growth plan to become more responsive and effective in teaching research, which is crucial to developing critical thinking among students. Furthermore, it is recommended that the schools provide relevant trainings to intensify school- level mentoring, promote collaboration and enforce the acquisition, creation and distribution of updated research guides to all teachers.

Keywords - Research Capability; DepEd; Challenges; Interventions; Enhancement Program

Introduction

In an ideal world, educational research has a vital role to play in the improvement, whether it is developing theory or stimulating ideas for creative practices, as described in the Livingstone (2005) of the UNESCO-international Institute for Educational Planning (IIEP) on Basic Elements of Research Design. Most government and non-government organizations are expected to develop research agendas in order to solve societal problems and contribute to national development (Calderon and Gonzales, 1993), and it must be focused on the state's proclaimed policy under the 1987 Philippine constitution to "create, sustain, and support a full, sufficient, and integrated system of education relevant to the needs of the people" (Calderon and Gonzales, 1993).

One of the stated needs for meeting global demands and catching up to other nearby countries is to improve the quality of education. In the majority of studies, it was revealed that effective learning happens when there are effective teachers. It is therefore imperative to improve the quality of our teachers. Unfortunately, it was also discovered in several studies that a lack of teacher enhancement program is one of the contributing factors that must be given attention (Zhang, 2016; Banilower, Heck, Weiss, 2007; Ciocon, J.L, 2016, Lucernas, Delavin 2019;). Also, the importance of teacher education (Hine, 2013; Hong & Lawrence, 2011; Young, Rapp, Murphy, 2010; Vogrinc & Zuljan, 2009; Hien, 2009) and how it affects classroom instruction (Mahani, 2012; O'Connor, Greene, & Anderson, 2006). Teachers serve as catalysts for change and conscientious agents of change. Others can underestimate them, but their influence at work is undeniable. The nation's future is in the hands of schools, and teachers have the ability to make or break it.

Conducting research has the effect of bringing about continuous improvement in education. It offers validated evidence to enhance the consistency of educational policy decision-making. Without a doubt, this is what got us to where we are now (Boykin, 1972). The Governance of Basic Education Act of 2001 (Chapter 1, Section 7(5), R.A. 9155) strengthens the conduct of educational study in basic education. It directs the Department of Education (DepEd) to "undertake (national) educational research and studies" that will serve as the framework for needed reforms and policy inputs. Furthermore, the DepEd Order 43, s.2015 emphasizes that research purifies people's activities and lives, with a focus on improving performance and finding information in particular. It explains how to solve problems in a methodical and objective manner and this is necessary for our teachers to systematically solve school problems. Educational research is focused on understanding, clarifying, predicting and regulating human behavior to some extent. It has used scientific research methods to acquire the information needed to strengthen instructional planning, decision-making, teaching and learning, curriculum development, children's and youth's comprehension, educational media use, school organization, and educational management (Boykin, 1972). Curriculum growth and improvement, educating slow learners, recognizing the psychological attributes of physically impaired students, and adapting learning methods to the needs of individual learners have all benefited from research study.

All teachers are expected to follow the Basic Research Agenda (DepEd 2016). They are encouraged to perform basic or action research as it is a requirement of their careers for promotion. Most notably to all master teachers, who are expected to perform in-depth studies or action research on instructional issues as stated in their Position and Competency Profile. The school principal's reputation in assessing faculty research would be affected if he or she lacked the expertise to perform research or even complete one. Therefore, he/she should be knowledgeable in conducting research. Likewise, secondary teachers who are teaching research subjects or subjects with research requirements need to acquire necessary skills in conducting research.

Unfortunately, out of the 3, 819 total number of teachers, there is only a small percentage of the total employees who were able to perform research in the Division of Masbate Province. The achievement in terms of research and development is frustrating. The data strongly suggests that a research study should be undertaken, which will serve as basis for addressing the issue.

In this regard, the researcher endeavored this study to evaluate the respondents' level of research capability using a standard survey questionnaire anchored in the DepEd Order No. 16, s. 2017, the challenges encountered in conducting research and the suggested interventions which will serve as basis in crafting research capability enhancement program.

Methodology

The analysis used a descriptive research approach which incorporated qualitative and quantitative data. Following the indicators given in D.O. No. 16, s. 2017, a standard survey questionnaire was used and purposive convenience sampling technique was utilized. The respondents to this study were the 1,637 public secondary school teachers in the District of Masbate Province. The researcher used weighted mean to assess the respondents' level of research capability, and used adjectival interpretation to evaluate the findings. The distribution of scores across a set of data on the respondents' research capability was determined using the weighted mean. The weighted mean of all the measures in each level was added and divided by the total number of cases for the overall research capability of secondary school teachers.

The challenges experienced in conducting research were statistically described using frequency, percentage, and ranking, as well as the respondents' suggested approaches to resolve the challenges. The frequency of the data was calculated. The percentage technique and ranking were used to determine the significance of the qualitative data. Responses on the challenges and suggested interventions were thematically analysed,

Results and Discussions

The data gathered were presented in a logical manner according to their rank based on the percentage of the responses taken for each sub-problem. Moreover, each item under second to fourth sub-problems were presented with personal views of the respondents to further explain the choices they have chosen.

Level of the Research Capability of Teachers in Public Secondary Schools in the Province of Masbate

Table 1. Level of the Research Capability of Teachers in Public Secondary Schools in the Province of Masbate

Indicator I am capable of…	Mean	Secondary Adjectival Value
formulating research title	2.11	Slightly Capable
writing rationale/introduction/background of the study	2.10	Slightly Capable
writing the research conceptual framework and research paradigm	2.12	Slightly Capable
writing statement of the problem	2.12	Slightly Capable
formulating hypothesis/hypotheses	2.11	Slightly Capable
writing significance of the study	2.21	Slightly Capable
writing scope and limitation of the study	2.10	Slightly Capable
writing definition of terms	2.11	Slightly Capable
writing the review of related literature and studies	2.01	Slightly Capable
writing a research proposal	2.01	Slightly Capable
writing research methodology	2.09	Slightly Capable
determining the research design to apply in my study	1.84	Slightly Capable
adopting/ constructing/ modifying research instrument	2.09	Slightly Capable
writing abstract	2.08	Slightly Capable
writing results and discussion	2.12	Slightly Capable
writing conclusions	2.00	Slightly Capable
writing recommendation	2.09	Slightly Capable
applying APA format	2.10	Slightly Capable
Overall Weighted Mean	**2.07**	Slightly Capable

econdary

*1.00 – 1.49 Not Capable 1.50 – 2.49 Slightly Capable 2.50 – 3.49 Moderately Capable 3.50 – 4.49 Capable 4.50 - 5.00 Highly Capable

According to the data presented above, secondary teachers' research capabilities in all indicators are "slightly capable". The corresponding overall weighted mean is 2.07 which can be interpreted as slightly capable. The data revealed that majority of respondents are only slightly capable of formulating, conceptualizing, writing, determining and constructing different parts of basic research. Without the knowledge and skills in doing these important parts of the research study, teachers would not be able to successfully write a research paper. This is primarily the reason why out of the 1, 637 secondary teachers only few were able to submit and complete a research proposal in the entire Division of Masbate Province. They were incapable of formulating a title, a conceptual framework, statement of the problem, hypothesis, review of related literature, a proposal, research methods, and writing results and discussion as well as adopting / constructing / modifying research instruments. The result of the study is similar to that of the study conducted by Manuel Caingcoy entitled research Capability of Teachers: Its Correlates, Determinants and Implication for Continuing Professional Development where most of the teachers were also slightly capable in the different indicators.

Teachers are undoubtedly confronted with various educational maladies and research is extremely important in order to combat the declining quality of education, more so in this time of pandemic as it was highlighted in the 2020 Global Education Monitoring Report. Teachers can be taught and are adaptable in a variety of ways. If they were only mentored or guided on how to conduct research correctly, they would be able to solve school problems and contribute to the system's growth performance (Belanger, 1992). The concept of teacher- as- a researcher as it is cited in the ERIC Digest in one journal states that teachers should be collaborators in revising curriculum, improving their work environment, professional teaching and developing policy. Teachers can reverse the trend of Philippines performance in education by increasing research productivity according to the Asian Productivity Organization.

Teachers in most of the district of Division of Masbate Province, when it comes to instructions, student outcomes, community connections, and personal and professional growth and development, secondary teachers often run into issues. In order to effectively address these issues, research is critical. As a result, they must seek out opportunities to develop their research skills. According to one of my interviews, there were research trainings conducted but only few or identified participants are allowed to join the training and mostly are master teachers and school heads (D.O. No. 43, s. 2015). But how about those who are teaching research subjects in the secondary level and those teachers who would like to pursue a research endeavor? The department is encouraging teachers regardless of their academic position to pursue research and so all teachers must be given the chance to become part of the research trainings most especially those who are aspiring to become master teachers.

According to one of the respondents, to quote what he exactly said, “Conducted training for the teachers should be outcomes- based, like if teachers attended a research training, they should have created research proposals or completed research after the duration of the trainings or should there be an assessment on measuring the impact of the trainings attended”.

The proper authorities should work hand in hand to little-by-little help teachers become capable enough to handle research endeavors in the future for the continual advancement in the field of education. Teachers must put in mind these young children in pursuing for professional development. With research they can create developmentally appropriate practices as products of their research endeavors. Moreover, research also holds a high number of points if they want to be promoted to a master teacher position, according to the issued DepEd Order No. 66, s. 2007, which emphasizes that research themes must be matched with research agenda according to level of governance. They ought to initiate research either action research or applied research. This has to be acknowledged/noted/endorsed by the School Head/ School Research Committee (SRC), reviewed by the Schools Division Research Committee and recommended and approved by the Assistant Schools Division Superintendent and Schools Division Superintendent respectively.

Furthermore, along with the implementation of the K to 12 Curriculum, practical research subjects are being offered both in junior and senior high school based on the Enhanced Basic Education Act of 2013. It is therefore imperative that secondary teachers should have enough knowledge, skills and attitudes towards research in order to create impacts in teaching research subjects. Research is significant in nurturing and producing upright and competent graduates (Tamban & Maningas, 2020). Unfortunately, in assigning teachers handling research subjects both in junior and senior high school, there is an absence of guidelines or requirements on who shall rightfully handle the subject which means that anybody from the group can handle research subjects. With the result of this study, key officials may craft a guideline or set qualifications and requirements before assigning a member of the faculty to handle research subjects.

“Students are taught how to conduct research in high school so that by the time they reach tertiary level, they will have gained some experiences and acquired the required skills. They are expected to be led by their research teachers”, according to one of the respondents in the secondary level.

Students will not learn in the best possible way or master research skills if their teachers lack research skills. In order to obtain enough and the right knowledge, skills, and values in terms of research, teachers may attend enhancement trainings (Cruthaka, 2016). This also conforms in the study conducted by Victoria Elip Tamban and Ofelia B. Maningas, entitled research capability of Public-School Teachers: A Basis for Research Capability Enhancement Program wherein the results of the study recommended the need for intensive seminar/ training write-shop for technical writing of completed research for teachers. Furthermore, it was also cited in the study of Gareth Rees, Stephen Baron, Ruth Boyask and Chris Taylor about “Research Capability building, professional learning and the social practices of educational research” that to achieve more realistic expectations, there is a need to develop alternative approaches that acknowledge the exigencies of the current social organization of educational research.

The Department of Education's top officials must ensure that secondary school teachers who teach research subjects should have strong research skills. They must ensure that schools have sufficient resources to conduct effective research-based teaching in the classroom. They can also take advantage of the numerous trainings and webinars available on the internet in order to develop their knowledge and skills. Furthermore, it would be extremely disappointing if teachers who teach research subjects had not conducted even one research study. The reputation of the teachers should also be considered. Those in positions of higher authority should review the curriculum and offer interventions to address the issues. Many higher education institutions have experts in conducting and teaching research, and they can benefit from the extension programs of these institutions.

Teachers usually want the best for their students since their success is contingent on them. The Department of Education may pay attention to this level of research skill among teachers. Aiding teachers in acquiring the essential information, abilities, and attitudes for undertaking research is beneficial to the institution's research program.

Challenges Met in Conducting Research

Table 3, depicts the challenges encountered by teachers in Public Secondary Schools in the Province of Masbate and were given descriptive analysis supported by some statements coming from the respondents during the interview.

Table 3. Challenges Met in Conducting Research Among Teachers in Public Secondary Schools in the Province of Masbate

Problems and Challenges	Frequency	%	Rank
Lack of Scientific Training	1436	87.72	1
Time Management	1257	76.79	2
Not Having a Definite Deadline	769	49.98	8
A Quality of Literature	878	53.63	7
Implementing Quality of Writing within literature Review	1094	66.83	3
Insufficient Data	1008	61.58	4
Lack of Confidence	679	41.48	11
Focus is Too Broad or Too Bad	552	33.72	12
Library Management	354	21.62	16
Lack of Access to Resources	987	60.29	5
Lack of Support from Supervisors	532	32.50	14
Sustaining Writing Productivity	794	48.50	9
Career Issues	217	13.26	17
Teaching	975	59.56	6
Colleague Friction	127	7.76	18
Incentivizing Participation	786	48.01	10
Absence of Team- Based Research Culture	547	33.41	13
Aligning Survey Questions with Research Questions	450	27.49	15

The following are the themes that naturally emerged from the respondents' interviews.

Lack of Scientific Training (87.72%)

The majority of those polled said they lacked "scientific training." This is one of the main reasons why teachers are unable to conduct research due to a lack of skills. According to one of the respondents, "Not all of us are given the opportunity to attend research trainings, and even given the chance, we will cover the costs of attending the trainings. Really, only few teachers were sent to the research related trainings."

All teachers must be given the chance to attend research trainings to boost their confidence in equipping teachers the right knowledge, skills and attitude towards research even collaborative research because this is one of the identified problems in education (McWilliam & Lee, 2006).

Time Management (76.79%)

One of the most common barriers to undertaking research, according to most of respondents, is time management. This is especially true for teachers who have a lot of work to do at school. DepEd Curriculum Implementers must continue to monitor their teachers by conducting research-based needs assessments to determine what the teachers actually need based on their identified experiences. Because the educational context is constantly changing and stakeholders have many demands, they must pay special attention to the ongoing professional development of their teachers (Attard and Armour, 2004). In order to solve the issues, employees or those with expertise in the division or province, as well as those from other agencies, must be tapped. This should be included as part of the School Learning Action Cell Program (D.O. No. 35, s.2016), which is a great way to mentor or guide teachers through the process of conducting research, particularly action research.

Implementing Quality of Writing within literature Review (66.83%)

Another thing that the study's findings showed is the consistency of writing a literature review. The majority of teachers worry about how to create a good literature review. Most researchers give up conducting research until they are burdened with reading a large number of literatures in order to write a qualitative report. To quote what one respondent said during the interview,

" I have read a lot of references and studies in writing qualitative research review but I still find my work a mess."

Review of related literature is a requirement for every robust research whether qualitative or quantitative study because it offers a solid theoretical foundation for the research. A researcher creates the academic vacuum of his/her research to fill by craftily reviewing the related literature, justifying the need and essence of the research (Hefferman, 2016 & Bowen,2009).

Insufficient Data (61.58%)

The data is considered to be the most important aspect of any research project. The research analysis is useless without the data. Just like in today's situation where majority of respondents have struggled to collect data, particularly in this period of pandemic crisis, when researchers must adhere to all health protocols and restrictions to prevent the virus from spreading. Respondents are also reluctant to participate in the researchers' survey because they have too much work to do and so many proposals to make. Although the researcher may choose a more convenient sampling method, some studies need adequate data to ensure the consistency and reliability of the findings (Sauce, 2016).

Lack of Access to Resources (60.29%)

Teacher researchers must have access to the services they need, which must be provided by the school administration. Many respondents claimed that they lacked support, which was reflected in the findings. School principals should be very helpful, and co-workers should be involved and participative in this form of endeavor. They must have the required data to help the researcher complete his or her study.

Teaching (59.56%)

Becoming a teacher is a huge responsibility. All other careers are made possible by it. Teachers are more than just educators; they also serve a variety of roles in the classroom. Teachers are immersed in this kind of culture. There are several teaching opportunities available. However, when it comes to research, they have a different perspective. A thorough analysis requires a lot of work and resources, and if they do it, they must be certain that their teaching time will not be interrupted. According to one of the respondents,

"We are teachers, we are bound to teach not to research."

They regard their time and commitment to teaching as a challenge because of the demands and crises they face.

A Quantity of Literature (53.63%)

The literature, particularly the quantity of its presentation, is crucial to the study's process and communication of its findings. The researchers are painstakingly meeting relevant research findings, reading and digesting the key findings, summarizing through reports, and drawing conclusions about the evidence as a whole. Many literature reviews fall short of the required quantity and the norm when it comes to systematically synthesizing the reviews, and as a result, many end up presenting their literature in a biased or incorrect manner. Lack of significance, clarity, and comprehensiveness are some of the most common comments made to researchers in the literature of their studies, and typical reviews also lack sufficient critical assessment of included study validity, treating all evidence as equally relevant.

Not Having a Definite Deadline (49.98%)

Most of the respondents had to deal with strict deadlines for their research studies. Teachers in the Department of Education have full autonomy on when they suggest and complete research studies. This does not provide them with a set deadline for completing the analysis. Teachers are not required to conduct research in schools and there are no research goals, but they are encouraged to do so.

Sustaining Writing Productivity (48.50%)

According to experts, many of us find the best time to write is when we have an overwhelming list of ideas. When you begin a research study, you should exercise patience and strive for at least gradual progress. One of the respondents posed that,

"I am not good in writing that is why I could not make a research proposal."

A research study is not a one-time project; rather, it is a long-term, thorough investigation into specific issues.

Incentivizing Participation (48.01%)

Conducting research is a time-consuming task, and researchers must be given sufficient resources to meet the requirements in a systematic manner. Unfortunately, many people lack all of the necessary tools, and their only option is to strategize creatively, especially when collecting data or supplementing performance. The involvement of the respondents is one of the issues with data collection. Researchers are struggling to find ways to motivate their respondents with the minimal monetary and in-kind rewards available to them. There must be a reason for respondents to be interested in your research; otherwise, data collection will take too long and you will be unable to complete the study.

Lack of Confidence (41.48%)

Some of the respondents have low self-esteem, which is a weak factor when conducting research. This significantly impacts on the researcher's ability to work effectively. The teacher must seek guidance and professional assistance. Conducting a research study is not an easy endeavor. To continue with the study's goals and objectives, a researcher must have a high level of self-assurance and trust. It is proposed that superiors or subordinates can improve the researcher's morale by providing constructive input and recognizing even minor accomplishments. The researcher must develop as a person who is willing to try and learn new things.

Focus is Too Broad or Too Bad (33.72%)

Choosing which research study to undertake is one of the most difficult aspects of conducting a study. There are several subjects to study for various purposes, but the researcher may be unable to continue due to too broad or too bad chosen study. Researchers are having difficulty conducting analysis because the study is either too large or too poor. They can already tell that the analysis will not be completed within the planned timeline, that funding will be inadequate, and that it will necessitate a large number of conditions that must be met. One of the respondents said that,

> "In my opinion, the research should be started by finding ultimate objectives or broad problem. We should try to divide or narrow it into several specific questions that are possible to be answered. In real practice, research questions might be having preliminary answer and we believe that we can find the answer based on available data and methodology. However, it should be considered that to find good research question we should learn about existing literature and try to find a gap that could be fulfilled by our research."

When undertaking a study, researchers must ensure that the study is practical and that it is reviewed by experts for feedback and improvements, or else their efforts and resources will be wasted.

Absence of Team- Based Research Culture (33.41%)

Due of the competitive atmosphere in the DepEd, more teachers are competing fiercely with one another for a variety of reasons, but one thing is certain: promotion. Research isn't just something you do on your own. Researchers may use research to solve common workplace issues in a collaborative manner. The issue is that there is a lack of understanding of the situation. To conduct research effectively, a team effort is needed. Many organizations, on the other hand, do not support team-based study, which would enable dispersed individuals to interact and collaborate on a common goal.

Lack of Support from Supervisors (32.50%)

Supervisors sometimes do not help teachers in their research efforts. There are several teachers who want to conduct research, but they are unmotivated due to the supervisor's lack of support. Supervisors can be dismissive of the teacher researcher's choices at times, leaving them feeling as if they have failed in some way. According to some respondents,

> "When we try to do research, we are bombarded with questions."

Their superior is seldom willing to assist them, even though they have the necessary resources. Teachers compete with one another for promotions, spotlight time, and recognition. Of course, if a researcher does not receive the kind of encouragement and motivation they need, they will lose their desire to undertake a research study.

Aligning Survey Questions with Research Questions (27.49%)

Another emerging problem is how to aligned survey questions with study questions. One of the respondents said that, "I am encountering problems in aligning the different elements to logically and consistently narrate the flow of my study across different elements of the study."

With the support of an experienced and professional principal in the field of research, teachers will be given clear instructions about how to carry out their duties. They can also benchmark or adopt a study to be sure that they are doing what is right.

Library Management (21.62%)

While all can now be accessed via the internet, it is only beneficial to those who are from urban areas where the link is secured and there is no power interruption. Some schools in the Division of Masbate Province do not even have libraries, which is why some are having difficulty reading reference materials. Some online references require payment in order to access them, which adds to their financial burden. The province does not have an established digital library where they can rely on whenever they are pursuing a study.

Career Issues (13.26%)

There are times when a teacher's employment does not match their baccalaureate degree and specialization, and some of them would struggle to do research if they wanted too because they lack the necessary skills and expertise. They may not have a full understanding of teaching and other educational values. Others are unmotivated in their chosen profession because it is not what they really want. They are preoccupied with the possibility of moving to another department because they are dissatisfied with their current role.

Colleague Friction (7.76%)

Commonly respondents stated that they did not have any disputes with their co-workers. They deal with their issues in a professional manner. Some workmates are also encouraging and provide guidance to the teachers who are conducting research. In some districts, teachers would often assist and engage actively in the studies of their colleague because they believe the study's findings would solve common problems in their school. Others are incredibly proud of them because only a small percentage of teachers have the courage to do research.

Teacher researchers face obstacles when conducting research, but this does not deter them from striving for change in their workplace, personally and professionally, and most importantly for the sake of their students. While some teachers have negative attitudes toward research, it is undeniable that research is necessary in resolving issues and problems in the classroom and throughout the school (Darling-Hammonds & Berry, 1998; Hine, 2013; Hong & Lawrence, 2011; Young, Rapp, Murphy, 2010; Vogrinc & Zuljan, 2009; Hien, 2009). These obstacles are documented in numerous studies in different places (Caingcoy, 2020; Calderon, J. F. & Gonzales, E.C., 1993; Hine, G.S.C., 2013; Vasquez, V.E.L, 2017). These challenges are associated to low research productivity in schools (NA Alhija, 2017; HW Marsh, 2002; CJ Cocal, 2017; RS Cardona, 2020) and these in turn suggest that teachers should be given enough knowledge and skills in order for them to solve encountered problems through research (O'Connor, et.at,2006; Ulla, 2017, Borg,2014; Hong and Lawrence, 2011; Burns, 2010). Similar to the study conducted by Lucernas & Delavin in 2019, the data of the study suggest that the attitudes of the teachers greatly affect the performance of the teachers in the field of research (Elmore, & Lewis, 1991, Woelke, 1991; Zeider, 1991). The impact of research in the school development have gained so much interests in further exploring the capability of teachers in conducting research in the different provinces of the Philippines (Deen & Lucas, 2006; Maher, Timmerman, Hurst, & Gilmore, 2009; Robertson & Blackler, 2006; Steigelmeyer & Feldon, 2009). The result of this study is expected to be considered by the schools' principals, heads and policy makers in order to promote and encourage teachers to do research. They must develop positive attitudes of teachers towards research and constantly intricate in their minds that research has a vital role to play in the real-context of their personal and professional lives, to the learners, the school and the community.

Interventions to Address the Challenges Met

Table 4, shows the suggested interventions of respondents to address the encountered problems in conducting research.

Interventions	Frequency	%	Rank
Manage Resources Wisely	1063	64.94	4
School- based Mentoring	1282	78.31	2
Manage Time Wisely	614	37.51	10
Use Technology to Advantage	357	21.81	17
Take Care of One's Self	906	55.35	5
Read, Read, Read	879	26.85	16
Improve Writing Skills	804	49.11	6
Analyze Existing Research	598	36.53	12
Decide on Research Design	269	16.43	18
Ground Oneself in Research	608	37.14	11
Listen to the Data	483	29.51	15
Stay Focused	522	31.89	13
Account for Biases	620	37.87	9
Collaboration	1271	77.64	3
Draw on the Details	246	12.03	19
Participation to Research Trainings	1380	84.30	1
Manage Finances	499	30.48	14
Learn Study Skills	681	38.55	8
Be Realistic	792	48.38	7

Here are the suggested solutions of the respondents on the challenges met in conducting research.

Participation to Research Trainings (84.30%)

The majority of respondents recommend attending and participating in research trainings to get new information and skills in doing research and to stay up to date on current advancements in the field. Furthermore, this will boost instructors' self-esteem, drive, and confidence. This provides an appropriate route for teachers to clarify specific concepts and seek assistance with the sections of the research that are tough to deal with. Those who already have research proposals will be able to confirm the correctness of their work or polish some aspects of their proposal to make it better.

> "The training would be better if it will be endorsed by the supervisor or the superintendent so that our attendance to trainings are official", said one of the respondents when asked to participate in a research training.

School- based Mentoring (78.31%)

Respondents advised school-based mentorship because they did not want to go anywhere because it would cost them a lot of money. They would rather be mentored by someone who is a research enthusiast or a school expert. They can do this as part of their School Learning Action Cell (SLAC) Program. They can also invite experts to speak about research during their SLAC program. The school administrator can also obtain resource materials such as journals, research books, and other resources required for performing research in order to assist teachers who wish to undertake research activities in their schools.

Collaboration to Other Institutions (77.64%)

Another key suggestion of respondents is to collaborate with other organizations that can broaden the knowledge and skills in conducting research, such as researchers from higher education institutions in Masbate Province. This is exactly what other schools are doing to encourage their teachers to become involved in research. Often, the collaborating organizations discover mutual interests in research challenges and work together to pursue a specific research project. This also aids in the establishment of a harmonious partnership with other institutions that have the same vision and goals.

Manage Resources Wisely (64.94%)

Common to the suggested responses of the respondents in curtailing obstacles in conducting research is by managing resources wisely. In so far, this is one of the most important things that a researcher should bear in mind. Managing time, finances, materials and other resources necessary to your study will lead your research journey to success. Clear goals should be in mind. There should be plans for all the activities to be conducted and timelines. You should be properly guided with what to do by consulting experts and reading a lot of what to do.

Take Care of One's Self (55.35%)

Commonly most of the respondents were also concern with their health. Of course, no one would like health problems while doing research. This will just create another big problem in your research journey or worst could be a reason to quit pursuing research. This was supported by one of the suggestions coming from the respondents when he said,

"Researchers should look into their health while they are pursuing the study."

Maintaining a good emotional, physical and spiritual shape is very much important to function well mentally. But there are times when you need to slow down because of mental, emotional and physical signs (Muirhead, 2005, p.23). When you become so busy with your study, you forget about exercising regularly. This can lead to gaining unnecessary weight and/or makes your brain function not at its full potential because of lack of exercise. Researchers should pay attention to their body when working overtime, use healthy diet and hydration, and seek help from experts for mental, physical, emotional and spiritual needs. Most importantly, researchers should spend time with loved ones.

Improve Writing Skills (49.11%)

Research is all about reading and writing and so researchers need to improve both in those areas. Improving these areas will help lift up struggles in conducting research. There are several practical ways which can help improve your writing skills. Researchers should read several journal articles. They need to expose their brain in the different journal articles and research studies. Exposing themselves to these will help adapt or use the same scholarly writing style. They need to notice the trend of style used in the different articles.

Asking for help to correct the work is essential. The feedbacks created will contribute in polishing the work. In writing manuscript always use complete sentences throughout the whole study. Each sentence must present complete thought. Each of the parts in the research should be checked for coherency. Furthermore, in all the sections, chapters and paragraph it should be kept simple, structured and sweet. You have to avoid informal concepts and language because a research study is a formal academic document. In writing a research study, there is a need not to use flowery words. You should say a lot in a few words. Moreover, you should use technical concepts appropriately and consistently and should also avoid plagiarism and anthropomorphism.

Be Realistic (48.38%)

The respondents suggest this with emphasis.
"In coming up with a research study, it must be specific, measurable, attainable, result- oriented and time bound (SMART)."

You should not be too ambitious in crafting your research proposal. It must be something that you are familiar with and that is realistic. You conduct research not because you want to impress but primarily because there is an existing problem that you want to solve. Always think of your goals in planning and in all the activities that you want to pursue because everything will be wasted once your study is not realistic.

Learn Study Skills (38.55%)

Individual learners learn at a different level and styles. This suggested intervention of respondents will help researchers to become more knowledgeable in studying the topic in their research study. Along the way of pursuing research, you will eventually learn new study skills and you have to embrace these skills because it will greatly help you in handling your research.

Account for Biases (37.87%)

The findings also revealed that respondents would account for their own prejudices. They must handle the information in a reasonable manner. The evidence must support the findings, not the teachers' point of view. With the right data, the right interventions can be implemented. It must be valid, trustworthy, and relevant. They also see the concept of immersing oneself in research as a way to gain a deeper understanding of how to do research.

Manage Time Wisely (37.51%)

One of the major reasons why teachers struggle to complete a research study is the lack of self-discipline in time management. The average time to complete a research study is 6 to 9 months (Wa-Mbaleka, 2016). Sometimes being good in managing time is part of personality and not everyone has it but it can be learned. One of the respondents uttered that,

"If we want to manage time wisely, we need to have clear goals and timeline."

The need to have timeframe for all the activities towards completing the targets is of importance. They need to see to it that tasks will be completed in a timely manner. The need to give some allowance of time is needed so as not to be disheartened when they would unable to meet deadlines.

Respondents suggest the need to work on intentional plan to help researchers move forward with the research study. Idle moments should be avoided and everyone should get in the right priority. Researchers should not have the habit of always missing with the deadlines. They need to be in love with their research study and nurture that relationship in a consistent basis. They must also need to use some practical strategies.

Ground Oneself in Research (37.14%)

Conducting research to some is very easy because they are fully equipped with the knowledge, skills and attitudes in conducting research. One of the interviewees commented that,

"When you conduct research, you have to ground yourself on it. You should decide it with your heart."

This identified suggestion implies that researchers should embrace research with all their hearts, minds and actions. You should be eager to acquire current knowledge about research. Having the full grasps of what to do in your study is a major ingredient to your success.

Analyze Existing Research (36.53%)

If you want to see things that are not usually seen in your research study you need to dig deeper. You need to analyze the literature of your study. You need to link existing research to your topic and synthesize the available research systematically. Synthesis could be thematic. Another way is to analyze the methodical practices of the different studies. You need to place the researches in a chronological order within the existing body to become successful. You can also design a literature review map so that readers can easily see a large selection of your sources on a map of just one page and synthesize the research methods commonly used. By reading different studies you can find and present conflicting research studies. Sometimes, there are discrepancies discovered in previous studies and that needs personal analysis. Critiquing the research studies that have been written so far will address the weaknesses separately throughout the review of related literature. Some good places to find weaknesses of published work include, but are not limited to, the research methods, data analysis, data interpretation, and the conclusion.

Stay Focused (31.89%)

As the researcher continue to conduct the study, many data and findings will eventually lead you to many interesting parts of your study. You want to include almost everything that interests you unknowingly that you are going somewhere away from your topic. According to a teacher researcher in the DepEd,

> "Even incremental progress is enough. You always have to give focus on what you are doing. Always think of those reasons why you have started conducting research anyway."

Sometimes you will also feel like you don't want to continue with it anymore because you are bombarded with so much thing to think of and accomplish.

Manage Finances (30.48%)

Conducting research is sometimes costly and you really have to manage your financial resources wisely. You need to design a study that fits within your financial means. Keep in mind that you would probably spend more than what you have budgeted for. This happens often so you should avoid designing something that, to start with, is already out of your financial reach.

Listen to the Data (29.51%)

One of the most important suggestion of the respondents is to account for biases. Once the data is already at hand you have to strongly keep in mind to put aside your biases. Do not try to modify the data and findings that go against your expectations. One of the interviewees raised this statement,

> "Always present the data accurately and discuss the facts not just assumptions."

Do not try to overgeneralize and lie to your readers. Report your exact findings.

Read, read and read (26.85%)

The majority of respondents said they read a lot to overcome the problems they had when performing research. Reading is one of the most important activities in a research journey. It is difficult to start writing without reading. Completing a research study is purely about reading and writing and communicating with people. Writing research study will greatly suffer without ways of collecting, managing and digesting what have been read in the reading materials.

To become expert in a topic you need to read anything or everything that is related to your study. You need to discuss the research study from all different perspectives.

Respondents suggest that just by skimming sources researchers can tell whether the articles and books are of good quality and seems to be at the heart of the topic. Respondents suggest to read over and over again to capture underlining important portions reflecting the piece from the different angles. The researcher should have the ability to improve and contrast the pieces of relevant ideas to the topic.

Reading different sources of information like theses and dissertation can help get used to how people write on their research studies. Researchers need to be selective of what's going to be included in the research study. Furthermore, it should be backed up with sound evidence or reasoning.

Use Technology to Advantage (21.81%)

Technology is very useful in writing your research paper. These can help save time in thinking about the study you want to pursue such as computer, personal memos, saving devices, cloud storage, Mendeley, EndNote, Microsoft Word, You Tube, Online datasets, instruments and many more. One of the respondents reiterated that,

"It's such a waste of time to have to write long pages on paper and then later on transcribe everything on the computer. That's doing the same thing twice."

Researchers must also use personal notes because ideas come at unexpected times and in all different kinds of settings. As soon as you get back to your computer you can transfer those ideas to your research paper. When using computer, you also need to be extra careful since if you failed to save the documents it can never sound like the original work. Save your files in external drive or in your computer every time you write. Furthermore, saving the document in other similar online services will help you continue to work on your manuscript from any computer that is connected to the internet. There is also software that can help you manage easily your references or bibliography. Moreover, YouTube can help you access lectures on a topic, research design or some data collection methods. But you have to be careful in selecting your sources. Do not limit yourself, you can also try using other technology tools you know from someone else.

Decide on Research design (16.43%)

The research design is the ship that takes the study to a successful journey. It is the heart of our research study. This is the portion where the researcher can successfully plan and execute a research study independently. The topic and the research questions must dictate the selection of research design. Cite experts of that design as you discuss the chapter 3 of your study. The researcher must read extensively about the selected research design and be consistent with it throughout the study.

Draw on the Details (12.03%)

Draw on the details. Do not be swayed by your own misconceptions. Present the data truthfully, logically and convincingly. Think of your data from all different perspectives until you fully understand your study. This will help you to get to know more about your study, what it means to the audience and to both practitioners and theorists.

The suggested interventions of the respondents must be considered and should have bearings on the output of this research study in order to solve problems and encourage teachers to conduct research, which will lead to an increase in research performance and productivity in the Division of Masbate Province, as well as an impact on teaching and learning in schools and the improvement of students' critical thinking.

Conclusion and Recommendations

In this time of pandemic, in the field of education many should have been part in performing research if most of the teachers are capable enough to pursue a research endeavor to solve problems arising in their respective workplace. In this study as it was revealed, according to statistical measures, the public elementary and secondary school teachers in the Province of Masbate are only "slightly capable" of performing research. It is imperative, therefore, that teachers should participate in research capability enhancement programs. Furthermore, most of the respondents lacked scientific training in conducting research and struggled to control their time, resulting in a very low percentage of research productivity. Lack of scientific training is their main problem encountered in conducting research followed by mismanagement of their time. The data also showed that most teachers do not experience colleague conflict and are not challenged to pursue study due to lack of incentives to do so. The best intervention proposed by respondents in conducting research is to participate in research training, indulge in school-based mentoring and promote collaboration with experts. Wise resource management was also suggested. Time, money, methods, and materials are only a few of the resources that must be wisely handled in order to devote some of the time and effort to research.

In light of this, the researchers would like to recommend that the officials of the Department of Education, especially in the Division of Masbate Province, may conduct a research capability enhancement program to improve teachers' capability in conducting research especially on the following indicators wherein the respondents are slightly capable and not capable. Furthermore, teachers in public secondary schools may be provided with scientific and time management trainings in conducting research. The Division of Masbate Province may also intensify school-level mentoring and promote research endeavor collaborations with institutions highly performing in research within the Province of Masbate. Moreover, they may also consider to enforce the acquisition, creation, and distribution of updated research guides to teachers in order to provide them with the necessary information, skills, and values that will contribute to high research productivity and effective teaching of research subjects to students to acquire the necessary skills.

Acknowledgement

The researcher wishes to extend sincere thanks to his peer reviewers for informative reviews on numerous revisions and thorough research course tracking. For, the love, encouragement and invaluable assistance of his family. The monetary assistance extended by Dr. Emilio B. Espinosa, Sr. Memorial State College of Agriculture and Technology to realize this endeavor. The respondents who shared time in responding to the survey. Friends and others, for the constructive participation and to whom he is profoundly indebted, his loving, caring and compassionate parents. Above all, the almighty God, for the wisdom, power, peace of mind, good health and innumerable blessings He has bestowed upon this effort to success.

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BSE Mathematics Program Performance of Cavite State University-Tanza Campus in the Licensure Examination for Teachers: Basis for LET Math Equation Model

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Abstract - A mandatory requirement for Teacher Education graduates to teach, is to pass the Licensure Examination for Teachers as stipulated in Republic Act No. 7836, which promotes the development and professionalization of teachers. The study was conducted to evaluate the performance of the BSE Mathematics program of Cavite State University Tanza Campus in the Licensure Examination for Teachers, to formulate a mathematical equation model that would help forecast the passing percentage of the BSE Mathematics graduates of the institution. The study used the descriptive-predictive correlational research design. Complete enumeration was employed in this study since the BSE Math major graduates of the campus were relatively small. It was revealed that High School General Weighted Average, Grade Point Average in the undergraduate (Professional Education subjects, Major subjects, General Education subjects), and Mathematics attitudes in terms of enjoyment; fear and anxiety; perceived relations to real-world; and independence in learning were significant predicting variables in forecasting the LET rating score. Investigation on math attitude containing other indicators may also be conducted. Likewise, a similar study may be conducted to many respondents considering other variables not mentioned in this study.

Keywords - Teacher education, Math attitude, LET performance, Mathematical equation model

Introduction

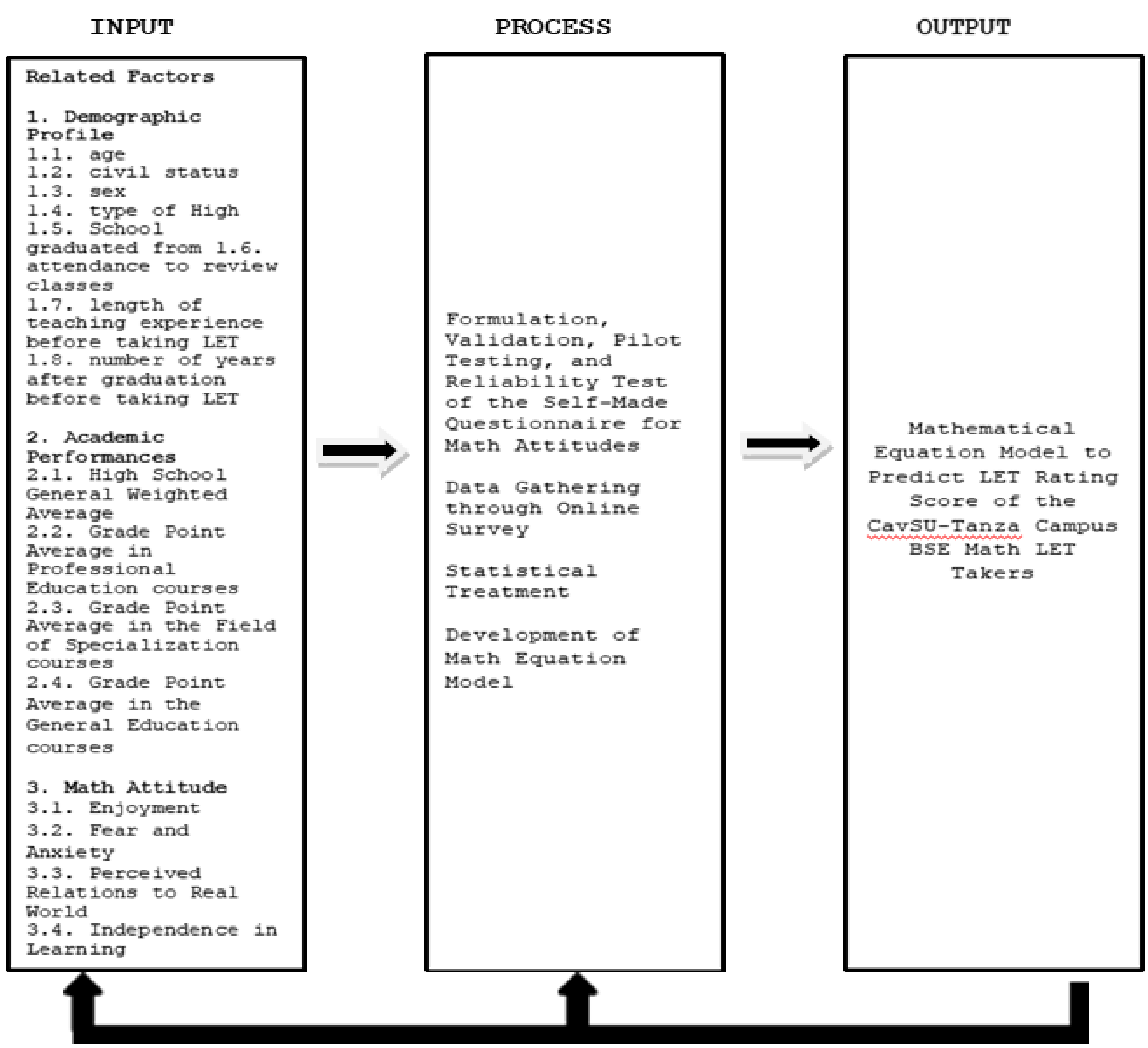
Education is the key to a bright and prosperous country that seeks compromise contribution of all citizens to embrace the richness and possibilities that nations diversity affords as the upcoming generation approaches, according to Bill Clinton (1995). Education represents learning and development; it is considered one of the most critical factors that contribute to the development of society. Proper education is only gained at school, a school where the students and teachers meet. In school, the teachers are the most significant persons because they are the transmitter and facilitators of learning. In the Philippines, the primary mission of Teacher Education is the preparation of globally competitive teachers who are imbued with ideals, aspiration, and sufficiently equipped with pedagogical knowledge and skills (CHED Memorandum Order No.11, 1999). A professional teacher possesses competence in their chosen field to serve their mission which means they are equipped with technical knowledge. The LET performance is one of the determinants of a teacher's competence and safe job performance. The statement of Abad (2004), "Education of the Youth is the Foundation of Every State," recognized the vital role of teachers in nation-building. Measuring the quality education among Teachers Education Institutes (TEI) in the Philippines is to pass the Licensure Examination for Teachers (LET) Visco, D. (2015). The Republic Act 7836, also known as the Teachers Professionalization Act of 1994, promotes the development and professionalization of teachers. It was a task to strengthen the supervision and regulation of the teaching profession. The Professional Regulation Commission (PRC) supervised and regulated Board Licensure Examination for Professional Teachers (BLEPT). The PRC then prescribed the Licensure Examination for Teachers. According to Antiojo, L.P. (2017), the Republic Act 7836 believed that passing the Licensure Examination for Teachers can improve the quality of teaching since it is assumed that LET is a good measure of competency reflected in the National Competency-Based Teacher Standard (NCBTS). Article IV Section 27 under this act stipulates that" no person shall practice or offer to practice the teaching profession without having previously obtained a valid certificate of registration and a valid professional license from the Commission.

The Cavite State University is known for its mission to produce professional, skilled, and morally upright individuals for global competitiveness. In this matter, the Cavite State University Tanza Campus is a new satellite campus that shall maintain the university's prestige. The Bachelor of Secondary Education graduates must pass the Licensure Examination for Teacher (LET) to practice their profession and honor and reputation to the University. This study aims to evaluate the performance of the BSE Mathematics program of Cavite State University Tanza Campus in the Licensure Examination for Teachers (LET), which will be the basis for formulating a mathematical equation model that would help forecast the passing percentage of the BSE Math graduates of the University.

Conceptual Framework

The framework illustrates how the concepts were interrelated and somehow shows the flow on achieving the study's objectives.

The input variables are the following: age, civil status, sex, types of school graduated from, general weighted average obtained in high school, GPA in professional education courses, GPA in the field of specialization, GPA in general education courses, attendance to review classes, length of service before taking the examination and the math attitudes of the LET takers.



Feedback

Figure 1. Conceptual Framework of the Study

The process includes the formulation, validation, and reliability testing of the questionnaire, data collection through an online survey via a google form, followed by data analysis and interpretation, the derived results, and the development of the mathematical equation model. Thus, the output of the study would be the Mathematical Equation Model to predict LET rating score of the CavSU-Tanza campus BSE Math LET takers.

Statement of the Problem

The primary purpose of this study was to evaluate the BSE Math Program Performance of Cavite State University Tanza Campus in the Licensure Examination for Teachers basis for the development of the LET Mathematical Equation Model.

Specifically, the study aimed to answer the following questions:

1. What was the demographic profile of the respondents before taking the Licensure Examination for Teachers in terms of Age, Civil status, Sex, Type of High School graduated from, High School General Weighted Average, Professional Education courses Grade Point Average, Field of Specialization courses Grade Point Average, General Education courses Grade Point Average, Attendance to review classes, Length of teaching experience before taking the LET, and Number of years after graduation before taking the LET?
2. What was the math attitude of the LET-taker respondents towards learning in terms of Enjoyment, Fear and Anxiety, Perceived relations to real world, and Independence in learning?
3. What was the performance of the LET-taker respondents of CvSU Tanza Campus in the following areas General Education, Professional Education; and Field of Specialization?
4. Is there a significant relationship between the LET performance and math attitude of the LET taker-respondents?
5. Is there a significant difference in the LET performance of the respondents when grouped according to their demographic profile?
6. Based on the results, what mathematical equation model may be formulated?

Hypotheses

1. There is no significant relationship between the LET performance and math attitude of the LET taker-respondents.
2. There is no significant difference between the LET performances of the respondents when grouped according to their demographic profile.
3. There are no viable predictors to forecast the LET rating score.

Scope and Limitation of the Study

The study focused on the Bachelor of Secondary Education Mathematics Program of Cavite State University Tanza campus in its Performance in the Licensure Examination for Teachers for the last five (5) years. The scope of this study includes the demographic profiles of individual LET takers, the math attitude of the LET taker towards learning in terms of enjoyment, fear and anxiety, perceived relations to real world, and independence in learning, and the LET performance of the LET takers in these areas; Major Field, Professional Education, and General Education. The data yield from this study was used as the basis for the development of the LET math equation model. The respondents of the study were the BSE major in Mathematics graduates of Cavite State University Tanza campus from 2016 to 2020, who took the Licensure Examination for Teachers from March 2017 onwards. The duration of the study was from February 2021 to May 2021.

Significance of the Study

This study would be beneficial to the students and the faculty, curriculum developer, Teacher Education Institutions, administrators, and future researchers.

Methodology

Research Design

The study used the descriptive-predictive correlational research design. According to Locharoenrat (2016), a descriptive correlational study describes the variables and the relationships that occur naturally between and among them. A descriptive correlational study predicts the variance of one or more variables based on the variance of another variable(s). The study variables are classified as independent (predictor) and dependent (outcome) as with experimental designs. However, these variables are not manipulated but occur naturally. The descriptive method was used to describe the respondents' mathematics attitude, academic performances, and LET performances in the present study. In addition, the correlation was used to test the significant relationship among variables which led to the development of a mathematical equation model, which serves as the predictive analysis design.

Population and Sampling

There is no sampling method utilized in this study. Complete enumeration was employed since the BSE Math major graduates of Cavite State University Tanza campus were relatively small, and each of the members of the population was included.

Respondents of the Study

The respondents of the study are composed of graduates of Cavite State University Tanza campus from 2016 onwards who took the Licensure Examination for Teachers major in Mathematics regardless of if they passed or failed.

Research Instruments

The study used a self-made questionnaire. The instrument contains two parts:

Part I. Demographic Profile of the Respondents. The respondents were asked about their personal information composed of parameters such as age, civil status, sex, type of high school graduated, average grade obtained in high school, GPA in their subjects in college, length of teaching experience, attendance to review class, and number of years after graduation before they took the LET.

Part II. Mathematics Attitude of the LET takers. The instrument was composed of twenty-four (24) statements further divided into four factors, namely (a) Enjoyment, (b) Fear and Anxiety, (c) Perceived Relations to real world, and (d) Independence in Learning. A 7-point semantic differential scale was used as the basis for interpretation of data.

Data Gathering Procedures

The researcher secured permission from the University President to conduct the study. Then, she sought help from five (5) experts to validate the research instrument. The team was composed of two (2) PhD candidates for Mathematics, two Head Teachers for Math programs from DEPED, and one (1) Doctor in Psychology. Next, she conducted pre-testing to thirty-one (31) LET takers of similar characteristics to the real respondents to check the instrument's reliability. A Cronbach's alpha was used, and an alpha of 0.722 was obtained. Thus, it only shows that the instrument was valid and reliable. After which the researcher administered and retrieved the research instrument from the respondents. Finally, the collected data was sorted, tallied, presented, and analyzed. The researcher was able to formulate a mathematical model based on the results.

Statistical Treatment of the Study

The following statistical tools were used in the analysis and interpretation of data. Weighted Mean to get the average responses of the respondents. Standard Deviation to measure the amount of dispersion of a set of values collected. Pearson Product Moment Correlation to calculate the effect of change in one variable when the other variable changes. T-test for Two Independent Samples used to test the significant differences between two groups. Analysis of variance (ANOVA) used to test the significant differences between three or more groups. Linear Regression Analysis used to assess the association between two or more independent variables and a single continuous dependent variable.

Results and Discussions

Table 1. Distribution of the respondents as to age

Age	Frequency	Percentage
31 years and above	2	11.8%
21-30 years	4	23.5%
20 years and below	11	64.7%
Total	**17**	**100%**

Table 1 presents the distribution of the respondents according to age. Almost two-thirds (or 64.7%) of the respondents were 20 years old and below when they entered college. The remaining 23.5% and 11.8% were between 21-30 years old and 31 years old and above, respectively.

Table 2. Distribution of respondents as to civil status

Civil Status	Frequency	Percentage
Married	2	11.8
Single	15	88.2
Total	**17**	**100%**

As shown in Table 2 for the distribution of respondents as to civil status, 88.2 percent of the respondents were single, while 11.8 percent were married when they were in college.

Table 3. Distribution of Respondents as to Sex

Sex	Frequency	Percentage
Female	12	70.6%
Male	5	29.4%
Total	**17**	**100%**

Table 3 shows the distribution of the respondents according to sex. It displays that most of the respondents were female or comprising 70.6% of the respondents, and only 29.4% were male.

Table 4. Distribution of the respondents as to type of high school graduated from

Type of High School	Frequency	Percentage
Private	4	23.5%
Public	13	76.5%
Total	**17**	**100%**

As shown in Table 4, most of the respondents took their high school in public schools. To be exact, 76.5 percent of the respondents were from public schools, while only 23.5% were from private schools.

Table 5. Distribution of the respondents as to high school GWA

HS Grading Scale	Description	Frequency	Percentage
90 - 100	Excellent	5	29.4%
85 – 89	Very Satisfactory	9	52.9%
80 - 84	Satisfactory	3	17.6%

Table 5 presents the respondents' GWA in high school. It shows that 29.4 percent of the respondents had an average grade of 90 to 100, while 52.9 percent of the respondents had an average grade of 85 to 89, and the remaining respondents had an average grade of 80 to 84.

Table 6. Distribution of the respondents as to GPA in professional education subjects

Grading Scale	Description	Frequency	Percentage
1.00 – 1.25	Marked Excellence		
1.26 – 1.75	Very Good	11	64.7%
1.76 – 2.00	Good	4	23.5%
2.01 – 2.75	Satisfactory	2	11.8%
2.76 - 3.00	Passing		
Total		**17**	**100%**

Table 6 reveals that 64.7 percent of the respondents had a GPA between 1.26 to 1.75 in Professional Education Subjects, 23.5 percent are between 1.76 to 2.0, and 11.8 percent are between 2.01 to 2.75.

Table 7. Distribution of the respondents as to GPA in major subjects

Grading Scale	Description	Frequency	Percentage
1.00 – 1.25	Marked Excellence		
1.26 – 1.75	Very Good	11	64.7%
1.76 – 2.00	Good	4	23.5%
2.01 – 2.75	Satisfactory	2	11.8%
2.76 - 3.00	Passing		
Total		**17**	**100%**

Table 7 presents the distribution of the respondents according to GPA in Major subjects. It reveals that 64.7 percent of the respondents had a grade of 1.26 to 1.75, 23.5 percent are between 1.76 to 2.00, and 11.8 percent are between 2.01 to 2.75. Likewise, 88.2 percent of the respondents had a GPA not lower than a grade of 2.0 in Major subjects.

Table 8. Distribution of the respondents as to GPA in general education subjects

Grading Scale	Description	Frequency	Percentage
1.00 – 1.25	Marked Excellence		
1.26 – 1.75	Very Good	10	58.8%
1.76 – 2.00	Good	4	23.5%
2.01 – 2.75	Satisfactory	3	17.7%
2.76 - 3.00	Passing		
Total		**17**	**100%**

As shown in Table 8, 58.8 percent of the respondents had a general point average in general education subjects between 1.26 to 1.75, 23.5 percent of them got a GPA between 1.76 to 2.00, and 17.7 percent between 2.01 to 2.75. Thus, it reveals that 82.3 percent of the respondents had a grade point average of not lower than 2.0 in general education subjects.

Table 9. Distribution of the respondents as to attendance to review classes

Attendance to Review Classes	Frequency	Percentage
Attended	5	29.4%
Did not Attend	12	70.6%
Total	**17**	**100%**

As shown in Table 9, 70.6 percent of the respondents were not able to attend review classes before they took their Licensure Examination for Teachers. On the other hand, only 29.4 percent of them attended review classes before taking the Licensure Examination for Teachers.

Table 10. Distribution of the respondents as to length of teaching experience before taking the LET

Length of Teaching Experience	Frequency	Percentage
Less than one year	11	64.7%
1-2 years	6	35.3%
Total	**17**	**100%**

Table 10 presents the distribution of the respondents as to their length of teaching experience before taking the LET. It shows that 64.7 percent of the respondents had a teaching experience of less than one (1) year before they took their Licensure Examination for Teachers, the 35.4 percent of the respondents had a teaching experience between one (1) to two (2) years in the field.

Table 11. Distribution of the respondents as to number of years after graduation before taking LET

Length of Time before Taking the LET after Graduation	Frequency	Percentage
Less than one year	13	76.5%
1-2 years	4	23.5%
Total	**17**	**100%**

As shown in Table 11, 76.5 percent of the respondents took their Licensure Examination less than a year after graduation, and 23.5 percent took the Licensure Examination for Teachers 1 to 2 years after graduation.

Table 12. Academic performance of the LET-taker respondents

Type of Subjects	Grade Point Average	Description
Major Subjects	1.67	Very Good
Professional Education Subjects	1.65	Very Good
General Education Subjects	1.73	Very Good
Overall Academic Performance	1.68	Very Good

Table 12 shows the academic performance of the LET-takers respondents. Based on the results obtained, major subjects have a grade point mean of 1.67. The weighted mean for the Professional Education Subjects was 1.65. Moreover, the General Education Subjects had a grade point average of 1.73.

Table 13. Enjoyment of the respondents in mathematics

Indicator	Weighted Mean	SD	Descriptive value
1. Mathematics is fun since I easily deal with.	5.240	0.831	Normally
2. I get great satisfaction in solving math problems correctly.	6.470	0.800	Usually
3. I enjoy solving math problems because it is rewarding.	6.240	0.752	Usually
4. I prefer solving math problems rather than writing essays.	5.880	1.728	Normally
5. I prefer math subjects rather than any other subjects.	6.000	1.173	Usually
6. I can easily understand the concepts in mathematics.	4.940	0.827	Sometimes
Over-all Mean	**6.000**	**0.707**	**Usually**

Table 13 shows the responses for the enjoyment of the respondents in mathematics in which the top three (3) indicators are: I get great satisfaction in solving math problems correctly (WM = 6.470; Usually); I enjoy solving math problems because it is rewarding (WM = 6.240, Usually); and I prefer math subjects rather than any other subjects (WM = 6.000, Usually). The indicator "I can easily understand the concepts in mathematics" (WM = 4.940, Sometimes) got the least weighted mean.

Table 14. Fear and anxiety of the respondents in mathematics

Indicator	Weighted Mean	SD	Descriptive value
1. ***I am afraid of math subjects.***	3.650	1.455	Seldom
2. ***I find it hard to understand topics in mathematics.***	4.180	1.185	Sometimes
3. ***Mathematics is a dull and boring subject.***	1.820	1.015	Never
4. ***I am easily bored in solving math problems.***	2.180	1.380	Hardly Ever
5. ***My mind goes blank, and unable to think clearly when working with math problems.***	3.470	1.068	Seldom
6. ***Studying math makes me feel nervous.***	3.590	1.622	Seldom
Overall Mean	**3.120**	**0.993**	**Seldom**

Table 14 shows the responses for the Anxiety and Fear of the respondents in Mathematics. Based on the results obtained, the highest indicator was: I find it hard to understand topics in Mathematics (WM, 4.180) with the interpretation of Sometimes. While the least was: Mathematics is a dull and boring subject (WM, 1.820) and is interpreted as Never.

Table 15. Respondent's perception about mathematics relations to the real-world

Indicator	Weighted Mean	SD	Descriptive value
1. I use math every day.	4.880	2.147	Sometimes
2. Math is important in our daily lives.	5.710	1.448	Normally
3. Math is everywhere and everything we senses.	6.180	1.629	Usually

4. We need math in our future life.	6.290	0.849	Usually
5. I think studying math helps me solve problems in other areas of study.	6.470	1.375	Usually
6. Mathematics nurtures my characteristics.	6.350	0.931	Usually
Overall Mean	**6.060**	**0.899**	**Usually**

Table 15 shows the responses of the respondents about mathematics relations to the real world. The Top three (3) indicators were: I think studying Math helps me solve problems in other areas of study (WM, 6.470); Mathematics nurtures my characteristics (WM, 6.350); we need Math in our future life (WM, 6.290) and all three were interpreted as usually, consecutively. While the least indicator was: I used math every day (WM, 4.880) and interpreted it as Sometimes.

Table 16. Respondent's response to math attitudes as to independence in learning

Indicator	Weighted Mean	SD	Descriptive value
1. I look for an easy way to solve math problems.	5.760	1.393	Normally
2. I can learn math even if the teacher does not explain the topic well in class.	4.350	1.618	Sometimes
3. I participate in math discussions.	4.760	1.393	Sometimes
4. I can solve math problems on my own.	5.240	1.480	Normally
5. I have my techniques in solving out math problems.	4.650	1.169	Sometimes
6. I perform well in all my math exams.	5.000	1.323	Normally
Overall Mean	**5.060**	**0.827**	**Normally**

Table 16 shows the result for the respondents' responses to Math attitude as to independence in learning. The top indicator was: I look for an easy way to solve math problems (WM, 5.760), interpreted as normally. The least indicator was: I can learn math even if the teacher did not explain the topic well in class (WM, 4.350) and interpreted it as sometimes.

Table 17. Summary table on respondent's attitudes towards mathematics

Indicator	Weighted Mean	SD	Descriptive value
1. Enjoyment	6.000	0.707	Usually
2. Fear & Anxiety	3.120	0.993	Seldom
3. Independence in Learning	5.060	0.827	Normally
4. Perceived Relations to Real-world	6.060	0.899	Usually

Table 17 gives the summary table on respondent's attitudes towards Mathematics. Perceived relations to real world being the highest (WM, 6.060 and SD, 0.899), interpreted as usually; which means 75%-99% of the respondents believed that mathematics is essential to the real world. Followed by the enjoyment (WM, 6.000 and SD, 0.707), interpreted as usually, which means 75% to 99% of the time, most respondents enjoy mathematics. Third, independence in learning (WM, 5.060 and SD 0.827, interpreted as normally, expresses that 50% to 74% of the time) or tells that most respondents were independent learners. Lastly, fear and anxiety (WM, 3.120 and SD 0.993), interpreted as seldom, emphasized that 25% to 49% of the time, most respondents experienced fear and anxiety toward mathematics.

The following tables and textual descriptions give the analysis and interpretation of the performance of the LET taker respondents in the three categories of the LET and in the LET rating performance in general.

Table 18. Success in LET at first take

Success in LET	Frequency	Percentage
Passed	14	82.35%
Failed	3	17.65%
Total	17	100%

Table 18 shows the result for the Success in LET at first take. Fourteen (or 83.35%) of the respondents were marked as passed, while 3 (or 17.65%) of the respondents Failed.

Table 19. LET Performance of BSE mathematics of CvSU Tanza campus from March 2017 onwards

Exam Schedule	LET Takers	Passed	Failed	Percentage
March 2017	3	3	0	100%
March 2018	4	4	0	100%
September 2018	1	1	0	100%
March 2019	9	6	3	66.67%

Table 19 shows the LET performance of BSE mathematics of CvSU Tanza campus from March 2017 onwards. In March 2017, March 2018, and September 2018 LET examinations, all the LET taker-respondents passed the board examination or 100% successful percentage. On the other hand, 66.76% of the LET takers passed the LET in March 2019.

Table 20. BSE Math Program LET performance of CvSU Tanza campus per subject areas

Subject Area	Mean	Standard Deviation
Major	77.88	8.601
Professional Education	78.00	6.764
General Education	79.71	6.018
Over-all Rating	**78.29**	**7.113**

Table 20 describes the results obtained by the BSE Math LET takers of CvSU Tanza Campus per subject area from 2017 to 2019. First, General Education has the highest mean of 79.71 with a standard deviation of 6.018. Then it was followed by Professional Education with a mean of 78.00 and SD of 6.764. Lastly, Major Subject got the lowest mean of 77.88 with SD of 8.601.
Overall, the mean performance of the LET takers from 2017 to 2019 has an overall mean of 78.29 with SD of 7.11.

Table 21. Test of relationship between LET performance in major subject and math Attitude

Math Attitude	Pearson Correlation	p-value	Interpretation
Enjoyment	0.059	0.822	Not Significant
Fear and Anxiety	-0.498	0.042	Significant
Perceived Relations to Real World	0.427	0.087	Not Significant
Independence in Learning	0.515	0.034	Significant

Table 21 shows the relationship between LET performance in major subjects and math attitude. The results show enjoyment and perceived relations to real-world has a p-value of 0.822 and 0.087,

respectively, which is higher than the 0.05 level of significance. Therefore, there is no enough evidence to reject the null hypothesis. Hence, there is no significant relationship between the major category performance in LET and math attitude regarding enjoyment and perceived relations to the real world.
On the other hand, the math attitude in terms of fear and anxiety, and independence learning, each has a p-value (p = 0.042; p = 0.034 respectively) less than the level of significance (a = 0.05), thus a rejection of the null hypothesis. This concludes that if the LET taker respondents felt a lower level of fear and anxiety, they would get higher math subjects in LET since it has a correlation value of -0.498. Moreover, if LET taker respondents have a high level of independence in learning tend to get higher scores in math major subjects in LET with a correlation coefficient of 0.515.

Table 22. Test of relationship between LET performance in professional education subject and math attitude

Math Attitude	Pearson Correlation	p-value	Interpretation
Enjoyment	0.106	0.686	Not Significant
Fear and Anxiety	-0.617	0.008	Significant
Perceived Relations to Real World	0.539	0.026	Significant
Independence in Learning	0.531	0.028	Significant

Table 22 shows the relationship between LET performance in professional education subjects and math attitude. The results show enjoyment has a p-value of 0.686 which is higher than the 0.05 level of significance. Therefore, there is no enough evidence to reject the null hypothesis. Hence, there is no significant relationship between the professional education performance in LET and math attitude in terms of enjoyment.

Conversely, the math attitude in terms of fear and anxiety, perceived relation to real world, and independence learning, each has a p-value (p = 0.008; p = 0.026; P = 0.028 respectively) less than the level of significance (a = 0.05), thus a rejection of the null hypothesis. This determines that if the LET taker respondents felt a lower level of fear and anxiety, they get higher scores in Professional Education in LET since it has a correlation value of -0.617. Similarly, if the respondents perceived the importance of mathematics in the real world probably tends to get a high score in professional education subjects in LET having a correlation coefficient of 0.539. Also, if LET taker respondents have a high level of independence in learning tend to get higher scores in professional education subjects in LET with a correlation coefficient of 0.531.

Table 23. Test of relationship between LET performances in general education subject and math attitude

Math Attitude	Pearson Correlation	p-value	Interpretation
Enjoyment	0.096	0.713	Not Significant
Fear and Anxiety	-0.475	0.054	Significant
Perceived Relations to Real World	0.432	0.083	Not Significant
Independence in Learning	0.412	0.100	Not Significant

Table 23 shows the relationship between LET performance in general education subjects and math attitude. Based on the results, it shows enjoyment, perceived relations to real-world and independence in learning has a p-value of 0.713, 0.083, and 0.100, respectively which is higher than the 0.05 level of significance. Consequently, there is no enough evidence to reject the null hypothesis. Hence, there is no significant relationship between the general education performance in LET and math attitude regarding enjoyment, perceived relations to the real world, and independence in learning. On the other hand, the math attitude in terms of fear and anxiety has a p-value (p = 0.054) less than the level of significance (a = 0.05), thus a rejection of the null hypothesis. This concludes that if the LET taker respondents felt a lower level of fear and anxiety, they would get higher scores in general education in LET since it has a correlation value of -0.475.

Table 24. Test of relationship between overall LET performance of CvSU Tanza campus BSE math program and math attitude

Math Attitude	Pearson Correlation	p-value	Interpretation
Enjoyment	0.096	0.713	Not Significant
Fear and Anxiety	-0.475	0.054	Significant
Perceived Relations to Real World	0.432	0.083	Not Significant
Independence in Learning	0.412	0.100	Not Significant

Table 24 shows the relationship between overall LET performance and Math Attitudes. The results show enjoyment has a p-value of 0.745, which is higher than the 0.05 level of significance. Therefore, there is not enough evidence to reject the null hypothesis. Henceforth, there is no significant relationship between the overall performance in LET and math attitude in terms of enjoyment. Oppositely, the math attitude in terms of fear and anxiety, Perceived Relations to Real World, and independence learning each has a p-value (p = 0.020; p = 0.049 p = 0.032 respectively) less than the level of significance (a = 0.05), hence a rejection of the null hypothesis. This suggests that if the LET taker respondents felt a lower level of fear and anxiety, they would get higher scores in LET as it has a correlation value of -0.556. Likewise, if LET taker respondents perceive the importance of mathematics in the real world, a high LET score can be projected. In addition, if the LET taker respondents have a high level of independence in learning tend to get higher scores in LET with a correlation coefficient of 0.569.

The following tables gave the summary analysis of the test of difference of the respondents when they were classified according to their profile variable.

Table 25. Test of Difference in the respondents' LET performance in major subject when group according to profile

Demographic Profile	Test value	p-value	Interpretation
1. ***Age***	0.034	0.966	Not significant
2. ***Civil Status***	0.014	0.989	Not significant
3. ***Sex***	-0.519	0.611	Not significant
4. ***High School Graduated From***	0.820	0.425	Not significant
5. ***Attendance to LET Review***	-1.593	0.132	Not significant
6. ***Teaching Experience before Taking LET***	0.959	0.353	Not significant
7. ***Years after Graduation before Taking LET***	-2.89	0.777	Not significant
8. ***GPA in Major Subjects***	-2.936	0.010	Significant
9. ***GPA in Professional Education Subjects***	-1.882	0.079	Not significant
10. ***GPA in General Education Subjects***	-2.725	0.016	Significant
11. ***High School GWA***	-2.626	0.019	Significant

Table 25 shows the difference in the Respondents' LET Performance in Major Subject when Group according to Profile. Abiding from the results obtained, the p-value for age, Civil Status, Sex, High School graduated from, Attendance to LET review, Teaching experience before taking LET, Years after graduation before taking the LET, and GPA in Professional Education Subjects, were found to be 0.966, 0.989, 0.611, 0.425, 0.132, 0.353, 0.777 and 0.079, respectively. Hence, p-values were found higher than the 0.05 level of significance. Thus, there is no significant difference between the LET performance in major subjects when group according to demographic profile in terms of age, civil status, sex, high school graduated from, attendance to LET review, teaching experience before taking LET, years after graduation before taking LET, and GPA in professional education subjects. Therefore, it failed to reject the Null Hypothesis. On the other hand, the p-value for GPA in; major Subjects, general education subjects, and high school average grades were 0.010, 0.16, and 0.019, respectively. Since the p-values were less than the 0.05 level of significance, all were interpreted as Significant. Thus, rejecting the Null Hypothesis. Moreover, if the LET taker has a high academic performance in the major subject, general education subject, and high school grade tends to get higher scores in the major subject in LET.

Table 26. Test of difference in the respondents' LET performance in professional education subject when group as to profile

Demographic Profile	Test value	p-value	Interpretation
1. Age	0.329	0.725	Not significant
2. Civil Status	-0.148	0.885	Not significant
3. Sex	0.697	0.497	Not significant
4. High School Graduated From	1.294	0.215	Not significant
5. Attendance to LET Review	-2.306	0.036	Significant
6. Teaching Experience before Taking LET	1.755	0.100	Not significant
7. Years after Graduation before Taking LET	0.664	0.517	Not significant
8. GPA in Major Subjects	-2.188	0.045	Significant
9. GPA in Professional Education Subjects	-2.363	0.032	Significant
10. GPA in General Education Subjects	-1.515	0.151	Not significant
11. High School GWA	-2.650	0.018	Significant

Level of Significance = 0.05

Table 26 shows the difference in the Respondents' LET Performance in Professional Education Subject when Group according to Profile. Abiding from the results obtained, the p-value for age, Civil Status, Sex, High School graduated from, Teaching experience before taking LET, Years after graduation before taking the LET, and GPA in General Education Subjects, were found to be 0.725, 0.885, 0.497, 0.215, 0.100, 0.517 and 0.151, respectively. Hence, p-values were found higher than the 0.05 level of significance, thus, there is no significant difference between the LET performance in major subjects when group according to demographic profile in terms of age, civil status, sex, high school graduated from, teaching experience before taking LET, years after graduation before taking LET, and GPA in general education subjects. Therefore, we do not reject the Null Hypothesis. On the other hand, the p-value for Attendance to LET review, GPA in major Subjects, GPA in Professional Education subject, and High School Average Grade were 0.036, 0.045, 0.032 and 0.018 respectively. Since the p-values were lower than the 0.05 level of significance all were interpreted as Significant Difference thus, reject null Hypothesis. Moreover, if the LET taker will attend LET review classes, plus a high academic performance in major subject, professional education subject, and high school grade tends to get higher scores in professional education in LET.

Table 27. Test of difference in the respondents' LET performance in general education subject when group as to profile

Demographic Profile	Test value	p-value	Interpretation
1. Age	0.140	0.870	Not significant
2. Civil Status	0.622	0.543	Not significant
3. Sex	0.217	0.831	Not significant
4. High School Graduated From	1.276	0.221	Not significant

*5. **Attendance to LET Review***	-2.796	0.014	Significant
*6. **Teaching Experience before Taking LET***	1.718	0.106	Not significant
*7. **Years after Graduation before Taking LET***	0.353	0.729	Not significant
*8. **GPA in Major Subjects***	-4.208	0.001	Significant
*9. **GPA in Professional Education Subjects***	-2.433	0.028	Significant
*10. **GPA in General Education Subjects***	-3.742	0.002	Significant
*11. **High School GWA***	-2.701	0.016	Significant

Level of Significance = 0.05

Table 27 shows the difference in the respondents' LET performance in general education subject when group according to profile. The results obtained in the p-value for age, civil status, sex, high school graduated from, teaching experience before taking LET, and years after graduation before taking the LET were 0.870, 0.543, 0.831, 0.221, 0.106, and 0.729, respectively. The p-values were found higher than 0.05 level of significance. Thus, there is no significant difference between the LET performances in general education subject and demographic profile in terms of age, Civil status, sex, High school graduated from, teaching experience, and years after graduation before taking LET. Therefore, we cannot reject the null hypothesis. Whereas the p-value for Attendance to LET review, GPA in major Subjects, GPA in Professional Subjects, GPA in General Education, and High School were 0.014, 0.001, 0.028, 0.002, and 0.016, respectively. Since the p-values were lower than the 0.05 level of significance, all were interpreted as Significant. Therefore, reject the null Hypothesis. Furthermore, if the LET taker will attend LET review classes, and higher academic performance in major subjects, professional education subject, general education subject, and high school grade will likely get higher scores in general education in LET.

Table 28. Test of difference in over-all LET results according to profile

Demographic Profile	Test value	p-value	Interpretation (a = 0.05)
*1. **Age***	0.020	0.981	Not significant
*2. **Civil Status***	0.154	0.880	Not significant
*3. **Sex***	0.049	0.962	Not significant
*4. **High School Graduated From***	1.102	0.228	Not significant
*5. **Attendance to LET Review***	-2.105	0.053	Not significant
*6. **Teaching Experience before Taking LET***	1.409	0.179	Not significant
*7. **Years after Graduation before Taking LET***	0.170	0.868	Not significant
*8. **GPA in Major Subjects***	-2.933	0.010	Significant
*9. **GPA in Professional Education Subjects***	-2.233	0.041	Significant
*10. **GPA in General Education Subjects***	-2.449	0.027	Significant
*11. **High School GWA***	-2.779	0.014	Significant

Table 28 shows the Difference in over-all LET results according to profile. The results obtained for a p-value of age, civil status, sex, high school graduated from, attendance to LET review, experience before taking LET, and years after graduation before taking the LET were 0.981, 0.880, 0.962, 0.228, 0.053, 0.179, and 0.868, respectively. Hence, p-values were found higher than the 0.05 level of significance. Thus, there is no significant difference between the overall LET rating and respondent's demographic profile as to age, civil status, sex, high school graduated from, attendance to LET review, and experience before taking LET and years after graduation before taking the LET. Therefore, we cannot reject the Null hypothesis. However, the p-value for GPA in Major subject, GPA in Professional subject, GPA in General Education subject, and

High School GPA found to be 0.010, 0.041, 0.027, and 0.014, correspondingly. Consequently, the p-values were found lower than the 0.05 level of significance. Hence, we can reject the null hypothesis. Additionally, if the LET taker obtained a higher academic performance in major subject, professional education subject, general education subject, and high school grade, possibly tend to get a higher rating in LET.
To formulate a mathematical equation model to predict the LET rating score, the study used linear regression analysis, as shown in the following table.

Table 29. Test of significance of the mathematical equation model

Model	R	R Square	F-value	p-value	Decision	Interpretation
Mathematical Equation	0.961	0.924	12.107	0.001	Reject	Significant

Table 29 gives the summary table analysis of the regression of the mathematical equation model. The table shows that the model has an R-value of 0.961 that gives an R-squared of 0.924. Consequently, 92.4% of the response variable variation that the derived linear model could explain. Graphically, the linear model is shown in Figure 2. The figure describes how close the data are to the fitted regression line. Moreover, the computed F-value of 12.107 gives a corresponding p-value of 0.001, which is very small compared to the significance level of 0.05. Therefore, the derived mathematical equation model is significant to predict the LET rating score of the CvSU LET takers based on the given predictors such as grade point average in Math subjects, Professional subjects, and General Education subjects, High School GWA, and the Math attitudes of the LET takers. On the other hand, the following table shows the coefficients of each predicting variable, including the constant term of the mathematical equation model.

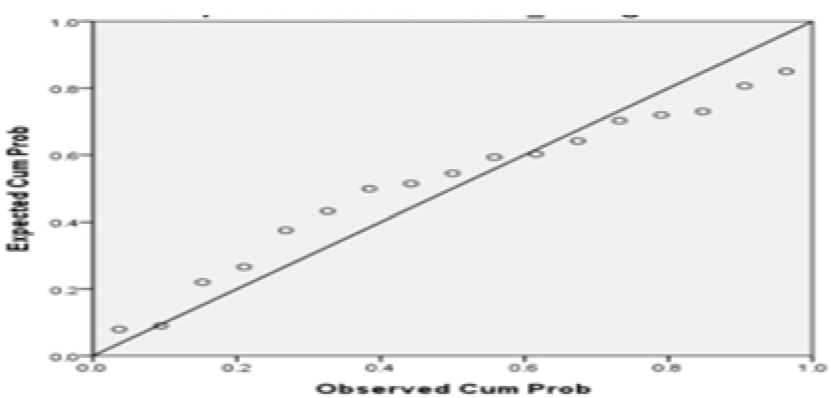


Figure 2. The Linear Model Comprising the Eight Predictors (Independent Variables)

Table 30. Derived coefficients for the mathematical equation model

Variables	Unstandardized Coefficients Beta	Standardized Coefficients Beta	t-value	p-value
Major Subjects GPA	13.215	0.515	1.518	0.167
Professional Subjects GPA	-7.726	-0.262	-0.889	0.400
General Education Subjects GPA	2.531	0.091	0.320	0.757
High School GWA	0.659	1.429	2.923	0.019
Math Attitude: Enjoyment	0.992	0.087	0.711	0.497
Math Attitude: Fear & Anxiety	1.720	0.222	1.352	0.213
Math Attitude: Perceived Relations in Real World	0.478	3.768	3.426	0.009
Learning Independence	0.223	0.023	0.149	0.885
Constant	-92.474		-2.181	0.061

Level of Significance = 0.05

Table 30 gives the derived coefficients to formulate the mathematical equation model. Among the variables, major subjects GPA, Professional subject GPA, General Education subjects GPA, Enjoyment, Fear and Anxiety, and Learning Independence would use unstandardized coefficients beta since each of its corresponding p-values is higher than 0.05 level of significance. On the other hand, the coefficients for High School GWA and the perceived relations in the real-world (math attitude) are the standardized coefficients beta since the corresponding p-value is lower than the significance level (0.05). Therefore, the mathematical equation model is now given in Equation 1:

$$y = 13.215M - 7.726P + 2.531GE + 1.429HS + 0.992E + 1.720FA + 3.768PR + 0.223L - 92.474$$

Equation 1
where:

M = major subjects grade point average
P = professional subjects grade point average
GE = general education subjects grade point average
HS = high school general weighted mean
E = enjoyment (math attitude category)
FA = fear and anxiety (math attitude category)
PR = perceived relation to real world (math attitude category)
L = learning independence (math attitude category)

Each of the predictors was paired with LET rating score to obtain the best predictors of the LET Rating score, and the results are shown in the following table:

Table 31. Test of significance of the predictors

Predictors	R	R-Squared	p-value	Interpretation
Major Subjects GPA	0.839	0.704	0.000	S
Professional Subjects GPA	0.802	0.644	0.000	S
General Education Subjects GPA	0.749	0.561	0.001	S
High School GWA	0.766	0.587	0.000	S
Math Attitude: Enjoyment	0.085	0.007	0.745	NS
Math Attitude: Fear & Anxiety	-0.556	0.309	0.020	S
Math Attitude: Perceived Relations in Real World	0.485	0.235	0.049	S
Math Attitude: Learning Independence	0.521	0.271	0.032	S

Legend: R – Pearson Correlation Coefficient S – Significant NS – Not Significant

Table 31 summarized the significance of the predictors when they were paired with the LET rating score. It is found out that the best predictors were (1) Major Subjects GPA (R = 0.839, Significant), (2) Professional Subjects GPA (R = 0.802, Significant), (3) High School GWA (R = 0.766, Significant), (4) General Education Subjects GPA (R = 0.749, Significant), (5) Math Attitude in terms of Fear and Anxiety (R = -0.556, Significant), (6) Math Attitude in terms of Learning Independence (R = 0.521, Significant), and lastly (7) Math Attitude in terms of Perceived Relations in Real World (R = 0.235, Significant).

Conclusion and Recommendations

Conclusions

Based on the findings of the study, most of the respondents were 20 years old and below when they entered college; single when they were in college; female; graduated from public high schools; with HS GWA of 85 – 89, with GPA ranging from 1.26 to 1.75 in professional education subjects, major subjects, general education subjects; did not attend review classes; less than one-year teaching experience before taking the exam; less than one year after graduation before they took the board examination for teachers; and performed very good during college. The respondents usually enjoyed mathematics; they seldom experienced fear and anxiety towards math problems; they perceived that math has relations to the real-world; and they normally ensure independent learning. On the other hand the overall weighted mean score in their LET results was "passing" but less than 80%. Then, overall rating score in LET is significantly correlated with fear and anxiety, perceived relations to the real-world, and independence in learning. Additionally, the respondents differ in LET performance when grouped according to their GPA in major subjects; GPA in professional education subjects; GPA in general education subjects; and high school GWA. Finally, a large percentage of 92.4% of the response variable variation that a linear model could explain at 0.05 level of significance.

Recommendations

Based on the findings and conclusions presented, the following recommendations were given:

1. A similar study focusing on math attitude containing other indicators may be conducted.
2. A similar study may be conducted to large numbers of respondents considering other variables not mentioned in this study such as entrance exam result and SAT results.
3. Develop a sense of independence in learning mathematics subjects, overcome fear and anxiety towards mathematics, and realize the essence of mathematics in the real world. These factors are great predictors in the licensure examination.
4. The learners should treat the three subject areas, namely, General Education, Professional Education, and Major field, of equal importance.
5. The learners may use the developed math equation model to predict their probability of passing the LET.
6. The administrators should propose an action plan for those students predicted to fail the Licensure Examination for Teachers.

Acknowledgement

This masterpiece was once a dream, but now a reality. Writing this research had a big impact on me and I would like to reflect on the people who have helped and supported me so much throughout this period. First, to my very supportive co-author and mentor, Prof. Roel P. Balayan for his valuable suggestions, inspiring guidance, assistance, and deep concern in the preparation of this research. Second, to BSE Math major graduates of Cavite State University Tanza campus for their cooperation and by sharing their time to be the respondents of this study. Third, to the experts named after Prof. Mildred A. Sebastian, Dr. Louziela P. Masana, Mr. Raul C. Florida, Mr. Andrew J. Siducon and Ms. Jill Irish Trinidad for extending and sharing time and expertise to validate the self-made questionnaire. Fourth, to the thirty-one (31) graduates of BSE Math major who willingly responded the pilot testing of the questionnaire. Next, to my friends and colleagues at Cavite State University Tanza campus headed by Prof. Gil D. Ramos, most especially to my TED family for the understanding and moral support throughout the study. Last, to my beloved family, Papa, Mama, Cer, JB, Ed, Anong, Lay, Ang, Polo, Arah, Lucky and Francine, to whom I am forever indebted, and for the love, care and moral support given to me and believing on my ability. And above all, to our Almighty God who enlightened my soul and mind, who always guided and showered me the best courage, knowledge and wisdom, determination and strength for the realization and success of this research work, who made everything possible.

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Math Anxiety and Development of an Instructional Material to Improve Performance in Mathematics

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Abstract - Mathematics education in the Philippines has consistently struggled with poor performance. One of the main reasons that hinder students' performance in the subject is math anxiety, which interferes with cognitive and learning processes. This research determined the level of math anxiety among students and developed an instructional material to improve their performance in mathematics. The study used mixed method, educational design research (EDR) and experimental research design. Data on the levels of math anxiety were gathered from 307 Mathematics students which was substantiated by focus group discussions with 50 students and 4 mathematics specialists. From this data, an instructional material was developed and pilot implemented in a mathematics class of forty-two (42) students. Findings revealed that 80.13% of the student-respondents had Average to High Math Anxiety. The causes of math anxiety were mainly negative experiences such as past failures, pressure to find the correct answers, embarrassment in front of peers and strict teachers. Instructional materials that reduce math anxiety are ones that are easy to understand, contain varied activities, and incorporate additional online resources. Results of paired samples t-test revealed that the instructional material significantly lowered math anxiety and improved the students' performance in mathematics. It is thus recommended that universities expand guidance and counseling services to recognize math anxiety as an integral factor of students' mental health and conduct a review of the mathematics instructional materials to evaluate their adequacy in lowering the math anxiety of students.

Keywords - Math Anxiety; Instructional Material; Mathematics Performance

Introduction

One of the problems that plague Philippine education is the poor performance of students in mathematics. According to a UNESCO (2012) study on basic mathematics education, across both national and international levels, students do not have the expected knowledge and competencies in mathematics. While many countries struggle in this aspect, the Philippines has lagged way behind other countries, as revealed by the Trends in International Maths and Science Study (TIMSS) 2019 survey. With the country's consistently poor performance in the TIMSS rankings, the UNESCO report describes the condition of mathematics education in the Philippines as being in a "crisis state".

It is also not only mathematical competencies that are in question. The UNESCO study adds that even among the students from countries who rank high in the TIMSS survey (Singapore, Korea, Japan), many did not even like Mathematics nor see its usefulness. Therefore, the academe needs to put effort not only into improving mathematical competency but also into fostering a positive attitude towards mathematics itself. When students view math negatively, it impedes their performance in the subject. The correlation of math anxiety and performance is a global phenomenon: countries with lower levels of math anxiety had higher Program for International Student Assessment (PISA) math score (Foley et al., 2017. In other words, there is a link between students' attitude towards mathematics and how well they perform in math tests.

Math anxiety is described as the "feeling of tension, apprehension, or fear that interferes with math performance" (Ashcraft, 2002, p. 181), while "feelings of tension, panic and fear that one experiences in the face of tasks requiring numerical calculations or mathematical problems" (Ilhan, 2015, p. 1).

This is a phenomenon that many people experience. A study by the University of Granada (2009) estimates that about 6 out of 10 university students experience math anxiety, with women experiencing it more than men. The same study details the symptoms of math anxiety as "tension, nervousness, concern, worry, edginess, impatience, confusion, fear and mental block" when studying mathematics. Further, even people with high IQ experience math anxiety (Ashcraft, 2002). Thus, regardless of their perceived intelligence level, people feel apprehensive towards math.

Math anxiety is not a reaction people are born with, but rather a learned emotional response and it has implications for the future employment of students, but also their overall performance while in school. Math anxiety correlates with other types of anxiety, most significantly with test anxiety, suggesting that a person who is anxious about mathematics would also feel unease with taking tests in general (Ashcraft, 2002).

This study was based on the Debilitating Anxiety Model (Hembree, 1990) which states that math anxiety leads to poor performance in mathematics because of two reasons: math avoidance and cognitive interference. Meta-analysis indicated that adolescents with math anxiety tend to avoid math-related situations, causing them to have fewer learning opportunities. People with high math anxiety also tend to avoid processing mathematical problems or simply rush their answers, causing poor performance.

Additionally, the Debilitating Anxiety Model posits that math anxiety causes cognitive interference. Math anxiety activates the neural pain network and impairs the working memory functions of the brain (Ashcraft & Krause, 2007). This is also supported by functional magnetic resonance imaging (fMRI) brain scans of students while solving addition and subtraction problems, which found that math anxiety activates the part of the brain linked with fear while at the same time impairing the working memory and reasoning parts of the brain Thus, children who had high levels of math anxiety felt the same fear as if they were faced with physically threatening situations, such as seeing a dangerous animal (Young, et. al, 2012).

This is also consistent with the Processing Efficiency Theory (Eysenck & Calvo, 1992), which hypothesizes that general anxiety disrupts ongoing working memory processes because anxious individuals devote more attention to their intrusive thoughts and worries, rather than the task at hand. This is also supported by a study (Dagaylo-an & Tancinco, 2016), which found that a negative correlation exists between math anxiety and the high school mathematics grade of students.

Given the immense effect of math anxiety on performance, there is a need to address students' qualms about mathematics to improve their math performance. In the quest to improve mathematics proficiency, it is worthwhile to emphasize not only enhancing instructional strategies but also developing a positive attitude towards mathematics. Based on the above-mentioned gap, this study aimed to determine the level and causes of math anxiety among students, as well as develop an instructional material to alleviate math anxiety and improve mathematics performance.

Mathematics instructional materials have been viewed as essential resources for learning mathematical content and teachers are accustomed to using them to guide instruction (Stein & Kim, 2009). Teachers often rely heavily on textbooks for many decisions such as the content to be discussed, methods to be used, and exercises to assign to their students (Ozgeldi & Cakiroglu, 2011). It is therefore reasonable to think that instructional materials such as mathematics textbooks are integral to mathematics teaching and learning.

Instructional materials perform a crucial role in mathematics education as it enhances the academic skills of students. Several researchers found that using instructional materials can significantly increase the performance of students as compared to the traditional chalk and talk method of teaching (Dahar & Faize, 2011; Andersen, 2002; Selga, 2013; Espinar & Ballado, 2017). Similarly, the use of workbooks is beneficial, resulting in not only higher scores in standardized tests but also in the power of self-direction, retention, fundamental process skills, reasoning ability and solving problems (Gray, 2007).

The use of instructional materials not only has implications inside the classroom, but also in the general math competence of the country. One of the factors for the poor performance of Filipino students in national exams such as the National Elementary Achievement Test and National Secondary Achievement Test is the inadequate and inappropriate instructional materials used by teachers (Morella, 2004). The deficiency of instructional materials such as textbooks, manuals, and science equipment is also a factor in the poor quality of education in the country is also (Samonte, 2008). Further, students who were most successful in the TIMSS are more likely to have better instructional materials such as books, technological support and supplies (Mullis, et. al, 2016).

However, it is not only the quantity of resources that is a problem in the Philippines, but also the quality and appropriateness that is an issue. Dr. Michael Tan (2015), Chancellor of University of the Philippines Diliman, opines that many university professors prefer to use foreign textbooks rather than develop their own. This results to textbooks that are not appropriate for the local context; for example, having exercises involving gallons and liters instead of local measurements that are still used in daily life, such as gantas and cavans for rice.

Thus, increasing the availability and quality of instructional materials is essential in the quest to improve the mathematics performance of Filipino students. With the new tertiary curricula as a result of the K-to-12 Education System, it is imperative that new materials be created to address the needs of teachers and students. The instructional material developed from this research study would increase the resources available to Filipino learners.

This study aimed to develop an eLearning-based instructional material to reduce math anxiety and improve mathematics performance among students.

Methodology

The study utilized three research designs: mixed method of quantitative-qualitative research, educational design research (EDR) and experimental research through the pretest-posttest design.

Data on the level of math anxiety among students were measured using the Abbreviated Math Anxiety Rating Scale (A-MARS) created by Alexander and Martray (1989). The A-MARS uses a 5-point Likert scale from 1 (low anxiety) to 5 (high anxiety). The questionnaire has internal reliability of 0.96, test-retest reliability of 0.90 and in terms of validity, it has a 0.92 correlation with the Math Anxiety Rating Scale. The respondents of the questionnaire were 307 Mathematics students from the five campuses of a state university.

The qualitative data were substantiated by focus group discussions with students and teachers to determine the causes of math anxiety among students. The key informants for the focus group discussions were fifty (50) students who were taking various mathematics courses, ten (10) from each of the five campuses of the University and four (4) mathematics professors and instructors. Student informants were chosen through random sampling. The setup for the interview was focus group discussion (FGD), which was video- and audio-recorded to accurately document details of the conversations.

To interpret the mean level of math anxiety from the A-MARS, the researcher constructed the following arbitrary scale:

Table 1. Arbitrary scale used in interpreting the level of math anxiety

Mean Math Anxiety Score	Description	Interpretation
1.00-1.49	Not at all	Very Low Math Anxiety
1.50 – 2.49	A little	Low Math Anxiety
2.50 – 3.49	A fair amount	Average Math Anxiety
3.50 – 4.49	Much	High Math Anxiety
4.50 – 5.00	Very Much	Very High Math Anxiety

To interpret the data from focus group discussions, thematic analysis was employed. Thematic analysis is a method in qualitative research for "identifying, analyzing, and reporting patterns (themes) within data" (Braun & Clarke, 2006). This method involves searching certain themes or patterns across the whole data set. This study followed the six steps of thematic analysis: 1) familiarization with the data through transcription; 2) coding; 3) searching for themes; 4) reviewing themes; 5) defining and naming themes; and 6) producing the report.

Educational design research was employed for the development of the instructional material. Based on the qualitative and quantitative data gathered, an instructional material was developed and tested in a mathematics class of 42 students for a period of six (6) weeks.

In order to determine whether there was a significant increase in mathematics performance of students, the experimental method of pretest-posttest design was utilized in this study. The treatment administered was the utilization of the instructional material. The variables of interest were level of math anxiety which was measured through the Abbreviated Mathematics Anxiety Rating Scale (A-MARS) and the performance of students in mathematics, which was measured through a researcher-made test that covered topics included in the instructional material. The students' pretest and posttest scores were analyzed using paired samples t-test to ascertain if there was a significant difference in the math anxiety and performance of students before and after utilizing the instructional material.

In order to ascertain the validity of qualitative data, triangulation was conducted. In this research, member checking was done by conducting interviews with the participants after pilot implementation of the instructional material. External audit was also done by having the qualitative data evaluated by two (2) mathematics specialists who are not involved in the research.

Results and Discussions

Level of Math Anxiety Among Students

Results as shown in Table 2 reveal that out of 307 respondents, three (3) or 0.98% had Very Low Math Anxiety, forty-five (45) or 14.66% had Low Math Anxiety, one hundred forty-four (144) or 46.91% had Average Math Anxiety, one hundred two (102) or 33.22% had High Math Anxiety and thirteen (13) or 4.23% had Very High Math Anxiety.

Table 2. Levels of math anxiety among students

Level of Math Anxiety	Frequency	Percentage
Very Low Math Anxiety	3	0.98%
Low Math Anxiety	45	14.66%
Average Math Anxiety	144	46.91%
High Math Anxiety	102	33.22%
Very High Math Anxiety	13	4.23%
Total	307	100.00%

In addition, results of the A-MARS questionnaire as shown in Table 3 revealed that the situations when students felt High Math Anxiety were taking a final exam in a math course (3.56), thinking about an upcoming math test 1 hour before (3.64), and receiving their final math grade (3.79). This indicates a predisposition for students to put more emphasis on grades rather than the learning process itself. On the other hand, students felt Low Math Anxiety when buying a mathematics textbook (1.89), walking into a math class (2.30) and reading a cash register receipt after a purchase (2.40).

Table 3. Math Anxiety Levels of Students in Various Situations in the A-MARS

Indicator	Average Score	Interpretation
Studying for a math test.	2.89	Average Math Anxiety
Taking math section of the college entrance exam.	3.06	Average Math Anxiety

Taking an exam (quiz) in a math course.	3.31	Average Math Anxiety
Taking a final exam in a math course.	3.56	High Math Anxiety
Picking up math textbook to begin working on a homework.	2.51	Average Math Anxiety
Being given homework assignments of many difficult problems that are due the next class meeting.	3.15	Average Math Anxiety
Thinking about an upcoming math test 1 week before.	2.83	Average Math Anxiety
Thinking about an upcoming math test 1 day before.	3.26	Average Math Anxiety
Thinking about an upcoming math test 1 hour before.	3.64	High Math Anxiety
Realizing you have to take a certain number of math classes to fulfill requirements.	3.30	Average Math Anxiety
Picking up math textbook to begin a difficult reading assignment.	2.89	Average Math Anxiety
Receiving your final math grade.	3.79	High Math Anxiety
Opening a math or stat book and seeing a page full of problems.	3.13	Average Math Anxiety
Getting ready to study for a math test.	2.98	Average Math Anxiety
Being given a “pop” quiz in a math class.	3.25	Average Math Anxiety
Reading a cash register receipt after your purchase.	2.40	Low Math Anxiety
Being given a set of numerical problems involving addition to solve on paper.	2.67	Average Math Anxiety
Being given a set of subtraction problems to solve.	2.51	Average Math Anxiety
Being given a set of multiplication problems to solve.	2.61	Average Math Anxiety
Being given a set of division problems to solve.	2.71	Average Math Anxiety
Buying a math textbook.	1.89	Low Math Anxiety
Watching a teacher work on an algebraic equation on the board.	2.93	Average Math Anxiety
Signing up for a math course.	2.84	Average Math Anxiety
Listening to another student explain a math formula.	2.83	Average Math Anxiety
Walking into a math class.	2.30	Low Math Anxiety
Mean	2.93	Average Math Anxiety

Students also reported that their mind goes blank especially when trying to solve problems or remembering formulas. For instance, Denise relates, "Ga-blanko ako sa exam kapag gina-nerbyos." (My mind goes blank in the exam when I'm nervous.) This supports the processing efficiency theory (Eysenck & Calvo, 1992), which states that math anxiety disrupts the ongoing working memory processes and is in concurrence with the Debilitating Anxiety Model (Hembree, 1990) which argues that math anxiety interferes with the pre-processing, processing and retrieval of information.

Causes of Math Anxiety

Findings from the focus group discussion with students revealed four main themes that underlie their fear towards math: past failures, pressure to find the right answers, fear of being embarrassed in front of peers and negative experiences with teachers. Table 4 gives an overview of these findings.

Table 4. Causes of Math Anxiety from the Perspective of Students

Codes	Theme
"getting a grade of 3.0 … traumatized me" "got a 79 in math … I get frustrated" "failed in first year algebra" "got a grade of 2.25 … lowered my self-esteem" "you get a zero … you'll be really nervous" "I got a zero. I was scared"	Past Failures

"even if you just miss one, all your answers will be incorrect" "once you don't understand the formula, you can't solve it" "if I don't know the formula, I feel discouraged"	Pressure to Find Right Answers
"you don't even know the answer and you get embarrassed" "once I'm asked to answer on the board, my mind goes blank" "you'll be laughed at" "nervous because they can, but I can't" "once the majority says … I follow suit"	Embarrassment in Front of Peers
"my teacher was a perfectionist" "he would chastise us for an hour" "our teacher said, 'I'll fail you if you don't pass the final exam'" "some teachers who are insulting" "the teacher banged the student's head to the blackboard three times" "my mother trained us in math as if we were in the military" "they discuss too fast" "we couldn't catch up because the formulas were inconsistent"	Negative Experiences with Teachers

Past failures. Many students felt anxious towards mathematics after getting low grades even though they put much effort into studying.

Richard said, "When I received a grade of 3.00 in Contemporary Mathematics. I did my best naman talaga, siguro 'yung teacher lang talaga 'yung ano. Na-trauma lang talaga ako doon." (I did my best, but I guess it depends on the teacher. It traumatized me.)

Janice also related that even though she did well in math before, she was discouraged because of a failure. "Kat elementary hay nakaka-top 10 pa ako sa subject nga math. Pero kat nag-high school ako, umpisa ko first year algebra hay medyo wa ta eagi, medyo nabagsak eot-a ako hasta fourth year ag college. (When I was in elementary, I was in the top 10 in math. But when I came to high school, I already failed in first year algebra. It continued until fourth year and college.)

Feelings of failure are exacerbated when a student gets a zero, whether on a quiz or an exam. Nancy shared, "Di ba basic lang, pero imo tang score hay zero. Sa sunod dayon hay nakuebaan ka eon gid. Basic pa nga lang, zero ka eon. Paano pa kaya ro next?" (When it's just basic and you get a zero, next time, you'll be really nervous. If you got a zero on the basics, how much more in the next ones?)

This result is in consonance with Psychological/Emotional aspect of Strawderman's (2011) Math Anxiety Model stating that experiencing failure in math exacerbates anxiety and leads to avoidance, thus resulting to more failures. This also ties with Bandura's (1977) concept of self-efficacy. Receiving a low score, especially a zero, negates a student's efforts and makes them doubt their ability to further solve math problems.

Pressure to find right answers. Students also felt anxious towards math because unlike other subjects, there is a need to arrive at a specific answer. Deviating even a little or making a small mistake invalidated their whole answer.

Katherine related her experience, "Nakakatakot kasi may time talaga na mali yung formula mo, kahit isa lang kulang, mali lahat ng sagot mo. Kapag mali lahat yung sagot, siyempre babagsak ka talaga no'n kaya magkakaroon ka ng anxiety." (It's scary because there are times when you have the wrong formula, even if you just miss one, all your answers will be incorrect. When all your answers are wrong, of course, you'll fail, so you get anxiety.) Dianne also comfirmed, "Sambilog mo abi nga mali, mali eon dayon tanan ing answer." (If you make just one mistake, your whole answer will be incorrect.)

Added to this, students felt that they have to memorize a lot of formulas in order to get the right answer. Lorraine said, "Para kakon hay nakaka-bobo nga nakakalito. Once abi nga indi mo maintindihan ro formula hay indi ka eon dayon ka-solve." (It makes me feel stupid and confused. Once you don't understand the formula, you can't solve it anymore.) These connect to the Intellectual/Educational aspect of the Math Anxiety Model by Strawderman (2011) stating that cognitive influences such a person's knowledge and skills affect their attitude towards mathematics.

Embarrassment in front of peers. The fear of making mistakes and getting embarrassed in front of their classmates make students more anxious toward math. This especially happens when they have to solve a problem or recite in class.

Stacy said she feels most nervous "Kung ginatukso ikaw. Wa ka ngani it sabat tapos pinahiya ka pa." (When you're asked to recite. You don't even know the answer and you get embarrassed.) For her, being asked to answer in front of others was a particularly high-stress situation. "While ga-discuss si Ma'am, ginasundan ko man ro formula; pero once tinukso ka eon sa blackboard, parang wa eon, blangko." (While our teacher discusses, I can follow the formula; but once I'm asked to answer on the board, my mind goes blank.)

Students, especially in their teenage years, are very sensitive to the opinion of their peers. Natalie related, "Ginatukso pa ngani sanda kung amat sa prente kaya ginakuebaan. Nahuhuya sanda sa andang classmate kasi di nanda kaya." (They are asked to recite in front so they get nervous. They get embarrassed in front of their classmates because they can't do it.)

On the other hand, negative attitude of peers towards math also affects a student. Lorraine said, "Nadadala ako sa ibang tawo. Syempre iba abi sa aton hay hate gid a ro math, malisod nga subject. Once abi nga majority kanda hay, 'Malisod ro math; di mo kaya i-solve don.' napapasunod ka man." (I get swayed by other people. Of course, many people hate math; it's a difficult subject. Once the majority says 'Math is difficult; you can't solve that', I follow suit.)

This ties to the Social/Motivational Aspect of the Math Anxiety Model (Strawderman, 2011) which states that negative attitudes towards math of peers strongly influence a person's outlook towards mathematics. A high-pressure environment thus leads to math-avoidant behavior.

Negative experiences with teachers. Several students relayed that they started to fear math after encountering strict teachers, especially ones who punished them for poor performance. Some students reported receiving verbal insults from teachers. Richard shared, "Yung practice ng teacher namin noong high school because it affected among pag-study sa college. Ro pirming mueay, one hour, bilog nga klase. Tapos pilang adlaw hay quiz dayon, wa ka mat nasayran. Magturo man hay kadasig-dasig." (Maybe the practice of our high school teacher, it really affected us in college. He would chastise us for an hour, the whole class. Then after a few days, he gives a quiz when we haven't learned anything. He teaches too fast.)

Rachel also shared that they were threatened with failing marks.

"Na-traumatize kasi ako nung time na sinabing, 'Babagsakin ko kayo kapag di nakapasa ng final exam. Sa midterm mababa kayong lahat. Pero pagbibigyan ko kayo sa final. Once na bagsak pa rin kayo, bahala na kayo. Kita-kita nalang tayo next year. Baka wala na 'tong subject na tayo by next year. Bahala kayo.'" (I got traumatized when our teacher said, "I'll fail you if you don't pass the final exam. You all got low scores in the midterms, but I'll give you a chance in the finals. If you still fail, it's your problem. Let's see each other next year. Maybe this course won't be available anymore. It's your problem.")

Physical punishments did not only come from teachers, but also from parents. Ralph said, "Kat elementary ako gina-pressure ako ni Mama ag Ate nga mataas ang grade. So kung di kaantigo mag-solve sa baeay, may katabi abi ako nga pamalo, so ginapilit ko ang sarili nga magsabat it tama." (When I was in elementary, my mother and elder sister pressured me to get good grades. At home, when I didn't know how to solve, there was a paddle beside me, so I forced myself to answer correctly.)

Patrick shared his experience with his mother: "Si Mama kasi dati as in parang military gid a anang pag-training kakon sa math. Lahat ng hanger sa bahay nababali." (My mother trained us in math as if we were in the military. All hangers in our house got broken.)

These results match with the study of Caga (2015) which found that math anxiety significantly correlates with teacher factors such as formative and summative assessment practices and personality as to openness, extraversion, agreeableness and neuroticism.

Acceptability of the Developed Instructional Material

Results presented in Table 5 show the acceptability of the instructional material in terms of physical aspects, mathematics content and processes, instructional design, learning activities, and evaluation procedure. Overall, the instructional material had a rating of 3.72, which is Very Acceptable and thus, it had excellently met the standards.

Table 5. Acceptability of Developed Instructional Material

Criteria	Average Score	Description
1. Physical Aspects	**3.83**	**Very Acceptable**
a. The learning module provides a useful table of contents, glossary, supplemental pages, and index.	3.90	Very Acceptable
b. Layout is consistent; chapters/units are arranged logically.	3.80	Very Acceptable
c. Size and format of print is appropriate.	3.70	Very Acceptable
d. Format is visually appealing and interesting.	3.90	Very Acceptable
2. Mathematics Content and Processes	**3.68**	**Very Acceptable**
a. The content of the learning module reflects the problem-solving nature of mathematics and the thinking that mathematicians use.	3.80	Very Acceptable
b. It makes connections within mathematics and between disciplines.	3.60	Very Acceptable
c. Mathematics as communication and representation are built within the learning module.	3.70	Very Acceptable
d. Mathematics as reasoning and proof is built into the learning module.	3.60	Very Acceptable
3. Instructional Design	**3.75**	**Very Acceptable**
a. The learning goals are clear and explicitly stated and the students are asked to work on worthwhile mathematical tasks.	4.00	Very Acceptable
b. The learning module is coherent: its instructional design attends to students' prior knowledge.	3.90	Very Acceptable
c. The learning module provides extensive use of open-ended, free response, questions.	3.80	Very Acceptable
d. The instructional materials incorporate calculators, computers and/or other technology into the learning module as tools for student to use to do mathematics.	3.50	Very Acceptable
e. The learning module provides differentiated instructional strategies to address diverse learning needs	3.70	Very Acceptable
f. Pedagogical content knowledge (PCK) is soundly infused in the learning module.	3.60	Very Acceptable
4. Learning Activities	**3.70**	**Very Acceptable**
a. The learning module is designed so that students are active learners.	3.80	Very Acceptable
b. The learning module is designed for students to construct their own understanding of mathematics.	3.70	Very Acceptable
c. The learning module asks students to engage in mathematical discourse.	3.50	Very Acceptable
d. Manipulatives and/or technology are provided to explore mathematical ideas, model mathematical situations, analyze data, calculate numerical results and solve problems.	3.70	Very Acceptable
e. Students are expected to reflect on, make judgments about, and report on their own thought process, problem solving attempts, and performance.	3.70	Very Acceptable
f. The learning module provides suggestions to teachers so that in tasks and lessons teachers can help students to: • work together to make sense of mathematics	3.80	Very Acceptable

• rely more on themselves to determine whether something is mathematically correct • reason mathematically • learn to conjecture, invent, and solve problems • connect mathematics, its ideas, and its applications to other topics within mathematics and to other disciplines.		
5. Evaluation Procedure	**3.65**	**Very Acceptable**
a. Student assessment integrates content and process standards into the instructional program.	3.70	Very Acceptable
b. Multiple means of assessment are used, informal as well as formal.	3.60	Very Acceptable
c. Assessment tasks include connections between mathematical ideas.	3.70	Very Acceptable
d. Conceptual understanding and procedural knowledge are frequently assessed through tasks that ask students to apply information about a given concept in a novel situation.	3.60	Very Acceptable
Overall	**3.72**	**Very Acceptable**

Level of Math Anxiety before and after Utilization of Instructional Material

Table 6 shows the level of math anxiety of students before and after using the developed instructional material. Before utilizing the instructional material, five (5) participants had High Math Anxiety, twenty (20) participants had Average Math Anxiety, and seven (7) shad Low Math Anxiety. After utilizing the instructional material, three (3) participants had High Math Anxiety, fourteen (14) had Average Math Anxiety, ten (10) had Low Math Anxiety and five (5) had Very Low Math Anxiety.

Table 6. Level of Math Anxiety Before and After Utilizing the Instructional Material

Level of Math Anxiety	**Number of Students**		**Difference**
	Before	After	
Very High	0	0	0
High	5	3	(2)
Average Math Anxiety	20	14	(6)
Low	7	10	3
Very Low	0	5	5
Total	**32**	**32**	

Analysis of paired samples t-test conducted using SPSS resulted to a t-value of 4.179 and a p-value of 0.000, warranting the rejection of the null hypothesis. This showed that there was a significant decrease in the math anxiety of students after utilizing the developed instructional material.

Level of Math Performance before and after Utilization of Instructional Material

Table 7 shows the performance of students in the pretest and posttest scores. Before utilizing the instructional material, one (1) participant scored Very High, three (3) participants scored High, sixteen (16) scored Average, nine (9) scored Low, and three (3) scored Very Low. After utilizing the instructional material, six (6) participants scored Very High, seventeen (17) scored High, eight (8) scored Average, one (1) scored Low and none scored Very Low.

Table 7. Performance of Students Before and After Utilizing the Instructional Material

Score		**Number of Students**		**Difference**
		Pretest	Posttest	
Very High	(25 - 30)	1	6	5
High	(19 - 24)	3	17	14
Average (13 - 18)		16	8	(8)
Low	(7 – 12)	9	1	(8)
Very Low	(0)	3	0	(3)
Total		**32**	**32**	

Analysis of paired samples t-test conducted using SPSS resulted to a t-value of -12.513 and a p-value of 0.000, warranting the rejection of the null hypothesis. This showed that there was a significant increase in mathematics performance of students after utilizing the developed instructional material.

Conclusion and Recommendations

This study aimed to determine the level and causes of math anxiety among the students of a state university as a springboard for initiating steps to address their apprehension about the subject and improve performance in mathematics through the development of an instructional material.

Findings revealed that 80.13% of the student-respondents have Average to High Math Anxiety and students felt the most anxiety in high stakes situations such as final exams, tests and receiving final grades. The themes that emerged as causes of math anxiety were identified to be mainly: past failures, pressure to find the right answers, fear of being embarrassed in front of peers and negative experiences with teachers. Instructional materials that reduce math anxiety are ones which are easy to understand, contain varied activities, and incorporate additional online resources.

As teacher factor was reported to play a huge part in the cause of math anxiety, teachers must ensure that their strategies and demeanor towards students will encourage them to study math and lessen their anxiety. To recognize effort and motivate students to improve, teachers may use grading systems that gauge the student's understanding of the process and instead of solely basing points on whether they got the correct answer. Teachers must also be more considerate of students' mental wellbeing during highly sensitive times such as exam period. In addition, teachers may create their own instructional materials to ensure that these match the needs and level of their students.

School administrators may conduct a review of the mathematics instructional materials used by the institution to evaluate their adequacy in lowering the math anxiety of students. Textbook writers for mathematics must ensure that the instructional materials they create are easy to understand, contain diverse activities and feature online resources for the benefit of students.

The university's guidance and counseling services should be expanded to recognize math anxiety as an integral factor of students' mental health and offer support systems for students struggling with the subject. Organizing peer tutorial sessions will have the added benefit of fostering a venue where students can seek help from their peers without fear of being embarrassed. Counseling programs may also be conducted to encourage students not to stress on grades but rather on the learning process itself.

In the home front, parents should encourage their children to learn instead of worrying about grades. They must also avoid punishing children for poor performance as this increases math anxiety.

As the researcher works with college students, this study determined the level of math anxiety of students only when they are at the tertiary level and had already developed math anxiety. Future researchers may conduct longitudinal studies to examine how students develop math anxiety from preschool, primary and secondary levels in order to initiate steps for early intervention.

Acknowledgement

The researcher expresses her gratitude to the following people: Dr. Emily Arangote, President of Aklan State University, for the unwavering support to faculty's professional development and research activities; to Dr. Celedonia Hilario, Dr. Amelia Navejas, Dr. Eleanor Rosales, Dr. Manuel Malonisio, and Dr. Perlita Israel, for serving as mentors, especially in mathematics research; to the ASU Research and Development Services unit, for the assistance to faculty in conducting their research; and most importantly, to the researcher's family, for being a source of strength and comfort at all times.

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BUSINESS AND FINANCE

Innovation Capability and Financial Performance of Philippine Coffee Manufacturing MSMEs

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Abstract - While there is consensus among scholars on the importance of innovation capability on the firm's performance, there is still uncertainty on their influence on the performance of Philippine coffee manufacturing Micro, Small and Medium Enterprises (MSMEs). Specifically, this paper aimed to (1) assess the level of innovation capability of the participants in terms of product innovation capability, organizational innovation capability, process innovation capability, marketing innovation capability, innovation culture, and innovation resource (2) assess the performance of the firms, and (3) determine if the innovation capability of firms influence performance. Using a quantitative survey administered personally and online to 106 managers of coffee manufacturing firms in the Philippines, this paper made use of descriptive statistics, bootstrap method and regression analysis to answer the objectives. A cross-sectional analysis was done to determine the influence of innovation capability to performance. Findings of the study revealed that product innovation capability, process innovation capability, marketing innovation capability, and innovation culture were interpreted to be very high capabilities that the firms possessed while organizational innovation capability and innovation resource were found to be high capabilities. Perceived performance of firms indicated that coffee manufacturing firms were performing better than the target or standards. All parameters influenced return on assets (ROA) and market share at 5% level of significance while all except product innovation capability influenced profit margin. Meanwhile, organizational innovation capability, marketing innovation capability, innovation culture and innovation resource influenced sales growth.

Keywords - Performance; Innovation capability; Coffee manufacturing; Bootstrap; MSMEs

Introduction

Philippine coffee manufacturing firms that are mostly upstarts and micro, small, and medium enterprises (MSMEs) do not have the economies of scale and resources to compete with industry leaders and foreign competition. The Philippine government, recognizing the potential of the coffee industry, extended support with the creation of the Philippine Coffee Industry Roadmap 2017-2022 to encourage growth in the sector. While the domestic supply is being augmented by coffee imports, there is a need to improve performance of local manufacturers that are predominantly MSMEs whose domestic market is also plagued by foreign competition (Department of Agriculture (DA) and the Department of Trade and Industry (DTI), 2017).

The firms' performance can be viewed as a measure of financial ability which can be measured quantitatively or qualitatively (Ibrahim Naala, et.al., 2017). While performance can be measured using an objective concept based on absolute measures of performance and by a subjective concept based on self-reported measures, many researchers prefer to use subjective measures because it is cost effective and widely used to measure business performances of small enterprises, public services, and voluntary sector organizations (Noordin & Mohtar, 2013). This paper subscribes to the performance measures suggested by Pervan, et. al. (2018) specifically return on assets (ROA), profit margin, sales growth, and market share (Pervan, et. al., 2018)

While there is consensus among scholars on the importance of innovation capability on the firm's performance (Saunila & Ukko, 2012; Noordin & Mohtar, 2013; Ibrahim Naala, et. al., 2017), there is a knowledge gap on their influence on the performance of Philippine coffee manufacturing micro, small and medium enterprises.

Innovation capability refers to the firm's capacity to put on its collective knowledge, skills and resources to innovation activities for the creation of value added for the firm and stakeholders (Hogan et. al., 2011). A literature-based model and measurement scale for innovation capability were developed by Calik, et.al. in 2017 consisting of the potential part that includes innovation resources and culture and a process part that includes the product, process, organizational and marketing innovation (Calik, et. al., 2017).

This paper discussed the perceived level of innovation capability of coffee manufacturing MSMEs, their perceived level of financial performance and determined the influence of the perceived level of innovation capability to firms' performance.

Methodology

This paper employed a quantitative research design with a hybrid method of personal surveys and web surveys. Resource-based theory and dynamic capabilities theory guided the study. The study was conducted to MSMEs as listed in the database of the Department of Trade and Industry. A survey questionnaire adapted from the works of Calik, et.al. (2017) to measure the level of innovation capability using a 4-point likert scale and to measure performance were modified from the questionnaire developed by Pervan, et.al. (2017). A total of 106 participants responded from the targeted population of 124 coffee manufacturing firms and were asked to evaluate their performance prior to the nationwide lockdown. The statistical tools used in the study were descriptive statistics (means, standard deviations) and inferential statistics particularly, regression analysis. For innovation capability level, likert scale of 4 points was used with scale 1 for totally disagree to 4 for totally agree. Subsequently, minimum score interpretation is low (min 1.00 to 1.75), medium (min 1.76 to 2.50), high (min 2.51 to 3.25) and very high (min 3.26 to 4). For the performance of firms, the scale was ranging from "1-much worse than target" to "4-much better than target". The research was conducted in the Philippines from February 2020 to April 2021. Data were collected using a questionnaire by delivering it directly to participants and one created on Google Docs by online tools such as email and social networks (Facebook, FB messenger, and Facebook groups). The study made use of the bootstrap method. According to Hesterberg (2015), the bootstrap is used to estimate standard errors and bias, getting confidence intervals and use for tests (Hesterberg, 2015). Nikitina, et.al. (2019) described the method as a robust statistical method whose strength lies in generating data by resampling and replacing actual data without the need to rely on arbitrary processes of creating imaginary data. The controversy on whether means, standard deviations, and parametric statistics can be used for ordinal data like those that come from Likert scales was comprehensively reviewed by Dr. Geoff Norman, one of the experts in medical education research methodology. He provided compelling evidence that parametric tests can be used with ordinal data, such as data from Likert scales, and is generally more robust than nonparametric tests (Sullivan & Artino, Jr., 2013). Regression analysis and cross-sectional analysis was done to determine the influence of innovation capability to performance.

Results and Discussions

Innovation capability has six (6) subcomponents, namely: product innovation capability, organizational innovation capability, process innovation capability, marketing innovation capability, innovation culture, and innovation resource. Product innovation capability means enhancing, acquiring, and creating new products and services as critical tools to reach success. Organizational innovation capability is the capacity to be above par competitors in development of new managerial work, processes, and systems; success in commercializing and industrializing new products; and reducing the time in developing new products and services. Process innovation capability describes the flexibility to provide products and services according to the demands of the customers; development of in-house solutions to improve manufacturing processes; and actively works to constantly adjust its business processes. Marketing innovation capability refers to the implementation of new marketing methods to promote products; constantly looking for new ways to deliver products to customers; and customer satisfaction through improved customer relationships. Innovation culture is a work environment that the coffee firms create to encourage collaboration and exchange of ideas between the departments to come up with new approaches; transform information from internal and external sources into valuable knowledge; and inject new ideas and methods to provide innovative solutions to clients' problems. Innovation resource refers to the strong capacity in innovative design and manufacturing applications; priority in training R & D personnel; and constant increase in budget allocation of R & D personnel. Table 1 shows the innovation capability of the coffee manufacturing firms with the mean representing the average opinion of the 106 firms on their innovation capability. Findings of the study revealed that the level of innovation capability of the coffee manufacturing firms according to the perception of the participants on the average ranged from high to very high. Product innovation capability, process innovation capability, marketing innovation capability, and innovation culture were interpreted to be very high capabilities that the firms possessed while organizational innovation capability and innovation resource were found to be high capabilities.

Table 1. Innovation capability of the coffee manufacturing firms.

Innovation capability (N = 106)	Mean	Std. Dev.	Interpretation
Product innovation capability	3.36	0.62	Very high
Organizational innovation capability	2.91	0.64	High
Process innovation capability	3.45	0.66	Very high
Marketing innovation capability	3.58	0.62	Very high
Innovation culture	3.41	0.63	Very high
Innovation resource	2.99	0.70	High

The performance of the coffee manufacturing MSMEs, on the average, in terms of return on assets (ROA), profit margin, sales growth, and market share were perceived by the participants to be better than their set target. Table 2 shows the perceived performance of coffee manufacturing firms. All of the opinions for the four (4) performance measures range from a minimum of 1 (= much worse than target) to a maximum of 4 (= much better than target). The dispersion (0.63, 0.61, 0.70, and 0.72) from the mean showed low variation between the observations and average indicating that the average is a good representative of the observation and very reliable.

Table 2. The perceived performance of coffee manufacturing firms.

Performance measure (N = 106)	Mean	Std. Dev.	Performance
Return on assets (ROA)	2.88	0.63	Better than target
Profit margin	2.92	0.61	Better than target
Sales growth	2.91	0.70	Better than target
Market share	2.68	0.72	Better than target

Table 3 shows the influence of innovation capability of coffee manufacturing firms to their return on assets (ROA) performance. The B coefficients are in natural logarithm and were converted to its anti-log (equivalent) for interpretation. All parameters ($Bi \neq 0$) influenced return on assets (ROA) at 5% level of significance.The four (4) innovation capability predictors that positively influenced return on assets (ROA) were innovation resource (= 0.329, antilog = 4.01, very high), innovation culture (= 0.181, antilog = 3.31, very high), organizational innovation capability (= 0.110, antilog = 3.05, high), and product innovation capability (= 0.057, antilog = 2.88, high). The effects of the very high innovation capability on innovation resource and innovation culture to return on assets (ROA) performance indicates that coffee manufacturing firms were performing much better than the target or standards. The high scores of organizational innovation capability and product innovation capability indicated an increase in return on assets (ROA). Also, the very high scores of innovation resources and innovation culture influenced higher return on assets (ROA). However, the negative value of the B-coefficients (= - 0.196, antilog = 2.28, medium) on marketing innovation capability influenced the return on assets (ROA) to a lower performance (worse than target or standard). Also, the negative value of process innovation capability (B = -0.126, antilog = 2.41, medium) suggests a worse than standard performance on return on assets (ROA) of the coffee manufacturing firms.

Therefore, low marketing innovation capability and process innovation capability influenced the coffee manufacturing firms to exhibit low performance on return on assets (ROA).

Table 3. Influence of innovation capability on Return on assets.

Innovation capability	B	Beta coefficients	P-value	Interpretation	Remarks
Constant	0.666		0.001	Significant	Reject Ho
Product innovation capability	0.057	0.042	0.003	Significant	
Organizational innovation capability	0.110	0.095	0.001	Significant	
Process innovation capability	-0.126	-0.094	0.001	Significant	
Marketing innovation capability	-0.196	-0.141	0.001	Significant	
Innovation culture	0.181	0.129	0.001	Significant	
Innovation resource	0.329	0.299	0.001	Significant	

Table 4 shows the influence of innovation capability to profit margin. Five (5) out of six (6) parameters (Bi ≠ 0) influenced profit margin at 5% level of significance. Innovation resource B = 0.359, antilog = 4.19, very high, ρ = 0.001) very high innovation capability influenced profit margin to much better than target or standards performance. Also, very high organizational innovation capability (B = 0.171, antilog = 3.28, ρ = 0.001) influenced the profit margin of coffee manufacturing firms to much better than standard performance. High marketing innovation capability (B = 0.050, antilog = 2.86, ρ = 0.013) influenced the profit margin of coffee manufacturing firms to better than target performance. Although statistically insignificant, high product innovation capability (B = 0.042, antilog = 2.84, ρ = 0.058) suggests better than target profit margin performance. Therefore, the very high innovation capability of the coffee manufacturing firms in innovation resource and organizational innovation capability influenced extremely the increase in profit margin. High marketing innovation capability influenced an increase in profit margin of the coffee manufacturing firms. Medium process innovation capability (B = -0.133, antilog = 2.40, medium) influenced the coffee manufacturing firms to worse than target profit margin performance. Medium innovation culture capability (B = -0.191, antilog = 2.28, medium) influenced a worse than target performance on profit margin of the coffee manufacturing firms. Medium innovation capabilities of the coffee manufacturing firm in process innovation capability and innovation culture capability have a low performance effect on profit margin.

Table 4. Influence of innovation capability to profit margin.

Innovation capability	B	Beta coefficients	P-value	Interpretation	Remarks
Constant	0.761		0.001	Significant	Reject Ho
Product innovation capability	0.042	0.033	0.058	Not Significant	
Organizational innovation capability	0.171	0.157	0.001	Significant	
Process innovation capability	-0.133	-0.106	0.001	Significant	
Marketing innovation capability	0.050	0.039	0.013	Significant	
Innovation culture	-0.191	-0.145	0.001	Significant	
Innovation resource	0.359	0.348	0.001	Significant	

Table 5 shows the influence of innovation capability to sales growth. Four (4) factors of innovation capability affected sales growth, namely: marketing innovation capability (B = 0.163, antilog = 3.24, high), organizational innovation capability (B = 0.155, antilog = 3.21, high), innovation resource (B = 0.128, antilog = 3.12, high), and innovation culture (B = -0.180, antilog = 2.31, medium). High innovation capabilities in marketing, organizational innovation, and innovation resources influenced the increase in sales growth of coffee manufacturing MSMEs. On the contrary, low capability in innovation culture influenced the decrease in sales growth of the coffee manufacturing firms.

Table 5. Influence of innovation capability to sales growth.

Innovation capability	B	Beta coefficients	P-value	Interpretation	Remarks
Constant	0.636		0.001	Significant	Reject Ho
Product innovation capability	0.029	0.021	0.218	Not Significant	
Organizational innovation capability	0.155	0.135	0.001	Significant	
Process innovation capability	0.064	0.048	0.073	Not Significant	
Marketing innovation capability	0.163	0.119	0.001	Significant	
Innovation culture	-0.180	-0.129	0.001	Significant	
Innovation resource	0.128	0.118	0.001	Significant	

Table 6 shows the effects of innovation capability to market share. All parameters (Bi ≠ 0) influenced market share at 5% level of significance. Four (4) innovation capability indicators demonstrate very high influence on market share, namely: innovation resource (= 4.23), organizational innovation capability (= 4.12), innovation culture (= 4.04), and marketing innovation capability (= 3.38).The positive values of B-coefficients indicated that very high innovation capabilities in innovation resource, organizational innovation capability, innovation culture, and marketing innovation capability influenced much better the market share of coffee manufacturing firms. However, the respondents disagree (= medium in the scale, worse than target performance) that process innovation capability and product innovation capability influenced an improved market share.

Table 6. Influence of innovation capability to market share.

Innovation capability	B	Beta coefficients	P-value	Interpretatio n	Remarks
Constant	0.411		0.001	Significant	Reject Ho
Product innovation capability	-0.414	-0.256	0.001	Significant	
Organizational innovation capability	0.348	0.256	0.001	Significant	
Process innovation capability	-0.309	-0.197	0.001	Significant	
Marketing innovation capability	0.197	0.122	0.001	Significant	
Innovation culture	0.334	0.203	0.001	Significant	
Innovation resource	0.366	0.284	0.001	Significant	

All parameters (Bi ≠ 0) influenced return on assets (ROA) at 5% level of significance. The bias corrected accelerated (Bca) bootstrap with 5,000 times resampling showed that all B-parameters were between the lower and upper limits of the 95% confidence interval, as follows: product innovation capability (0.013 ≤ 0.057 ≤ 0.104), organizational innovation capability (0.070 ≤ 0.110 ≤ 0.146), process innovation capability (-0.194 ≤ -0.126 ≤ -0.059), marketing innovation capability (-0.222 ≤ -0.196 ≤ -0.169), innovation culture (0.105 ≤ 0.181 ≤ 0.264), and innovation resource (0.295 ≤ 0.329 ≤ 0.352). Five (5) out of six (6) parameters (Bi ≠ 0) influenced profit margin at 5% level of significance. The bias corrected accelerated (Bca) bootstrap with 5,000 times resampling showed that the statistically significant five (5) parameters were between the lower and upper limits of the 95% confidence interval, as follows: organizational innovation capability (0.124 ≤ 0.171 ≤ 0.223), process innovation capability (-0.209 ≤ -0.133 ≤ -0.066), marketing innovation capability (0.010 ≤ 0.050 ≤ 0.092), innovation culture (-0.253 ≤ -0.191 ≤ -0.133), and innovation resource (0.318 ≤ 0.359 ≤ 0.401). Four (4) out of six (6) parameters (Bi ≠ 0) influenced sales growth at 5% level of significance. The bias corrected accelerated (Bca) bootstrap with 5,000 times resampling showed that the statistically significant four (4) parameters were between the lower and upper limits of the 95% confidence interval, as follows: marketing innovation capability (0.111 ≤ 0.163 ≤ 0.213), organizational innovation capability (0.081 ≤ 0.155 ≤ 0.228), innovation resource (0.084 ≤ 0.128 ≤ 0.169), and innovation culture (-0.241 ≤ -0.180 ≤ -0.121). All parameters (Bi ≠ 0) influenced market share at 5% level of significance. The bias corrected accelerated (Bca) bootstrap with 5,000 times resampling showed that all B-parameters were between the lower and upper limits of the 95% confidence interval, as follows: product innovation capability (-0.461 ≤ -0.414 ≤ -0.367), organizational innovation capability (0.289 ≤ 0.348

≤ 0.403), process innovation capability (-0.393 ≤ -0.309≤ -0.232), marketing innovation capability (0.161 ≤ 0.197 ≤ 0.235), innovation culture (0.224 ≤ 0.334 ≤ 0.427), and innovation resource (0.309 ≤ 0.366 ≤ 0.435).

Conclusion and Recommendations

The perceived innovation capability of the MSMEs engaged in coffee manufacturing were found to be very high capabilities in terms of product innovation capability, process innovation capability, marketing innovation capability, and innovation culture while organizational innovation capability and innovation resource were perceived to be high capabilities. The performance of these firms, on the average, in terms of return on assets (ROA), profit margin, sales growth, and market share were perceived by the participants to be better than their set target. Perceived innovation capabilities by the firms, in general, were found to influence the firms' performance with all subcomponents affecting return on assets (ROA) and market share, five (5) subcomponents influencing profit margin and four (4) subcomponents affecting sales growth. The paper is limited to pre pandemic evaluation of the performance of the MSMEs engaged in manufacturing from the perception of the participants. The findings however can serve as a guide in crafting programs and policies aimed at improving and strengthening innovation capabilities to further improve the performance of the MSMEs engaged in coffee manufacturing. The results can be a reflection of, but not the situation in other countries, owing to similarities and differences in culture, resource endowments and other factors. Hence further studies can be conducted in other areas as well.

Acknowledgement

The study was funded by the Commission on Higher Education (CHED) Scholarships for Graduate Studies – Local (SGS-L) K to 12 Philippines Scholarship Program. Sincerest gratitude also is extended to The Graduate School, University of Santo Tomas and the Cavite State University for the opportunity.

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Assessment on COVID-19 and its Impact on Hospitality and Tourism Employees during Enhanced Community Quarantine (ECQ) of Western Visayas

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Abstract - This research study aimed to assess the COVID-19 pandemic global outbreak to assess the impact on hospitality and tourism employees of Western Visayas personnel of services accommodation, food and beverage services, attractions, adventure, recreation, and entertainment, meeting, incentives, conference, events (MICE) and Transportation sector employees affected Enhanced Community Quarantine (ECQ) in selected Provinces and Highly Urbanized City (HUCs) of Iloilo provinces and Iloilo City. Mixed methods research approach to inquire involving collecting both quantitative and qualitative data presentation. In its essence, descriptive studies are used to describe various aspects of the phenomenon. In its popular format, descriptive research is used to describe characteristics and/or behavior of sample population. The guiding principle in choosing participants for a Key Informant Interview (KII) was to recruit those who will be information-rich data source that will eventually lead to an in-depth discovery of the issue being investigated. It involves the descriptive method of the data gathered during Enhanced Community Quarantine Period with 375 respondents from Iloilo City and Iloilo Provinces, on hospitality and tourism health psychology, food nutrition, environmental security, economic security, food production availability, and food security, government action on tourism management resulted to "Slightly Agree", while on political stability respondents responded "Agree" in the effect of Enhance Community Quarantine of COVID-19 pandemic.

Keywords - COVID-19 pandemic, Gap and Strategies, Hospitality and Tourism Sector, Local Economy, Impact and Effect of Local Government Units, Western Visayas Region VI

Introduction

Before COVID-19, travel and tourism had become one of the most important sectors in the world economy, accounting for ten percent (10%) of global Gross Domestic Product (GDP) is the standard measure of the value added created through the production of goods and services and more than 320 million jobs worldwide. The global pandemic, the first of its scale in a new era, has put 100 million jobs at risk, many in micro, small, and medium-sized enterprises that employ a high share of women, who represent fifty-four percent (54%) of the tourism workforce, according to the United Nations World Tourism Organization (UNWTO). Disruption to production, initially in Asia, have now spread to supply chains across the world. All businesses, regardless of size, are facing serious challenges, especially in aviation, tourism and hospitality industries, with a real threat of significant declines in revenue, in specific sectors. Sustaining business operations will be particularly difficult for small and medium enterprise (Dogra, 2020). Recently, there around 19 million people either directly employed in the tourism sector, or with related jobs on the tourism "value chain" from restaurant workers to shop owners and their suppliers. Depending on the severity of the drop, between 6.6 and 11.7 million of these jobs could impact through reduction in working hours or permanent job losses (htpps//.www.ec.europa.eu).

Methodology

The study was conducted in Western Visayas during Enhanced Community Quarantine (ECQ) Period of New Normal pandemic. The respondents of the study are the tourism and hospitality sub-sectors employees of Tourism Services (i.e. travel agencies, booking, tours, etc.), Accommodations, Food and Beverage Services, Attractions, Adventure, recreation, and entertainment, Meeting, Incentives, Conference, Events (MICE) and tourist Transportation sector. In gathering data needed for this investigation, on the Effect on Enhanced Community Quarantine on tourism and hospitality community on its impact and effect , to be identified by the respondents as bases for Gap Model for the Pandemic Infectious Disease, checklists based on the a.)Health Psychological Crisis Security; b.) Food Safety, Nutrition and food security; c.) Environmental Security; d.) Economic Security; e.)Availability average value of food production; f.)Access Prevalence of severe food insecurity in the total population; g.)Stability Political stability and absence of violence/terrorism h.) A Tourism Management Plan. The researcher also constructed a survey questionnaire on the required for the environment aspect and community based sustainable tourism sector for this investigation. The researcher used a Mobile Phone-based Web Survey send via electronic copy of a letter of request to the office of the Provincial Governor, Municipality Mayors, City Mayors approval to conduct research to the Directors office of Department of Tourism Region 6 (DOT) to be official, Local Government Units, and Municipality Tourism community tourist area. They were asked to fill out the questionnaires, answer the portal interviews, and participate in answering the questionnaire. After which the responses were statistically tabulated and computed accordingly using appropriate interpretation. For data analysis statistical methods frequency, percentage, key informant interview, cross tabulation analysis employed to obtain data from the respondents.

Moreover, the researcher also utilized secondary data or those obtained from the library, online documents, official memorandums, newspapers/magazines and website techniques to give technical information and data needed in the study.

Results and Discussions

Table 1 shows the result of travel, tourism and hotel respondents resulted: Overall result of Health Psychology resulted to "Slightly Disagree" (24.66%). Behavioral Prevention (physical distancing, wearing face coverings, hand hygiene, and limiting the number of social contacts). "Disagree" (30.00%), Identifying symptoms of COVID-19 and engaging with and adhering to test, trace, and self –isolation/ quarantine interventions. "Strongly Agree" (30.00%), Uptake of vaccination and uptake and/or adherence to other potential future treatments "Slightly Disagree" (31.67%), Coping with the impact of COVID-19 on our lives (trauma and mental health difficulties, bereavement, isolation and loneliness, and longer-term health impacts). "Slightly Disagree" (30.00%), and lastly in terms of Supporting health adaptation to the new normal and its impact our lives and behavior, alcohol use, poor diet, and related anxiety, depressed mood, relationship problems, and elevated stress. "Slightly Agree" (35.00%).

Table 1 Health Psychology

Health Psychology	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. Behavioral Prevention (physical distancing, wearing face coverings, hand hygiene, and limiting the number of social contacts).	0.00	30.00	20.00	20.00	13.33	16.67
2. Identifying symptoms of COVID-19 and engaging with and adhering to test, trace, and self –isolation/ quarantine interventions.	0.00	11.67	20.00	13.33	25.00	30.00
3. Uptake of vaccination and uptake and/or adherence to other potential future treatments.	1.67	20.00	31.67	15.00	11.67	20.00
4. Coping with the impact of COVID-19 on our lives (trauma and mental health difficulties, bereavement, isolation and loneliness, and longer-term health impacts).	1.67	31.67	20.00	30.00	6.67	10.00
5. Supporting health adaptation to the new normal and its impact our lives and behavior, alcohol use, poor diet, and related anxiety, depressed mood, relationship problems, and elevated stress.	0.00	18.33	31.67	35.00	6.67	8.33
Average	**0.66**	**22.33%**	**24.66**	**22.66**	**12.66**	**17**

Table 2 shows the result of travel, tourism and hotel respondents resulted “Slightly Agree” on Food Nutrition (23.33%). COVID-19 puts diets at risk through disrupted health and nutrition services, job and income losses disruption in local food supply chains, and as a direct result of infections among poor and vulnerable people. “Slightly agree” (30.00%), Food price and food security on household appears to be compromised due to extortionate prices. “Slightly agree” (28.33%), Availability of less nutritious food choices with poor quality (possible safety concerns as well). “Slightly disagree” (28.33%), a disrupted food system and prevailing food access restriction during the lockdown. “Disagree” (30%), and lastly in terms Trend where consumption of nutritious food was reduced, while alcohol consumption was high. “Strongly Agree” (30.00%).

Table 2 Food Nutrition

Food Nutrition	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. COVID-19 puts diets at risk through disrupted health and nutrition services, job and income losses disruption in local food supply chains, and as a direct result of infections among poor and vulnerable people.	5.00	15.00	25.00	30.00	10.00	15.00
2. Food price and food security on household appears to be compromised due to extortionate prices.	3.33	20.00	15.00	28.33	8.33	25.00
3. Availability of less nutritious food choices with poor quality (possible safety concerns as well).	0.00	15.00	28.33	25.00	11.67	20.00
4. A disrupted food system and prevailing food access restriction during the lockdown.	0.00	30.00	20.00	20.00	13.33	16.67
5. Trend where consumption of nutritious food was reduced, while alcohol consumption was high.	0.00	11.67	20.00	13.33	25.00	30.00
Average	**1.66%**	**18.33%**	**21.66%**	**23.33%**	**13.66%**	**21.33%**

Table 3 shows the result of travel, tourism and hotel respondents resulted on Environmental Security (22.28%) “Slightly agree”.Human activities that drive climate change and biodiversity loss drive pandemic risk through their impact on our environment. “Agree” (21.6%), Outbreak and its transmission pathway asserted disease passed from animal to humans (zoonotic disease) unprecedented destruction of wild habitats by human activity. “Agree” (31.6%), Workplace safety and health practices ensuring access to decent work and protection of labor rights addressing the human dimension of the crisis. “Slightly disagree” (21.6%), Responding swiftly to the pandemic ensuring humanitarian and recovery assistance in need critical. “Strongly agree” (26.6%), lastly on the Responding swiftly to the pandemic ensuring humanitarian and recovery assistance in need critical. “Disagree” (21.6%).

Table 3 Environmental Security

Environmental Security	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. Human activities that drive climate change and biodiversity loss drive pandemic risk through their impact on our environment.	6.6	10.0	20.0	20.0	21.6	15.0
2. Outbreak and its transmission pathway asserted disease passed from animal to humans (zoonotic disease) unprecedented destruction of wild habitats by human activity.	11.6	10.0	16.6	21.6	31.6	16.6
3. Workplace safety and health practices ensuring access to decent work and protection of labor rights addressing the human dimension of the crisis.	13.3	16.6	21.6	16.6	18.3	13.3
4. Responding swiftly to the pandemic ensuring humanitarian and recovery assistance in need critical.	5.0	10.0	8.3	21.6	20.0	26.6
5. Modern lifestyle, climate change, environmental degradation, exposure to chemical such as endocrine disruptors, and expose to psychological stress factors impact human health negatively.	6.6	21.6	20.0	15.0	13.3	15.0
Average	**8.62%**	**13.64%**	**21.3%**	**22.28%**	**20.96%**	**17.3%**

Table 4 shows the result of travel, tourism and hotel respondents result on Economic Security "Slightly Agree" (18.66%). Global pandemic and public health crisis has severely affected global economy and financial market "Disagree" (25%), Significant reduction in income and rise of unemployment "Slightly Disagree" (30%), Disruption of high pay transportation due to minimal person "Slightly Agree" (31.67%), Significant economic impact reduced productivity, loss of life, business closures, trade disruption, and decimation of the travel tourism and hotel industry. "Slightly Disagree" (21.67%) and "Agree" (21.67%), and lastly in terms with globalization and environmental changes, infectious disease outbreak and epidemics become threats requiring a collective response. "Disagree" (26.67%). To help businesses and individuals mitigate the impact of COVID-19, the country's House representatives approved House Bill 6815 or the proposed Philippine Economic Stimulus Act (PESA) in June 2020. Once passed into law, an economic stimulus package amounting to PHP 1.3 trillion will be provided in the next four (4) years to fund the COVID-19 testing, wage subsidies, and assistance to MSMEs. Under the bill, PHP 58 billion will be appropriated to Department of Tourism (DOT) – accredited tourism enterprise (Impact of COVID-19 on the Philippines Tourism Industry, 2020).

Table 4 Economic Security.

Economic Security.	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. Global pandemic and public health crisis has severely affected global economy and financial market.	3.33	25.00	21.67	20.00	21.67	8.33
2. Significant reduction in income and rise of unemployment.	0.00	21.67	30.00	15.00	18.33%	15.00
3. Disruption of high pay transportation due to minimal person.	1.67	10.00	20.00	31.67	20.00	16.67
4. Significant economic impact reduced productivity, loss of life, business closures, trade disruption, and decimation of the travel tourism and hotel industry.	5.00	20.00	21.67	11.67	21.67	20.00
5. With globalization and environmental changes, infectious disease outbreak and epidemics become threats requiring collective responses.	1.67	18.33	21.67	15.00	26.67	16.67
Average	**2.33%**	**19%**	**23%**	**18.66%**	**18.03%**	**15.33%**

Table 5 shows the result of travel, tourism and hotel respondent's result of Food Production Availability "Slightly Agree" (28.68%). COVID-19 resulted in the movement restriction of workers, changes in demand of consumers. "Slightly agree" (30.0%), COVID-19 resulted in the movement of closure of food production facilities, restricted food trade policies and financial pressure in food supply chain. "Slightly agree" (30.0%), Facilities should change the working conditions and maintain the health and safety of employees by altering safety measures. "Slightly agree" (26.7%), Government policies prevent increased food prices. "Slightly agree" (25.0%), and lastly in terms of Food supply should tighten or loosen the measures according to the spread of pandemic. "Slightly agree" (31.7%).

Table 5 Food Production Availability

Food Production Availability	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. COVID-19 resulted in the movement restriction of workers, changes in demand of consumers.	11.7	16.7	5.0	30.0	21.7	15.0
2. COVID-19 resulted in the movement of closure of food production facilities, restricted food trade policies and financial pressure in food supply chain.	11.7	16.7	10.0	30.0	25.0	6.7
3. Facilities should change the working conditions and maintain the health and safety of employees by altering safety measures.	13.3	13.3	16.7	26.7	20.0	10.0
4. Government policies prevent increased food prices.	15.0	16.7	11.7	25.0	21.7	10.0
5. Food supply should tighten or loosen the measures according to the spread of pandemic.	15.0	8.3	8.3	31.7	28.3	8.3
Average	**13.34%**	**14.34%**	**10.34%**	**28.68%**	**23.34%**	**10.00%**

Table 6 shows the result of travel, tourism and hotel respondents result of Food Security “Slightly Agree” (36.33%). COVID-19 reduced income and disrupted supply chain, chronic and acute hunger. “Slightly Agree” (48.33%), Acute food insecurity “Slightly Agree” (40.00%), Conflict, socio-economic conditions, natural hazards, climate change and pest. “Slightly Disagree” (31.67%), COVID-19 impact on severe and widespread increases of food insecurity, affecting vulnerable household “Slightly Agree” (36.67%), and lastly on COVID-19 related supply disruption, even though global production outlook for major grains remains good “Slightly Disagree” (36.67%).

Table 6 Food Security

Food Security	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. COVID-19 reduced income and disrupted supply chain, chronic and acute hunger.	1.67	11.67	25.00	48.33	13.33	1.67
2. Acute food insecurity.	3.33	10.00	30.00	40.00	15.00	3.33
3. Conflict, socio-economic conditions, natural hazards, climate change and pest.	6.67	25.00	31.67	25.00	11.67	6.67
4. COVID-19 impact on severe and widespread increases of food insecurity, affecting vulnerable household.	1.67	16.67	33.33	36.67	10.00	1.67
5. COVID-19 related supply disruption, even though global production outlook for major grains remains good.	3.33	13.33	36.67	31.67	15.00	3.33
Average	**3.33%**	**15.33%**	**31.33%**	**36.33%**	**13%**	**3.33%**

Table 7 shows the result of travel, tourism and hotel respondents result show on Political stability “Agree” (18.62%). Government on human rights violence during COVID-19 pandemic disaster. “Agree” (21.6%), Physical violence increasingly common places as government enforce lockdown. “Slightly Agree” (23.3%), Pandemic rationale for issuing executive decrees, pushing legislation to expand unilateral powers “Disagree” (21.6%), Government frequently on solid legal grounds to limit civil liberties, militarize, and violate individual rights faced with emergency like COVID-19. “Strongly agree” (21.6%), and on Domestic law often allows for such action during exceptional circumstances, and human rights law under emergency conditions “Agree” (21.6%).

Table 7 Political Stability

Political Stability	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. Government on human rights violence during COVID-19 pandemic disaster.	8.3	18.3	13.3	20.0	21.6	18.3
2. Physical violence increasingly common places as government enforce lockdown.	6.6	16.6	21.6	23.3	16.6	15.0
3. Pandemic rationale for issuing executive decrees, pushing legislation to expand unilateral powers.	16.6	21.6	16.6	16.6	15.0	13.3
4. Government frequently on solid legal grounds to limit civil liberties, militarize, and violate individual rights faced with emergency like COVID-19.	13.3	16.6	16.6	13.3	18.3	21.6
5. Domestic law often allows for such action during exceptional circumstances, and human rights law under emergency conditions.	11.6	20.0	16.6	16.6	21.6	13.3
Average	**11.28%**	**15.3%**	**16.94%**	**17.96%**	**18.62%**	**16.84%**

Table 8 presents Tourism and Hospitality Community on Environmental Security Indicator by Panay Island Perceived by Accommodation Sector Employees result on Assessment on pollution of water, air with in the community “Slightly disagree” (36.6%), Natural vegetation with the employee and hotel guest food

"Slightly Disagree" (36.6%), Land conservation and desertification within the community "Slightly disagree" (36.6%), Concern on environmental problems & waste segregation despite the pandemic outbreak "Slightly Disagree" (26.6%), and lastly in terms of Ability to solve environmental problems & waste segregation with the community "Slightly disagree" (30%).

Table 8 Government Action on Tourism Management

Government action on tourism management	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1. Productivity loss due to lack or remote work capabilities.	11.6	18.3	36.6	16.6	11.6	8.3
2. As change in staffing due to low/slow demand.	13.3	20	36.6	18.3	15	10
3. Separation of Staff (layoffs).	8.3	26.6	36.6	11.6	10	6.6
4. Insufficient staffing to accomplish critical work.	18.3	11.6	26.6	11.6	11.6	5
5.Higher demand for employee protection	10	20	30	18.3	10	11.6
Average	**12.3%**	**19.3%**	**33.28%**	**15.28%**	**11.64%**	**8.3%**

Conclusion and Recommendations

Conclusions

The COVID-19 pandemic outbreak and the economic crisis have mark domestically and internationally negative impact on the hospitality and tourism employees and continue to have implication into the near future critically and almost exclusively depend on hospitality and tourism income.

This unprecedented global health crisis to the entire globe and consequently the tourism, hotel and event sector combating the outbreak and regaining measures on economic performances. This outbreak and spread of COVID-19 disease which decline the international and domestic arrival that loss the revenue of the hospitality and tourism business a rapid negative impact on the country travel, tourism and hotel industry.

Some of the impacts of COVID-19 on travel, tourism and hotel industry include increased cancellation of hotel and travel bookings and increased cancellation and rescheduling of events in the entertainment industry, resulting in billions of peso's revenue lost and millions of travel, tourism and hotel job loss.

Recommendations

Based on the findings of this study, the following recommendations are made: There is no doubt, that this pandemic situation has brought lot of negative impact to the travel, tourism and hotel industry of Iloilo and Bacolod City.

1. A digital resource platform with social media profiles, to empower marketing strategies to promote e-marketing strategies alternative to create to provide different option for business or institutional business alternative.

2. Destination rebranding is very much essential with domestic travel market will significantly grow compared to the international tourism market to release the home bound stress of the communities as an alternative continuous touch with the key customer based collaboration with necessary stakeholders locally to maintain a strong linkage.

3. Finally, it is recommended to initiate collaborative strategies among academia to see the indirect effects of the outbreak the pandemic locally and among public sector. Local Government Units (LGUs) could look into the status of travel, tourism and hotel sector for both micro and macro level business owners and operators of their employees affected of job loss for alternative scheme of sources of income.

Acknowledgement

The researcher would like to acknowledge the support of the respondents and the management of this research study conducted.

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Work-Life Balance, Work Performance and Job Satisfaction of White Collar Employees in a Work-At-Home Setup

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Abstract - This study aimed to determine the level of work-life balance, work performance, and job satisfaction among 210 white-collar employees in a work-at-home setup in Cavite. This started September 2020 to June 2021. Using the purposive sampling technique, this correlational research revealed that white collar-employees who work-at home had a high level of work-life balance and an average level of work performance in terms of task performance, conceptual performance and counterwork productive behavior. It also revealed that white collar-employees who work-at home had a satisfied level of job satisfaction in relation to supervision, co-workers and nature of work, an ambivalent level of job satisfaction relative to pay, promotion, fringe benefits, contingent rewards, operating conditions, communications. It is also reported that there was a significant relationship between work-life balance and work performance in terms of task performance, conceptual performance and counterwork productive behavior; work performance relative to conceptual performance and counterwork productive behavior and job satisfaction; work-life balance and job satisfaction. Whereas there was no significant relationship between work performance relative to task performance and job satisfaction.

Keywords - Work-at home, employees, work performance, work-life balance, job satisfaction

Introduction

In the Philippines, a law formalizes the option for employees to work at home or work remotely outside the workplace, known as Republic Act No. 11165 or the “Telecommuting Act”, it declares telecommuting as an alternative work arrangement that employers may implement upon agreement with their employees (Mckenzie, 2019). As coronavirus pandemic emerge, it makes telecommuting more necessary, and many more organizations had their operations disrupted and upturned amid the observance of quarantine and social distancing, tons of workers—mostly in white-collar industries such as tech, finance, customer services, knowledge, and media—were thrust into a sudden, chaotic experiment in working from home. Thus, the expectations of more flexible work arrangements are increasing, which may potentially impact employees’ level of work-life balance, work performance, and job satisfaction.

Before the pandemic struck, working from home seemed like an incredible perk for many employees. Unfortunately, working from home is not proving to be the dream experience that many employees were anticipating. Aside from the technical issue, working from home can upset the balance between an employee’s personal and professional life, which in turn can heighten their stress levels, resulting in poor management skills and affect their overall health (Eternity, 2020). Therefore, maintaining a healthy work-life balance is not only important for health and relationships, but it can also improve employee’s productivity, and ultimately performance.

Since most of the employees are working from home for the first time, employee’s work performance is on the line. Much of the knowledge, information and assistance people depend on is cultivated by the spontaneous and informal conversations they have with colleagues in shared workspaces, and the absence of which might diminishes their efficiency (Adonis, 2020). Measuring and managing employee’s performance outside the traditional workplace gives employers the ability to properly gauge worker’s efficiency, determine how to properly compensate employee’s workforce, and improve the employees’ overall performance.

Furthermore, there is much debate regarding the importance of job satisfaction and why companies should pay special attention to it. First and foremost, employers must understand that people are most productive when they have a favorable environment that allows them to perform to the best of their abilities

(Jonathan3, 2020). Most organizations strive for employee satisfaction, but not all attain this goal. That's why it's important to know more about the factors that can increase employee satisfaction, especially during work-at-home.

Work-at-home setup is still in its infancy in the culture of working arrangement in the Philippines. Given this situation, it is necessary to provide empirical evidence to this account. This paper aims to contribute to the limited literature on this topic by examining the level of the work-life balance, work performance, and job satisfaction of the participants. More specifically, the current research examines the relationship between work-life balance, work performance, and job satisfaction of white-collar employees in a work-at-home setup.

Methodology

Quantitative method was utilized to gather numerical data from the participants, and correlate the relationship of work-life balance, work performance, and job satisfaction among white-collar employees in a work-at-home setup using Spearman-rho and Pearson R. Purposive sampling technique was used to select the participants of the study, a total of 210 white-collar employees residing in Cavite and with at least 3-months experienced or on-going work-at-home setup was selected among the population. Work-life balance inventory, individual performance scale, and job satisfaction scale were used instruments in the study.

Results and Discussions

Table 1. Level of Work-life Balance of the Participants

	Mean	SD	Remarks
Work Interference with Personal Life	22.46	5.44	High
Personal Life Interference with Work	13.77	4.14	High
Work/Personal Life Enhancement	14.54	3.71	High
Overall Work-Life Balance	50.77	10.04	High

Legend for WIPL:		Legend for PLIW and WPLE:		Legend for Overall:	
Mean Value		Mean Value		Mean Value	
35-20	High	20-12.5	High	75-40	High
19.9	Low	12.49-5	Low	39.99-5	Low

Comprehensively, the participants yield a high level of work-life balance which means that participants had a less interference in terms of their work to personal life and personal life to work, and high enhancement in terms of their work and personal life. It shows that working from home shown a better work-life balance to its employees. Similarly, Grant et al. (2013) stated that working from home had a positive impact in improving work-life balance, because work-at-home employees found it possible to combine work-life and non-work life. Working from home facilitates a strong work-life balance. They get to customize their surroundings to suit their personal and work needs, get comfortable with their preferred outfits and tech setup, and take care of physical and emotional needs as they come up.

Table 2. Level of Work-life Balance of the Participants

	Mean	SD	Remarks
Task Performance	2.89	0.82	Average
Contextual Performance	2.81	0.89	Average
Counterproductive Work Behavior	1.15	0.90	Average

Legend for TP:		Legend for CP:		Legend for CWB:	
Mean Value		Mean Value		Mean Value	
5-3.33	Very High	5-3.25	Very High	5-2	Very High
3.32-3	High	3.24-2.88	High	1.99.1.6	High
2.99-2.17	Average	2.87-1.88	Average	1.59-0.8	Average
2.16-1.84	Low	1.87-1.38	Low	0.79-0.41	Low
1.83-0	Very low	1.37-0	Very low	0.4-0	Very low

The result shows that the participants yields an average level of individual work performance in terms of task performance. It means that they had an average of proficiency when it comes to performing the central task of their respective jobs. On the other hand, the participants also obtained an average level when it comes to their conceptual performance. It means that participants had an average level of initiative to do extra behavior and action beyond their central tasks Rhoades & Eisenberger (2002) showed in their meta-analysis that perceived organizational support affect employees to show organizational citizenship behavior or discretionary behavior that is beyond their task that facilitates organizational effectiveness. This OCB may not only be focused to the organization, but also to the employees' supervisor or colleagues from who they receive work-at-home support, for example helping a colleague with a difficult task. In other words, individuals who are committed to their organization, satisfied with their jobs, feel they are treated fairly, and perceive their leaders as supportive are more likely to increase their conceptual performance. Moreover, the participants also obtained an average level in terms of their counterproductive work behavior. It means that the participants had an average level of behaviors that are directed toward the immediate supervisor, work colleagues, or the organization itself that is harmful to its well-being. They put a less effort into work, and sometimes deliberate sabotage of work achievements. As mentioned by Singh (2020), work from home requires continuous monitoring and recording, intensifying negative emotions like mistrust among employees and organizations. These negative emotions are not only affecting at the individual level but also at the team level.

Table 3. Job Satisfaction of the participants

	Mean	SD	Remarks
Pay	14.8	2.59	Ambivalent
Promotion	14.6	2.34	Ambivalent
Supervision	16.99	4.40	Satisfied
Fringe Benefits	13.3	3.21	Ambivalent
Contingent Rewards	14.68	4.14	Ambivalent
Operating Conditions	12.74	3.08	Ambivalent
Coworkers	17.60	3.80	Satisfied
Nature of Work	17.01	3.75	Satisfied
Communications	15.78	4.31	Ambivalent
Overall Job Satisfaction	137.55	17.94	Ambivalent

Legend for subvariables:

Mean Value	Verbal Interpretation
24-16	Satisfied
16-12	Ambivalent
12-4	Dissatisfied

Legend for overall:

Mean Value	Verbal Interpretation
216-144	Satisfied
144-108	Ambivalent
108-36	Dissatisfied

Overall, work-at-home employees denotes an ambivalent feeling towards job satisfaction. It was supported by the concept of motivation-hygiene theory by Hezberg (1959). He pointed out that motivating factors (also called satisfiers) are primarily intrinsic job elements that lead to satisfaction, such as achievement, recognition, the (nature of) work itself, responsibility, advancement, and growth. What Herzberg termed hygiene factors (also called dissatisfiers) are extrinsic elements of the work environment such as company policy, relationships with supervisors, working conditions, relationships with peers and subordinates, salary and benefits, and job security. These are factors that can result in job dissatisfaction if not well managed. His research leads us to understand that we cannot think of satisfaction as the antithesis of dissatisfaction but rather view the two as separate, mutually exclusive entities. The presence of satisfaction as opposed to the absence of satisfaction and the presence of dissatisfaction as opposed to the absence of dissatisfaction would be a better way of understanding this concept.

Table 4. Relationship between Work-life balance and Work Performance

Indicator	Spearman's Rho Correlation	P-value	Remarks
Work-life balance and Task Performance	.231**	0.001	Reject H_o
Work-life balance and Contextual Performance	.147 *	0.034	Reject H_o
Work-life Balance and Counterproductive Work Behavior	-.276 **	0.000	Reject H_o

Legend:
For ** - Accept Ho - if P-value is ≥ 0.01
Reject Ho - if P-value is ≤ 0.01
For * - Accept Ho - if P-value is ≥ 0.05
Reject Ho - if P-value is ≤ 0.05

Based on the result, task performance obtained a positive relationship towards work-life balance. It means that whenever a work-at-home employees manage to balance their work and life, it could have an impact towards their performance as an employee, especially during work-at-home setup (vice versa). They can still to their job exactly as they would in the office, while managing to their jobs at their home. This result of the study was in alignment with past research conducted by Magnini (2009) wherein he found out that work-life balance also contributes to increasing employees' in-role performance. The experience of psychological well-being and harmony in life helps employees concentrate on their work, resulting in better task performance.

On the other hand, conceptual performance also obtained a positive relationship towards work-life balance. Balancing work and life is essential in attracting employee to have the initiative to perform extra duties while working at home, despite that it somehow contradicting to the notion of work-life balance. A study findings have also supported by the empirical survey carried out by Organ, Podsakoff and MacKenzie (2006) with the bottom line that work-life balance appears to promote employee's engagement in organizational citizenship behaviors or discretionary behaviours beyond the expected normal duties in which may benefit the organization through positive affectivity. The significant correlation between teamwork of work-life balance with all the dimensions of organizational citizenship behaviors found in this study was found to be consistent with prior research findings, suggesting that 'when both coworkers and supervisors are supportive of an employee, that employee may be more satisfied with his or her job and develop emotional attachments to the organization' (Bragger et al., 2005; Rousseau & Aube, 2010).

In addition, counterproductive work behavior has a negative significant relationship towards job satisfaction. It means that whenever an employee is satisfied with his/her job, it is more likely for them not to get involved into behaviors that are directly impacted their job performance and job satisfaction (vice versa). As stated by Fapounda, (2014), when employees do not have work-life balance, they are less productive, are absent more, and display more deviant workplace behaviour (Shakir & Siddiqui, 2014). Similarly, Lasisi, Okuneye and Shodiya (2014) reported that work-life balance positively correlates with counterproductive work behavior. Moreover, an imbalance between work and line domains has been reported to relate to increase in the incidence of stress, which can lead to other negative behavioural outcomes that affect organizational productivity and staff performance.

Table 5. Relationship between Work performance and job satisfaction of the participants

Indicator	Spearman's Rho Correlation	P-value	Remarks
Task Performance and Job Satisfaction	0.059	0.396	Accept H_o
Contextual Performance and Job Satisfaction	.150 *	0.030	Reject H_o
Counterproductive Work Behavior and Job Satisfaction	-.267 **	0.000	Reject H_o

Legend: For ** - Accept Ho - if P-value is ≥ 0.01; Reject Ho - if P-value is ≤ 0.01; For * - Accept Ho - if P-value is ≥ 0.05; Reject Ho - if P-value is ≤ 0.05

Based on the result, task performance has found to have no significant relationship towards job satisfaction. The rationale why job satisfaction behind that result is because task performance usually recognized as a formal requirement of an individuals' job, therefore whether an employee is satisfied with the job or not, the tasks have to be accomplished especially during work-at-home setup. These findings are supported by the study conducted by Edwards, Bell, Jr., and Decuir (2008) found that there was a weak relationship (r =.19) between job satisfaction and task performance.

Contextual performance on the other hand, found to have significant relationship towards job satisfaction because employees may be more likely to perform extra duties, endorse, support, or defend the organization's objectives, or engage in other contextual behaviors if they have high levels of satisfaction with the job. Similarly, Van Scotter, J. R (2000), also agreed with the result of his study where he found that employees whose contextual performance was higher also reported being more satisfied with their jobs and more committed to the organization. Finding that task and contextual performance predict different outcomes supports the distinction Borman and Motowidlo (1993) made between task performance and contextual performance.

In addition, counterproductive work behavior also found to have a negative significant relationship towards job satisfaction. Employees who are highly dissatisfied with their work are more likely to engage in counterproductive work behavior to express their discontentment. It was supported by Samnani et al. (2014) where they stated that dissatisfied employees are more likely to have greater negative behavioral reaction. Similarly, a study conducted by Yean, Johari and Yahya (2016) revealed in their regression analysis a significant relationship between job satisfaction and counterproductive work behavior (p value= .001). They concluded that their study finding provide adequate evidence that job satisfaction is the "driving force" that provoke employees to exhibit counterproductive work behavior.

Table 6. Relationship between Work-Life Balance and Job Satisfaction

Indicator	Pearson Correlation	P-value	Remarks
Work-life Balance and Job Satisfaction	.494	0.000	Reject H_o

Legend:
Accept Ho - if P-value is ≥ 0.01
Reject Ho - if P-value is ≤ 0.01

Based on the results, work-life balance and job satisfaction was found to have high significant relationship. Work-life balance can be associated with job satisfaction of work-at-home employees because work-life balance is the equilibrium between the amount of time and effort an employee devotes to work and personal activities, and any changes to the equilibrium affects the overall sense of harmony between life and work including employees' job satisfaction.

A study conducted by Russo, Suñe and Ollier-Malaterre, (2014) reveals that work-life balance was significantly related to job satisfaction (path coefficient = .50, p b .001). Similarly, Gaur and Saminathan (2018) agreed that private and work-life balance have positive and strong relation with employees' job satisfaction. They concluded that the more workers feel they have control over their working environment; the more they are able to balance work and family. Conclusion of overall analysis is that work-life balance in organization can be achieve only after enhance employees' autonomy and increase their capability to perform well in work and in family scenario.

Conclusion and Recommendations

The findings of the study show that positive relationship exists between work-life balance and work performance which means that there is a significant relationship between the said variables, therefore, work-life balance can be associated with work performance of work-at-home employees because work-life balance is the equilibrium between the amount of time and effort an employee devotes to work and personal activities, and any changes to the equilibrium affects the overall sense of harmony between life and work including employees' work performance.

In the context of relationship between work performance and job satisfaction, task performance found to have a negative relationship which means that there is no significant relationship between the before mentioned variables, therefore it means that work-at-home employees are professional enough to perform and do their respective task, regardless if they feel satisfied or dissatisfied with their job. Moreover, positive relationship exists between conceptual performance and job satisfaction, wherein it denotes that an employee may be more likely to perform extra duties, endorse, support, or defend the organization's objectives, or engage in other contextual behaviors, if they have high levels of satisfaction with the job (vice versa), especially during work-at-home setup where they have more autonomy when it comes to their time. On the other hand, the findings of the study show negative relationship exists between counterproductive work behavior and job satisfaction, it denotes that employees who possess dissatisfaction are those unhappy/unsatisfied with their job experiences, more often with work-at-home employees who are forced to sudden change in organizations and employees' surroundings, and not giving them enough time to adjust, may have caused uncertainty about the future and allowed them to behave negatively towards their job responsibilities.

Lastly, a positive relationship also exists between work-life balance and job satisfaction, which means that they have a significant relationship, which means that balancing the division of energy between the different aspects of a person's life, especially family, friends and work are essential in achieving better work-life balance which in turn can affect their job satisfaction. Job satisfaction typically increases with improved life balance, which in turn increases employee loyalty, creativity and productivity. Employers should acknowledge work-at-home employee's efforts to strike a balance between work and personal life.

Moreover, for the participants, as the result of the study shows that working from home has its fair share of (really great) benefits especially in terms of employees' work-life balance, but that doesn't mean there won't be struggles as you adjust to this new way of working, it is recommended to maximize the potential of this work-at-home working arrangement.

For organizations/firms, since the study shows that working from home helps employees' in balancing their work and personal life, it is recommended to use the result of the study to create better work-at home policy, programs, and seminars to maintain and improve work-life balance which in turn can also improve their work performance and job satisfaction if ever this work-at-home economy will continue. It is also recommended to create seminars and programs that will minimize employees' counterproductive behavior which can affect their work performance and job satisfaction.
For the field of Psychology, it is recommended to create programs that will help the industrial sector in minimizing employees' counterproductive behavior in which it could also help in promoting job satisfaction and improve work performance as well.

For the future researchers, since the study utilized a study size sample, it is highly recommended to use the population sample instead to provide better assessment regarding work-at-home employees. It is also recommended to further study the socio-demographic profile of the participants, specifically, age, gender and status, to test whether it could also be a factor in determining work-life balance, work performance and job satisfaction of work-at-home employees (Parpart, Connelly and Barriteau (2000); Wang, Lawler and Shi (2010), Martins et al. (2002)).

Acknowledgement

Towards accomplishing the final manuscript, the researchers would like to give profoundest recognition to those who helped and extended their supports which really help to complete and achieve the purpose of this research.

The researchers are also grateful for the kindest cooperation of the participants for giving their time in answering the questionnaires which really help to complete and achieve the purpose of this research.

The researchers beloved and supportive parents, who are very understanding and patient throughout the process of research-writing, their invaluable moral and financial support made me achieve greater improvements in this research and in life.

Above all, the researchers want to offer this endeavor to God Almighty, for the wisdom, strength, hope and power in conquering obstacles I had as I aim to share this work to other people.

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Influence of Corporate Philanthropy to Employer Branding as Perceived by the Future HR Practitioners

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Abstract - Employer branding is a marketing technique that assists businesses in remaining competitive in their respective marketplaces. Even though it has been in use for over 30 years, its procedure and ramifications have yet to be thoroughly investigated (Gregorka, 2017). Corporate philanthropy, on the other hand, is the act of providing help for the overall development of a community. It is a corporate effort that ostensibly improves the company's brand image. The aforementioned area, which has yet to be completely explored, is a research gap that requires attention, especially at this time of the pandemic. This study aims to determine the respondents' level of awareness towards employer branding and corporate philanthropy, identify the organizations that exhibit corporate philanthropy during the COVID-19 Pandemic, and determine the influence of corporate philanthropy on employer branding in the perspective of future HR practitioners. Also, to develop a model to address the arising challenge for companies in funding request assessment. This model will also be used as a guide in accomplishing this paper. This paper used a descriptive research method using the Likert Scale in analyzing the weighted means of the collected data. Based on the results, the respondents are moderately aware of employer branding, extremely aware of corporate philanthropy, and strongly agree as to the influence of corporate philanthropy on employer branding. The Acceptance of Philanthropic Requests Decision Model is also presented in this paper. With this, the researcher recommended for the companies to have more relative recruitment initiatives in this new normal, develop a program that will help newly hired employees to learn and adapt to the new normal working environment, and for the companies to develop corporate philanthropic activities relevant to the revival of education in the Philippines.

Keywords - Corporate Philanthropy, Employer Branding, Branding, Human Resource Management, Corporate Social Responsibility

Introduction

The COVID-19 Pandemic brought global challenges beyond what human society is made to be prepared for. The need to extend help to others reached past financial assistance up to mental health care. At this time of crisis, many organizations came into action to take part in the delivery of the basic needs of the people. Such action is part of the so-called Corporate Philanthropy. Having engaged in these good faith activities leads to a positive corporate image that yields a higher level of employer branding. This Employer Branding is the overall image that one company is reflecting the public as an employer. If one company does have a higher Employer Branding, it can attract more applicants with a higher level of qualifications. Bottom line, it lessens the recruitment expenses per se of the company.

The purpose of this study is to learn more about the role of corporate philanthropy in the employer branding strategy, which is often associated with the company's CSR efforts. Through a favorable reputation and legitimacy, a company's CSR activities and strong human resource procedures may help retain highly skilled personnel. Better internal legitimacy and reputation would lead to stronger organizational identification, which would lead to greater organizational commitment. One indicator of employee loyalty is organizational commitment, which is one of the objectives of an employer branding plan.

CSR may benefit business by boosting its corporate image, strengthening brand, and inspiring as a business owner, according to Katie Schmidt, the creator and main designer of Passion Lilie. Corporate responsibility is growing in importance, and having a socially conscious image is becoming increasingly vital. When it comes to picking a brand or firm, consumers, workers, and stakeholders are beginning to consider CSR. They hold companies responsible for social change through their corporate values, actions, and profits. It all sums up what Corporate Philanthropy is all about.

Methodology

This study aims to determine the level of knowledge of the respondents towards corporate philanthropy and employer branding, identify the organizations that exhibit corporate philanthropy during the COVID-19 Pandemic, and determine the influence of corporate philanthropy on employer branding in the perspective of future HR practitioners. Also, to develop a model to address the arising challenge for companies in funding request assessment. This model will also be used as a guide in accomplishing this paper. These future practitioners are the BSBA major in Human Resource Management (HRM) students of Batangas State University ARASOF-Nasugbu Campus. The researcher believes that their perspectives in the field of HRM would be vital in achieving the objective of this study.

To achieve the objectives of this study, the researcher used a descriptive research method since the said research design aims to cast light on current issues or problems through the process of data collection which will enable the researcher to describe the situation more completely. This study used both qualitative and quantitative data to determine the level of awareness of the respondents to employer branding and corporate philanthropy. It was also used to answer the perception of the respondents on the influence of corporate philanthropy on employer branding. It involved the collection of qualitative data that were tabulated along a continuum in numerical form. On the other hand, qualitative data helped to draw conclusions based on the result of the study. The descriptive Likert-type survey method was used to describe the data collected as presented in the tables in the result section.

The participants of this research are the fourth year Bachelor of Science in Business Administration major in Human Resource Management of Batangas State University ARASOF-Nasugbu with a total population of 94 students. The respondents are knowledgeable about the importance of philanthropic activities for organizations as part of their corporate social responsibility. Their perspectives as future HR practitioners are valuable in the conduct of this study as one of their core functions may be influenced by these good deeds, i.e. recruitment. The data were gathered using a survey questionnaire that was made accessible using Google Form.

Results and Discussions

In data analysis from the 94 respondents, different areas were explored to better conclude this research. The level of awareness of the respondents to employer branding and corporate philanthropy, the list of companies that were active in providing help during the pandemic, and the influence of corporate philanthropy to employer branding as perceived by the respondents were presented on the following tables.

Table 1. Level of Awareness about Employer Branding

Level of Awareness about Employer Branding	Extremely Aware	Moderately Aware	Somewhat Aware	Slightly Aware	Not-at-all Aware	Weighted Mean	Verbal Interpretation
1. It has a positive reputation and culture.	20	47	6	21	0	3.7021	Moderately Aware
2. The good leadership of the management is evident.	22	46	11	15	0	3.7979	Moderately Aware
3. There is a positive feedback to its working environment.	49	38	6	1	0	4.4362	Extremely Aware

4. Competitive compensation and benefits package.	25	45	12	12	0	3.8830	Moderately Aware
5. It provides learning opportunities and programs to support employee development.	42	45	6	1	0	4.3617	Extremely Aware
6. Clear policies that are well-implemented by the management.	29	49	5	11	0	4.0213	Moderately Aware
7. A great place to work.	51	38	3	2	0	4.4681	Extremely Aware
8. Provides a sense of belonging to entering talent.	35	47	11	1	0	4.2340	Extremely Aware
9. Bringing new and innovative products and/or services in the market.	49	39	5	1	0	4.4468	Extremely Aware
10. Contributes to community development.	44	44	5	1	0	4.3936	Extremely Aware
Total						4.1745	Moderately Aware

The result shows that the respondents are moderately aware of what employer branding is. Having an initial background as senior HRM students helps in the level of their awareness. The ability of the company to bring new and innovative products in the market also presented significant influence in making a positive public image that leads to brand development. Though compensation and benefits signify the least weighted mean since it is internally confidential, still it stands for a moderate level of awareness that is a good indicator that the company is doing well. Employer branding means how a business is perceived by job seekers and their workforce. It tells the world what it's like to work there, reflecting their leadership, values, and company culture (Skills Platform, 2021).

Table 2. Level of Awareness about Corporate Philanthropy

Level of Awareness about Corporate Philanthropy	Extremely Aware	Moderately Aware	Somewhat Aware	Slightly Aware	Not-at-all Aware	Weighted Mean	Verbal Interpretation
1. It involves the act of donating to a charity or a foundation whose mission is to fight a cause and deliver social impact.	56	31	7	0	0	4.5213	Extremely Aware
2. It is meant to be driven by a desire to make a social change.	47	38	9	0	0	4.4043	Extremely Aware
3. It is engaged in activities like monetary investments, donations of products or services, in-kind donations, employee volunteer programs and any other business arrangements which aim to support a social cause.	35	31	8	20	0	3.8617	Moderately Aware
4. All of the ways in which companies achieve a positive social impact through strategic and generous use of finances, employee time, facilities, or their own products and services, to help others in the community and support beneficial causes.	46	42	6	0	0	4.4255	Extremely Aware
5. It may gather funds to help others in need.	56	32	6	0	0	4.5319	Extremely Aware
6. It may have an access to sophisticated investment options and financial management to grow charitable giving.	29	48	7	10	0	4.0213	Moderately Aware
7. It relies on a charitable giving team's expertise for community knowledge and to meet urgent needs.	25	39	21	9	0	3.8511	Moderately Aware

8. It has the ability to entice high employee engagement, employee retention and the ability to attract top talent.	41	43	10	0	0	4.3298	Extremely Aware
9. Contributes to community development.	61	28	5	0	0	4.5957	Extremely Aware
10. It is entitled to tax exemptions.	26	40	22	6	0	3.9149	Moderately Aware
Total						4.2457	Extremely Aware

As clearly presented on the table, the respondents are extremely aware of what corporate philanthropy is due to the fact that corporate social responsibility (CSR) is its most popular example. Corporate philanthropy and corporate social responsibility are similar concepts that often overlap in practice. In fact, the relationship between CSR and philanthropy is often barely distinguishable from each other, as the terms are sometimes used interchangeably. Often, philanthropy is integrated into a bigger picture corporate social responsibility plan. Both are positive concepts designed to deliver corporate resources to the community the corporation serves, and the giving may also be aimed toward specific causes (Lazzari, 2018). Its contribution to community development is the clearest aspect of corporate philanthropy while its partnership with charitable giving teams earned the least weighted mean but still presents a moderate level of awareness.

Table 3. Influence of Corporate Philanthropy to Employer Branding

Influence of Corporate Philanthropy to Employer Branding	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Weighted Mean	Verbal Interpretation
1. It helps to create a positive public perspective.	55	31	2	6	0	4.4362	Strongly Agree
2. It boosts company morale.	56	33	4	1	0	4.5319	Strongly Agree
3. It turns the organization's internal arsenal into brand advocates	36	50	8	0	0	4.2979	Strongly Agree
4. It helps create deeper connections and increase employee engagement.	35	39	6	14	0	4.0106	Agree
5. It helps attract and retain top talent that helps your business improve performance.	35	44	9	6	0	4.1489	Agree
6. It helps increase sales.	54	34	5	1	0	4.5000	Strongly Agree
7. It improves customer loyalty.	56	34	4	0	0	4.5532	Strongly Agree
8. Provides bigger networks.	51	41	2	0	0	4.5213	Strongly Agree
9. It helps people and the community to have access to things they usually would not have the ability to have.	51	36	7	0	0	4.4681	Strongly Agree
10. It improves the organization brand's reputation with employees, customers, prospects, partners, and the community at large.	63	28	3	0	0	4.6383	Strongly Agree
Total						4.4106	Strongly Agree

It can be gleaned from Table 3 that the majority of the respondents strongly agree that corporate philanthropy influences employer branding. The level of their awareness of these two variables is a good indicator of the validity of the result of this study. Corporate Philanthropy is a way for organizations to extend their help to the people and community as well. Organizations that extend their blessings also encourage a higher level of integrity thereby improving the organization brand's reputation with its stakeholders that is clearly shown on the table. Though having deeper connections and increased employee engagement received the least weighted mean, still it reflects a high level of agreement of the respondents. Employer brand can either be growing or dying, there is no in-between (Barrow & Mosley, 2005). But since it is fueled with various HR and organizational initiatives, like corporate philanthropy, it brings a positive image to the market thereby increasing its profile as an employer.

Corporate Philanthropy Activities during Pandemic

Amid the rising number of corona virus in the country, some of the biggest businesses have provided aid to frontline workers and employees affected by the pandemic. Presented in table 4 is the list of Philippine companies that provided aid during the Corona Virus Pandemic.

Table 4. List of Companies who provided aid during COVID-19 Pandemic

Name of the Organization	**Aide Given**
Aboitiz Foundation	Medical supplies
Adobo Connection	Foods
Alliance Global Incorporated (AGI)	Medical supplies
Araneta City	Waiving of rentals, advanced employee salary, and foods
Asian Terminals Incorporated (ATI)	Temporary quarantine facility
Ayala Corporation	Employee wages and waiving of space rentals
Bank of China Manila Branch	Medical supplies
Bloomberry Resorts Corporation	Medical machine and supplies
Bounty Agro Ventures Incorporated (BAVI)	Foods
CDO Foodsphere	Temporary shelter and medical supplies
Clark Development Corporation	Medical supplies and foods
Coca-Cola Philippines	Medical supplies and foods
Davao City Chamber of Commerce and Industry, Incorporated (DCCCII)	Medical supplies
Eagle Cement Corporation	Foods
eBET	Medical supplies
FWD Life Insurance Corporation	Enhanced insurance coverage and medical supplies
Globe Telecom	Donations, employee support, connectivity needs, and promos
Hotel Sogo	Temporary lodging for front liners
International Container Terminal Services, Incorporated (ICTSI)	Medical supplies and foods
ING Philippines	Cash donation

Among the listed 50 companies, only the first 20 are listed in this table due to the presentation capacity of this paper. This clearly shown the philanthropic initiatives of the Filipinos in the face of these companies. They have extended aid in different areas like medical supplies, foods, temporary shelter, employee support, even waiving of space rentals, and others. The Bayanihan soul of the Filipinos is always present in times of need. These companies are the basis of the respondents in accomplishing the survey questionnaire.

	Aware	Unawareness
Align	**Accept**	**For Listing**
Not Align	**For Discussion**	**Decline**

Figure 1. Acceptance of Philanthropic Requests Decision Model

Overflowing requests for assistance to the companies is the arising concern that must also be addressed because most of these requests are no longer aligned with the purpose of the company. To address this, the researcher developed this model to help companies to have an objective-based decision whether to accept the funding request or not, especially this pandemic.

The alignment of the philanthropic request to the organization's core commitment must be considered. This ensures that the organization will fund or extend its help to entities whose commitment and objectives support the organization's core mission. This keeps the organization on track with its philanthropic journey. Next is the awareness of the requisitioning entities on their real purpose. Not just to publicize their organization by bringing the brand of the well-known company in the picture. This model is also divided into 4 quadrants. First is the Accept quadrant that includes philanthropic requests that are both aligned in the organization's core mission and their level of awareness on what is their purpose and on how they will utilize the requested fund or assistance. The second is For the Listing quadrant that includes a request that is aligned but the requisitioning entities are not aware as to what is their main purpose and have no clear plan on how the fund or assistance will be utilized. The third is For Discussion quadrant that includes requests that are not aligned with the organization's core mission but the awareness of their purpose is clear on the requisitioning entities and there is a clear plan as well as to how to utilize the fund or the assistance needed. Fourth is the Decline quadrant that includes requests that are both not align and the requisitioning entities are not aware of their purpose and no clear plan as to how the fund or the resources will be utilized.

This model will address the common challenges in accepting philanthropic requests with clear and objective parameters.

Conclusion and Recommendations

As Corporate Philanthropy contributes to community development as a whole, its significance and influence were cannot be hidden. It creates a positive influence on the company image as a whole including its aspect as a good and competitive employer. Based on the results of this study, first, the researcher does suggest for the company to have more relative recruitment initiatives in this new normal. True indeed that having a positive employer brand greatly helps in pooling competent applicants but the challenge now is how to effectively and efficiently evaluate these applications using the new preliminary recruitment guidelines that restrict them to do it traditionally due to health and safety protocols. Second, develop a program that will help newly hired employees to learn and adapt to the new normal working environment positively. As the scope of this study includes the graduates of flexible learning whereby most of their courses were taught online. And Third, for the companies to develop corporate philanthropic activities relevant to the revival of education in the Philippines. Not only it helps the community as a whole, but it will also impliedly create a better employer brand image.

Acknowledgement

The researcher appreciates the opportunity provided by the Adventist University of the Philippines for research-related undertakings in its graduate programs nurturing professionals for academic excellence. The researcher would like to acknowledge as well the commitment of Dr. Corazon T. Banaga in giving her students broader perspectives and more complex understanding of the management of funds, donations, and foundations and its underlying topics where I sourced out this research paper.

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Social Marketing as an Intervention to Poverty Management Amidst the Pandemic

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Abstract - The Novel Corona Virus, or more commonly known as Covid-19, has already devastated the global economy, needless to mention the loss of human life. Unlike the previous "once in a century" pandemics (i.e. The most recent was the Spanish Flu), this epidemic might have a drastic and longer-term effect since it has plunged every aspect of the worldwide Political, Economic, Social, Technological, Legal and Ecological (PESTLE) with less than a quarter of a year. Although mankind will surely recover and will not go silent thru the night, nonetheless, it may take years or even decades towards a complete recovery. This, obviously affects the mindset of just about everyone.

In the midst of such socio-economic upset, there is a concept that is aptly called Social Marketing. This is considered as one of the most recently growing practices that are used to address the lingering problems of the society. Widely used to address public health issues, this tool serves as a very promising intervention to check societal-related predicaments.

Given such, and in line with the current economic repercussions brought about by the pandemic that further aggravated poverty, this prompted the researcher to study the effectiveness of the aforementioned tool as a new intervention to address the Median Urban Poverty Issues of the – Philippines. The still novelty of this paradigm can prove to be beneficial to address the lingering poverty effects of the pandemic.

Keywords - Poverty Management, Social Marketing, Median Urban Poor

Introduction

The Coronavirus Disease of 2019 (COVID-19) is a highly fatal and fast spreading infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The case of this disease was identified in December 2019 in Wuhan, the capital of China's Hubei province, and has since spread globally, resulting in the ongoing 2019–20 coronavirus pandemic. Common symptoms include high fever, cough and shortness of breath. Other symptoms may include fatigue, muscle pain, diarrhea, sore throat, loss of smell and abdominal pain. The time from exposure to onset of symptoms is typically around five days, but may range from two to fourteen days, or even up to a month. While the majority of cases result in mild symptoms, some progress to acute and viral pneumonia and multi-organ failure. Since that dreadful day, millions have already been infected and have died, though the recent social awareness and the vaccines have proven to be effective in gradually "winning this generational health battle."

Availability of medical resources and the socioeconomics of a region may also affect mortality. Estimates of the mortality from the condition vary because of those regional differences, but also because of methodological difficulties. The under-counting of mild cases can cause the mortality rate to be overestimated. However, the fact that deaths are the result of cases contracted in the past can mean the current mortality rate is underestimated (Partington and Wearden, 2020).

In the Philippines, last 30 January 2020, the Department of Health reported the first case of COVID-19 in the country with a 38-year-old female Chinese national. On 7 March, the first local transmission of COVID-19 was confirmed. WHO is working closely with the Department of Health in responding to the COVID-19 outbreak. The country was placed into a series of lockdonws, nationally known as community quarantine – which still lasts up to this writing – at different levels depending on the number of cases. As of this writing, all-time cases are in the six digits, but the overall active cases are down to a mere or approximately a thousand per day average. Vaccines have proven to be effective as deaths are in check with only dozens per day while active recoveries are almost equal to the active cases.

Despite of such, the overall economic impact and social instability remains prevalent as there is no clear and definitive date or manner as to how the government can achieve a new normal status.

Poverty

Poverty is a condition or as experts say a "disease" of the society that is traditionally characterized by the lack or insufficiency of basic human needs, such as potable water, sufficient nutrition, health care, essential education, clothing and shelter, because of the incapacity to afford them. However, this term is relative, like in some developed countries; the measurement of poverty is manifested by the condition of having fewer resources or less income than others within a society or country, or compared to worldwide averages (Sachs, 2005).

About two-third of the total number of people live in absolute poverty, which is currently described by the World Bank and International Monetary Fund (WB-IMF) as those whose daily income is within the $1.27 base. As such, the formal term for this near absolute lack of resources is formally called "Extreme Poverty," while the condition of being below the norms of developed societies is called "Relative Poverty" (e.g. a family who could be considered poor in a developed country might be a middle class in a developing one due to the high discrepancy in GDP per capita, family income and purchasing power / disposable income).

More importantly, the fundamental issue in poverty is not on the foregone issues, for these are only the effects. The most critical is the mind-set of the poor, or simply, the poor thinks that they will forever be poor, and that they are the moral and economic obligations of the taxpayers and the government (Cheung YL, Tan W, Ahn HJ, Zhang Z, 2010). Their mind-set is already conditioned to this notion, with very little hope of self-dignity and room for growth. Worse, they become parasites and over dependents. They do not believe in the society, that the latter could never help them, along with the children, and their future per se, in uplifting their social disease.

Matched with the pandemic, the poor is more so being pushed further at the brink since the already access to scarce resources and incapability to acquire such is further aggravated by the effects of Covid-19.

The table below demonstrates the overall classification of poverty.

Classification of Poverty (Source: Lectures of Dr. Conrado Montemayor and Dr. benedict David in Poverty Management, University of Santo Tomas Graduate School, 2010 - 2014; Bobson School of Business, University of California, Los Angeles, 2010)

Criteria	**Entrepreneurial Poor**	**Laboring Poor**	**Employed Poor**	**<u>ULTRA Poor</u>**
Business Fluency	At least relative fluency on practical business	May have very little or knowledge at all on business	May or may not have practical knowledge on business	No business literacy
Literacy Level	Literate	Little or no literacy	Literate	Little or no literacy

Source of Income	Steady source of income, though limited	"Per day" source of income	Steady but insufficient source of income	No source of income
Examples	Could be: Owners of small general merchandise stores, underground businesses, farmers	They are the daily wagers such as carpenters and nannies	They are: the typical wage or salary-paid employees	They are: **BUMS, POTENTIAL PETTY OFFENDERS**

Social Marketing

Social marketing, as conceived by Philip Kotler and Gerald Zaltman in the 1970's is defined as the systematic application of the theories, concepts, techniques and strategies of marketing to achieve a specific goal of uplifting a distinct social good through the empowerment of behavioral goals (www.thensmc.com). It can be applied to either promote a beneficial product, or otherwise be strategically used to constantly persuade people to refrain from using or patronizing a certain demerit or harmful product. For example, this may include asking people not to smoke in public areas, asking them to use seat belts, or prompting to make them follow speed limits. Kotler, Roberto and Lee (2002) define Social Marketing in this way:

"Social Marketing is the use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify or abandon a behavior for the benefit of individuals, groups, or society as a whole."

Quite a number of international and local organizations have already stepped up their respective advocacies to promote this rising marketing trend. The most widely used reference for the practice is from the National Social Marketing Center, a British Social Marketing organization that advocates such noble causes of this campaign.

Nevertheless, as aforementioned, the so-called "movement" is fast spreading across the globe, as many countries start to adopt this concept as part of their social responsibility or social welfare campaigns. More so, it has a two-dimensional facet – the "social parent," which is focused on social welfare through policies and guidelines, and the "marketing parent," or the actual application and practice of this concept (Kotler, Roberto and Lee, 2002).

Lastly, it could also be practically – though not entirely – form a part of a Corporate Social Responsibility program of a business entity. This could be attributed to the fact that the latter is primarily guided by policies such as Corporate Governance, Environmental Laws, and Triple Bottomline Objectives – to name a few (Kennedy, 2010). On the other hand, Social Marketing is emanated on the sheer promotion and utmost encouragement of an advocacy – without an actual mandate imposed.

More so, Social Marketing is a tool focused on providing choices to the consumers – to develop their awareness that could eventually lead to voluntary advocacy on what is beneficial or harmful. This is in direct opposition to the typical social upliftment programs of imposing and mandating policies or rules.

Or simply, Social Marketing is a multi-faceted field of practical knowledge that is aimed on improving various aspects of a certain society.

Economic Impact

Every government and economy want to see the virus contained and finally be given an antidote – a vaccine, per se. This has been the case since early this year. Yet, the economy still doesn't seem to show signs of quick recovery. Risks in overall equity and assets remain vulnerable to additional selloffs and at worse, total company closures. However, there are some silver linings. The pandemic has increased the demand for medical products, especially face masks and test kits in an effort to avoid spreading and/or catching the virus. More so, the demand for food has since soared even further (Islam, 2020).

Many countries with large economies have already lifted its quarantine protocols due to the vaccines. But the recurrence of new strains put the total economic rally at bay. This has led to the disruption of business activities in many economic sectors. Developing countries are also forecast to be severely impacted by the coronavirus. Daily wage earners have shown to be the most affected since they at a "no-work-no-pay" employment contract. Every government thru their respective local government units are ardently trying to fill this void by providing amelioration packages and relief goods supplies, as well as some well-off enterprises rendering some financial aid.

These factors contribute to poverty and its aggravation as employment becomes harder, especially for those who are below, within and barely above the poverty line.

Social Marketing and Poverty Management

Social marketing can be used to remind the poor to save, to allot a portion of their income for their everyday and emergency needs. Just as aforementioned, they could be reminded to not just drink moderately, but also to limit their number of bottles or cigarette sticks, among all their possible vices. In addition, they could also be reminded that having too many children will definitely cause extreme poverty, with pictures and depictions of such untoward and disappointing scenario, like a couple holding nearly a dozen babies and do not have any food to eat. There are already existing campaigns on this Social Marketing, but none is predicated on poverty management. More so, the persuasion factor is low, as it lacks the needed punch and appeal. Maybe through this, they could be enlightened.

Kotler and Lee (2009) in their book emphasized that poverty goes beyond mere economic insufficiencies. The theory of social exchange (or defined as the act or practice of a person to choose alternatives or options wherein they could utterly gain) was utilized and given focus, while on the other hand, the notion of paternalism (which is based on the needs of the poor as perceived by the rich) was evidently discarded due to the lack of comparison between the attributes of the two (2) bipolar socio-economic classifications. In addition, the authors also used the traditional marketing mix to implement their claim about the exchange theory – that is, a good product or service must be "sold" to the market in order for them to advocate that certain offering – which would help them alleviate their current poverty status.

For instance, in the area of health, contraception and overpopulation, in order for the poor to graduate from the levels of poverty, they must in exchange, use certain methods such as oral rehydration, condoms or mosquito bed nets. Once they start purchasing these items, or at least receiving it, they will now have a certain leg up. Meaning, instead of getting sick due to malaria, it can be prevented since they bought a mosquito net. Instead of having more children due to unwanted pregnancies, they could limit the number, using condoms.

As a result, the poor will now start to develop a sense of purpose, and a certain feeling that they could become more productive due to the "items" that they have advocated. This, according to various studies, is one function of Social Marketing to manage poverty – as a means to encourage the target market to patronize something that will have an effect in the long run.

In addition, they could also be taught via reminding them to follow the basic social discipline practices and rules. For instance, proper crossing of the street, pedestrian lane loading and unloading, etc. These factors, no matter how trivial, also promote progress since it reflects our culture and way of life. If

Filipinos could muster enough discipline in these basic laws, they could also muster even more on this complicated poverty issues.

All that is needed is a proper reminder, which is also sincere and direct to the point.

Problem Rationale

This research validated if Social Marketing if used as a tool would become an effective intervention in managing the median urban poverty level, particularly the laboring poor through vice control.

This is attributed to the fact that vices are considered as habits that aggravate poverty due to its nature of further disrupting a poor person's already meager budget (Carr, 2008; Hoppe, et al, 2010). More so, as of the moment, there is no definitive study conducted to analyze the benefits of Social Marketing towards poverty management.

In detail, the research is focused on how could Social Marketing help manage poverty by creating a new method of instilling public and social welfare by reminding them to be disciplined enough in their respective lives as Filipinos, family members and distinct individuals. In the process, this will help them heal the social disease that affects their mindset.

For instance, the poor consider livelihood programs as dole outs, as they do not really cultivate the assistance that they receive, they even use it on their vices. This practice must be checked. And Social Marketing is the fundamental tool to achieve this goal, since it affects the audience's attention, if the method is striking and properly presented. This will be the focal point of the study – to create means to make social marketing effective in reducing median urban poverty by also reducing the vices of people.

In detail, the study provided answers on how to:

1. Profile the poor's behavioral perception / mindset about poverty (This will determine their level of optimism with regards to their current state of life).
2. Inoculate a social marketing program that emanates on discipline and creating a positive mindset and determine its effectiveness.
3. Determine the effectiveness of social marketing as a new intervention in managing the median urban poverty.

Study Frameworks

There were multiple theoretical frameworks for this research, the first tiers are focused on how the program would be carried out in order to achieve the study objectives. On the other hand, some parts presented an abstact / illustration on what kind of product would be introduced to the target audience – the median urban poor, per se.

The fundamental theory that this study is predicated to is from the research of Becker and Murphy (1988). As described on the previous part of this dissertation, their study utterly emphasized that there is indeed a mindset factor that affects the addiction of a certain person, especially if the person is already discounting his future. In the process, the more manifestation of this bad behavior and inappropriate foresight, the worse it would become for that certain addicted person as a whole.

Next, the Social Marketing aspect / basis of this study was patterned after the study of Gordon (2012). The illustration is as follows:

This paradigm clearly illustrates how social marketing – especially the marketing mix, the lifeblood of any marketing scheme – is interrelated to achieve a desired goal. The study itself discussed how to retool the social marketing paradigm in order to more effectively cater and serve a broader scope of recipients, in order to properly communicate the desired social outcome.

Based on the illustration on the following page, the consumers – the target audience subject for the social change / upliftment, is at the center (which is rightfully so) of the diagram. This is for the obvious reason that every marketing scheme should be focused on satisfying the market – the consumers, per se. This holds true even for Social Marketing, in fact it should have a better perspective and crafting of its marketing mix since the expected outcome is focused on the behavioral and mindset improvement of a certain target audience – not just mere profit generation as what the traditional marketing entails.

To acheive consumer empowerment, there are certain efforts that need to be implemented. As indicated on the paradigm, there is orientation, or the proper inoculation of the Social Marketing scheme towards the mindset of the target. Then there is the involvement of the community and the participants – which are centered on actual social upliftment and empowerment. These could be the promotion of livelihood programs and control of certain indivdual habits (e.g. vices) that add-up to the detriment of the holistic well-being of a person, among many more.

Another is the value perceived – which is co-created and practiced once the program begins to be internalized by the recipients – the consumers, which is the result of a thorough research, indoctrination, and immersion to the social upliftment programs.

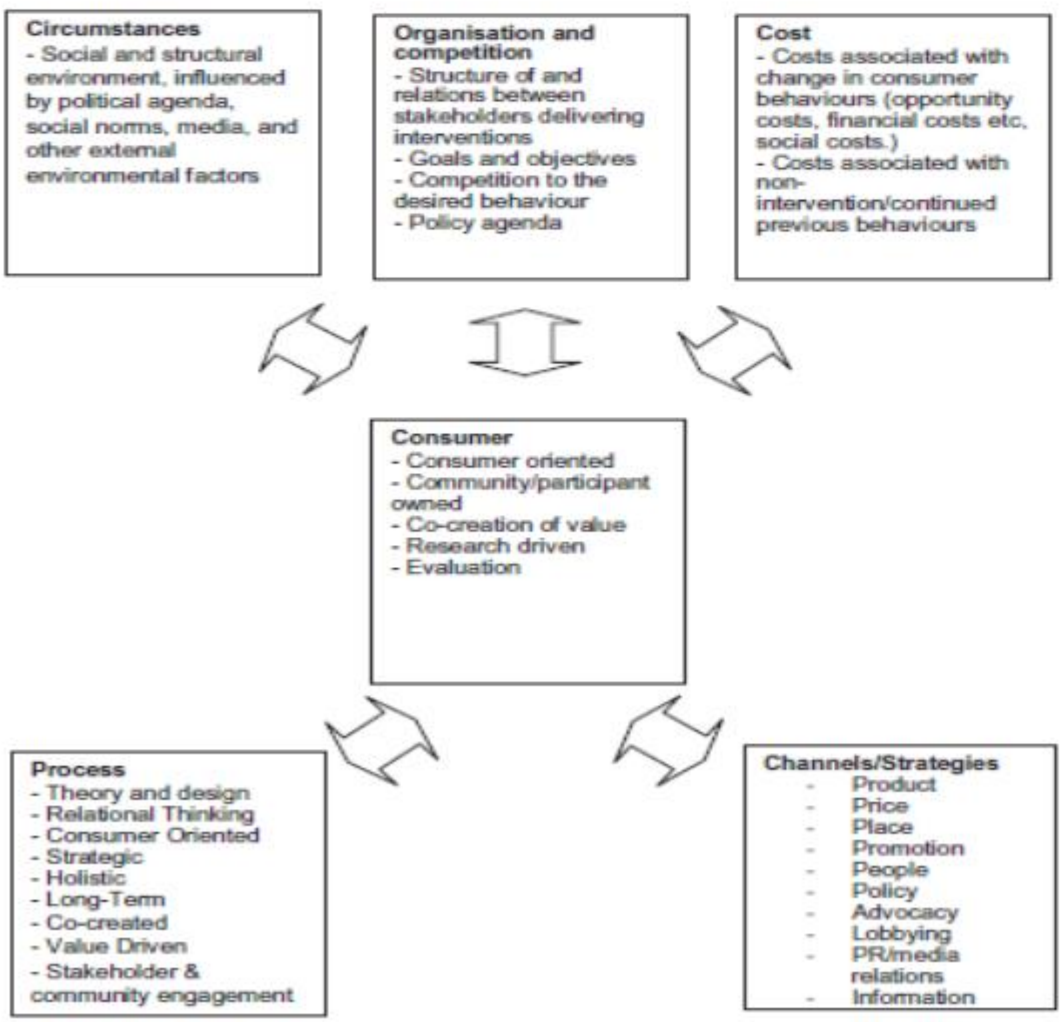


Fig. 1. Proposed social marketing mix.

Revolving around the center (the consumers) are the variables that condition the overall well-being of the target audience. These variables are described and explained as follows:

1. Process – These are the tools that are needed to implement and to make the social markeitng mix happen and be successful. The figure clearly states that for a certain social upliftment to happen, it must have the aforementioed factors such as the holistic value and benefit of the program, the need for a long-term commitment of advocacy and social change, and the engagement of all sectors involved in order to make it happen, among many other aspects.
2. Circumstances are the external factors that condition the current status of the target audience – the reason of why they are such, per se. For instance, if poverty alleviation is the focus of a certain Social Marketing scheme, then the underslying causes, in order for these to be resolved, must be identified. And the only way to identify this is through studying the environment where the target audience lives and interacts.
3. Organization and competition refer to the entities involved towards the implementation of the program. Included on this part are their respective objectives, strategies and goals to ensure that the social marketing effort would be a success.
4. Cost pertains to the expense or trade-off that the certain initiators of the Social Marketing paradigm could be paying in exchange for the desired social upliftment goal. It also pertains to what the consumers – the target audience that is – may also have to deliver and pay in order to achieve that certain objective. For instance, the cost for the consumers if it would pertain to poverty alleviation may be the effort to reduce certain habits that contribute to their current state of life; while the cost for the initiators may be the time, effort and resources that would be spent to change the target market for the better.
5. The channels and strategies are the specific media or methodologies that are needed to carry out the program. This is the actual marketing mix of the campaign. For example, the initiators may use simple awareness methods such as word-of-mouth, posters and other prints that encourage the target to change by upholding a life that is in accordance to the program objective.

Another framework used was adopted from the types of social change paradigm by Levy and Zaltman (1975). Their model simply describes that in order to achieve a higher level of social change there should be a manifestation of initiative that is focused first on the micro level – the individuals, themselves. The following illustration details this process:

Figure 1.5: Types of Social Change by Time and Level of Society

	Micro Level (Individual)	Group Level (Organization)	Macro Level (Society)
Short-Term Change	Behavior Change	Change in Norms (Administrative Change)	Policy Change
Long-Term Change	Lifestyle Change	Organizational Change	Sociocultural Evolution

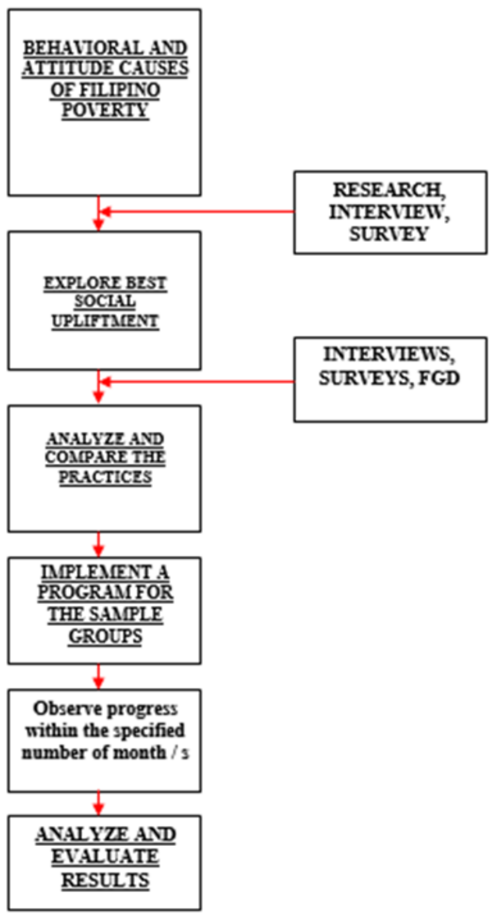
Source: Adapted from Sidney Levy and Gerald Zaltman. 1975. *Marketing, Society, and Conflict*. Prentice Hall.

The paradigm explains the obvious – which simply describes that even the small things, when sustained and consistently practiced - always lead to greater achievements. These include a higher self-discipline, higher valuation of self-worth and most of all, the manifestation of utmost change in the mindset of the people affected. As presented above, the slightest but consistent behavioral change could eventually lead to a longer-term turnaround – the change of lifestyle. This in turn, will definitely affect an entire organization, and even the society itself since each person is starting to set an example on how to properly think, act and behave. This is definitely a goal of Social Marketing – encouraging the target audience to change their mindset, for the better, which in turn will also affect others.

Methodology

The overall flowchart of the research as well as the diagram of pertinent methodologies was illustrated on the following page. The detailed explanation and overall synthesis were written and described on the pages that followed the models being presented.

Specifically, the first flowchart discussed the entire research, from the proposal stage up to the final stage of data interpretation – where the actual results and conclusions could be derived for recommendations. Following that tier was the research design model, where the step-by-step process of obtaining information was described, from the pre-screening data gathering to validate the research, to the benchmarking part up to the actual implementation of the social marketing program. Lastly, the final part evaluated the effectiveness of the program.



Research Type

The study was primarily descriptive and causal in nature. The profile of the people under study was described in such a way that their current socio-economic status, budgeting and habits (especially on vices) were intrinsically determined and analyzed using a set of structured questionnaires, which was facilitated through interviews, surveys and FGDs. A number of secondary data was also used to validate the responses of the sample group with regards to other researches / related literature.

In addition, since this research determined the eventual effects of vices with regards to poverty, thus the fundamental causes of such were determined – hence, making the study also causal in nature. It also has a bit of exploratory research, since the introduction of a social marketing program is new to the Philippine and Vietnamese setting.

In determining the sample groups, the selection of the specific communities studied was selected using purposive sampling. That is, the researcher consulted with the Catholic Bishops' Conference of the Philippines (CBCP) to identify the most poverty-stricken communities in Metro Manila. This method was suggested by a Deacon who is actively involved within the said organization. CBCP, through the reports of each diocese and parishes, keeps a record of economically deprived communities across the archipelago, in order for the organization to craft specific spiritual and practical outreach programs to assists each parish that is stricken by poverty. A total of 200 respondents were chosen for the study.

Research Design

This research was divided into several parts. The first part served as the pre-screening process to determine the direction and template of the study. A Focus Group Discussion on one group of respondents living within the poverty threshold was conducted. The next tier determined the psychological aspects that could influence poverty such as behavior, attitude, influence and societal influences, among other relevant factors.

To conduct this tier, a one-shot research design method using a survey was conducted on families on selected urban communities that has obvious evidences of poverty. The following examples are, among many more, considered as the psychological factors that are deemed to have at least a relatively negative contribution to the social and income status, as well as the purchasing power of the poor under study in buying basic needs. These are the most prevalent vices in the society, as exemplified by the number of people who are under influence. That is, even at a young age, Filipinos already manifest these vices, which obviously affect them for the rest of their lives.
(http://www.eastwestcenter.org/sites/default/files/private/POPwp10807.pdf)

1. Smoking - The excessive purchase of cigarettes for a poor person is deemed to contribute to his lower capability to buy his basic needs as well as certain luxuries since instead of prioritizing the latter, that person tends to first consider satisfying his vice.
2. Alcohol Drinking – Just like the aforementioned, this disrupts the budget of an individual – or even a family – since the already meager money that should have been spent on more important necessities are wasted just being thrown away on this vice, just like the rest.
3. Gambling – Another instance where the supposed budget for necessities are used for this mischievous activity. This vice, unlike the other two (2), has the greatest potential for monetary loss since the individual is deceived to bet more, especially if he is winning at first. However, as he starts losing, the addiction enters his psyche, which now leads to an eventual vice, with the same results as aforementioned.

After the survey results and benchmarks have been analyzed and should there be any manifestations of any, or at worst all, of the aforementioned psychological factors in terms of poverty, and should any best practice be applicable, the study proceeded to the next research design level – the actual implementation of a social marketing program.

This part used the conventional marketing communications strategy of using posters, banners or tarpaulins in every household and on the community halls to promote the benefits of curtailing the frequency and controlling the psychological vices that the groups under study are indulged into. More so, to further reinforce the study a brief community learning activity to educate the residents about the program shall be requested. This short program reminded the possible effects of the above-mentioned vices on the purchasing power of an individual – which is believed to have more impact than the conventional health risks that are commonly discussed. This is of course with reference to the results gathered overseas which served as a pattern.

Altogether, these programs, especially the latter ones, took at least six (6) months to accomplish. By the end of slightly over a quarter year, a concrete result whether the program has been a success or not was derived. After the study period has lapsed, the researcher requested the community leaders to still continue and sustain the advocacy, should it be proven to be effective – to truly contribute to the society.

The determinants whether the program introduced unto the target group has succeeded or not were based on the following factors:

1. Increased family budget – the more money allotted for the pertinent family expenses such as allowance for the children, more food on the table and more savings are clear indicators that the program has been effective, at least during the given timeframe. It only means that their purchasing power has increased not because of an increment in wage or work earnings, but on how efficient the heads of the respective families are in planning and managing their resources.
2. Overall family satisfaction – a rather altruistic but strong determinant of an effective program. This is the descriptive and psychological result of having achieved the foregoing criterion. Or simply, it is just quite obvious that a family will be happy and satisfied each time they have more food on their table, the children's parents are not fighting over petty things caused by vices – particularly over money, per se, and they are living a healthy lifestyle.

Overall, these determinants are critical to the success of this program since it gauged aspects that could be measured quantitatively, as well as qualitatively and psychologically.

Sample Size and Sampling Design

A total of 200 respondents were used as the sample profile for the actual implementation of the program under this study. More so, to further add substance to the study, a modified cluster sampling method was used on the respondents. They were divided into groups in order to determine a more extensive and comparable progress of the program.

Data Collection Instrument

For the first part – in identifying whether the causes of poverty are influenced by the behavioral, attitude, societal and psychological factors of an individual or group - a structured questionnaire obtained the needed information. The questionnaire composed mostly of structured questions in two forms - dichotomous and multiple categories. Some of the questions offered a fixed number of variables while some were open-ended; thus, enabling the respondents to express personal preferences.

For the second part – in determining the progress of the sample under study, the same format of questionnaire was used. Only in this part, a follow-up rating scale was added, as with a corresponding data analysis / statistical treatment methodology to determine the actual improvement of an individual or family that has been exposed under the social marketing programs. The results were then interpreted to answer the hypothesis presented on the first chapter.

Data Analysis

The study used tables, charts and graphs in analyzing, interpreting and presenting the data obtained from the research. This study also utilized the following tools:

1. Basic tabulations and interpretation of data – this process provided and tabular presentation and a qualitative interpretation on the basic responses of the sample groups. This was done in order to fully grasp the essence of the respondents' perceptions.
2. Mean Ratings – this statistical tool determined the perception of the respondents based on certain poverty inquiries raised unto them. For instance, their perception about what made and still making them poor were assessed and measured using this method.

Ethical Considerations

This study asked the permission of the respective community authorities in carrying out the research. This was followed by asking the permission of the respective families that were purposively selected to participate in the program.

First, the leaders were asked to have a private dialogue, wherein an internal arrangement was agreed upon to conduct the study within their locale. Monetary payment or gifts, whichever was applicable based on each circumstance, was given for their trouble. Once the agreement was reached, the researcher, his aides and the community leaders approached one by one the chosen families for the study.

In general, majority of the families selected agreed, those who refused were immediately replaced without much hassle. The fundamental agreement between the researcher and the families were as follows:

1. The families were monitored – through actual visitation - by the researcher and / or his aides and contact every month regarding their progress until their respective program duration had already lapsed.
2. For all the trouble, just like their leaders, they were given either financial or in kind compensation as they underwent the program.

Significant Pre-Screening Findings

Below contains the summary of the Pre-Screening FGD conducted to validate the study and provide an overview regarding the research proposal at hand. The sample group was taken from 12 (though only 10 showed up) local heads of families of an impoverished community in Metro Manila. The discussion was conducted at the residence of one respondent.

Pertinent findings suggest that the general perception of poverty among the respondents is consensus. That is, they consider poverty as an inborn condition – that they are born poor and will have an arduous time adjusting and achieving personal and family progress. Their family budget is approximately PhP 200 per day with an average family household number of five (5) members.

Each respondent confessed smoking, drinking and gambling. Altogether, they dare drinking only every Friday, but spend too much money on beer, as they consume over seven (7) bottles per "drinking session." They buy cigarettes individually from an underground street vendor, and they smoke at least five (5) cigarettes per day. More so, they gamble also every Friday and they have an average bet of PhP 20 on each try until their pockets run dry. Due to this fact, they admitted that with their limited budget and income, their purchasing power is really affected.

When they were asked about social marketing efforts such as advertisements, they stated that they see such on media, particularly on television. Unfortunately, they do not pay much attention because they only call it as lip service on the part of the media and the firms.

However, they do admit that if a credible source, but they emphasize that it should not be the government, will teach them patiently on how to save and discipline themselves, there is a possibility that they would help themselves progress. When asked why they do not prefer government efforts, they said that they do not utterly trust which ever administration is at office, and they are not registered voters.

The following table briefly discusses the FGD:

<table>
<tr><th>WORK</th><th>INCOME (PhP)</th><th>FAMILY MEMBERS</th><th>VICES</th><th>AWARENESS OF SOCIAL MEDIA / MARKETING CAMPAIGNS</th></tr>
<tr><td>Respondent 1: Carpenter</td><td>400 per job</td><td>4</td><td>Smoking (at least 5 sticks per day)

Drinking (once a week, 8 bottles)

Gambling (once a week, spends PhP 20 minimum)</td><td rowspan="3">Aware but does not pay attention

Does not trust the government due to corruption

Willing to participate in a social marketing program but they insist on just limiting but not utterly removing their vices. Important note: They emphasized that the facilitator must be very good to convince them to limit their vices and really prove that their lives will really improve</td></tr>
<tr><td>Respondent 2: Public Utility Driver</td><td>400</td><td>5</td><td>Smoking (at least 7 sticks per day)

Drinking (once a week, 5 bottles)

Gambling (once a week, spends PhP 10 minimum)</td></tr>
<tr><td>Respondent 3: Carpenter</td><td>450 per job</td><td>5</td><td>Smoking (at least 5 sticks per day)

Drinking (once a week, 3 bottles)

Gambling (once a week, spends PhP 25 minimum)</td></tr>
<tr><td>Respondent 4: Welder</td><td>500 per job</td><td>7</td><td>Smoking (at least 5 sticks per day)

Drinking (once a week, 8 bottles)

Gambling (once a week, spends</td><td>Aware but does not pay attention

Does not trust the government due to corruption

Willing to participate in a social marketing program but they insist on just limiting but not utterly removing their</td></tr>
</table>

			PhP 30 minimum)	vices. Important note: They emphasized that the facilitator must be very good to convince them to limit their vices and really prove that their lives will really improve
Respondent 5: Carpenter	500 per job	4	Smoking (at least 5 sticks per day) Drinking (once a week, 7 bottles) Gambling (once a week, spends PhP 30 minimum)	
Respondent 6: Sales Merchandiser	7,500 / month	5	Smoking (at least 8 sticks per day) Drinking (once a week, 10 bottles) Gambling (once a week, spends PhP 20 minimum)	
Respondent 7: Janitor	7,500 / month	5	Smoking (at least 4 sticks per day) Drinking (once a week, 6 bottles) Gambling (once a week, spends PhP 50 minimum)	Aware but does not pay attention Does not trust the government due to corruption Willing to participate in a social marketing program but they insist on just limiting but not utterly removing their vices. Important note: They emphasized that the facilitator must be very good to convince them to limit their vices and really prove that their lives will really improve
Respondent 8: Waiter	8,500 / month	3	Smoking (at least 7 sticks per day) Drinking (once a week, 3 bottles)	

			Gambling (once a week, spends PhP 25 minimum)	
Respondent 9: Plumber	450 / job	5	Smoking (at least 7 sticks per day) Drinking (once a week, 6 bottles) Gambling (once a week, spends PhP 40 minimum)	
Respondent 10: Electrician	600 per job	5	Smoking (at least 5 sticks per day) Drinking (once a week, 3 bottles) Gambling (once a week, spends PhP 50 minimum)	

Results And Discussion

The local practice of Social Marketing in the Philippines could be defined as a gradual-moving progress, as the efforts are not consistent enough to manifest significant changes. This holds true particularly in the nation's capital. In fact, the already minimal efforts are not really considered as pure social marketing at all due to its penalties imposed on violations. This scheme defeats the very essence of social marketing since the latter is focused on voluntary improvement through initiative.

For instance, the Republic Act 9211 (RA 9211 or the Tobacco Act of 2003), which has been extensively implemented at the start of July 2011, has since become the highly publicized social effort a few months ago despite the fact that it already has been passed as a bill way back in 2003. This clearly manifests the fact that the progress of social marketing – social effort – per se, is moving at a slower pace, as it took exactly eight (8) years to be publicly enforced, under the initiative of the Metro Manila Development Authority. People's reaction to this enactment is mixed and highly diversified, stating relative pessimism that this movement will be sustained for the longest time.

However, there is one city-province in the archipelago where the enforcement of all its social marketing and social welfare practices are strict and meticulously sustained. That certain "local benchmark" is Davao City. Davao has clearly exhibited sustainability and utterly enforced its mandate and authority in inoculating and instilling the virtue of discipline among its residents. The city was even commended and awarded by the neighboring South East Asian Countries, citing the city's dedication to uphold social good (SEATCA, 2010).

For one, in terms of the macro social welfare, each taxi cab in the city should provide an official receipt to a passenger upon payment. This was done to ensure the safety and convenience of every citizen. Failure to do such would mean a memo directly coming from the City Hall, calling the attention of the franchise operator. Subsequent fines and other disciplinary measures shall also be given depending on the gravity of the offense.

On the other hand, in terms of social marketing efforts, Davao is strictly particular in the "Anti-Smoking" law in public places. An automatic fine shall be imposed even on the first time violators, while a mandatory incarceration or "jail time" shall be the verdict, with gravitated fines, for perennial offenders. More so, to further promote the cause, billboards, banners and other community service announcements are scattered along the vast city (Villarreiz, 2009). These are hung from nearby commercial centers, hotels and universities (i.e. one beside Ateneo de Davao, see appended file).

Thus, based from the aforementioned, it is determined that social marketing efforts to improve public welfare in the Philippines still needs improvement. Although there is one promising city that could serve as a benchmark, still, every region should ardently advocate and pattern their respective programs to such a dedicated effort. The lack of studies that focus on social marketing only defines the fact that this social welfare is still very immature in the Philippine milieu. Only one province and one city – the nation's capital - of the entire archipelago and all it's quite a number of progressive cities – have social marketing campaigns. More so, the social marketing campaigns are not even pure at all and are not focused on poverty management. There are penalties for each frequency and gravity of violation committed – which defeats the purpose of social marketing of voluntary progress and initiative.

Therefore, if Davao has a tight grip on its enforcement of social welfare upliftment to promote public health and welfare, then, the same paradigm could also used in Poverty Management – the same level of discipline and advocacy. However, it needs refinement; and in terms of social marketing, it should be "reformulated" to become a voluntary basis for the target audience's part.

Another just recently ratified policy is the implementation of the Sin Tax Law, that, just as its title strongly suggests, intends to increase the taxes imposed on certain "sins and vices" such as tobacco and alcohol. In the process, the government hopes that when these goods are charged at higher rates, the manufacturers will pass the burden of cost to the consumers, which in turn, the consumers will start to limit their purchase of such items due to the price increments.

Altogether, if these campaigns will be promoted more and be strictly implemented, then, the gist of this research would be further reinforced. Since the mindset of the people – particularly the poor – will start to shift, for the better. The foregoing programs could serve as a jumpstart for more social empowerment.

Objective One Responses

This area of the study refers to the mindset and impression of the respondents towards poverty. And from the given survey conducted, it is determined that poverty is indeed a multi-faceted predicament, with many anchors and predications that linger across the society and the economy.

La Vina (2011) on his lecture during the International Convention of Social Protection held at the University of Santo Tomas created a metaphor comparing poverty to a monster that has many hearts. And in order to defeat hi so-called social tyrant, every heart must be stabbed simultaneously using all possible poverty alleviation means (e.g. microfinance, micro enterprising and social enterprising, among many more). Given such, it is now concluded that his metaphor is valid, for according to the respondents' mindset, they believe that is has many areas to consider.

Going further, based on multiple responses of the participants, they have utterly indicated that poverty is indeed a social disease, with majority (60%) attesting to this claim. This answer further reinforces the idea of Hoppe, et al (2010) that poverty is like an ailment that affects the mentality of an individual – that is, pushing him to think that the structure of the society is definitely unequal and unfair.

In addition, more than half (55%) of the respondents indicated that poverty could be classified as an inevitable life situation. When further probed, they said that it is an unfortunate life status that they have inherited from their parents who refused to fight for the upliftment of their standard of living. Chossudovsky (2003) in his book clearly emphasized this social and economic state, citing it as a structural problem of any given nation, which, according to his research, is attributed to the fact of the innate inequality of wealth distribution existing among countries and its citizens.

The results were unanimous: they simply stated that corruption is just the offshoot of a long-running malpractice that they reasonably phrased as "unequal levels and unequal distribution of wealth among the people of the society or government since time immemorial and has been carried out until up to this point" or social inequality, in short. Thus, social disease and structural inevitability, as what experts suggest, could indeed qualify as the mindset and perception of the poor about their current dismal standard of living.

Perception about Poverty	
Base: Number of Respondents	**Percentage**
Social disease with lack of financial discipline	60
Inevitable life situation	55
Curse	20
Others (including corruption)	15

Relation to Vices

The respondents who answered lack of financial discipline, upon further probing, revealed that vices do indeed play a part on their current status in life – which according to them is degrading and vicious (this will be further discussed on the following sub-topics). Some of their admissions are as follows:

> "Bisyo ang isa sa mga pangunahing dahilan" (My vices are primarily one of the primary reasons why I am poor).
>
> "Siguro kung wala ako bisyo, baka kahit pano mas maayos ako kasi mas kaunti ang gastos ko at hindi ako nagkakasakit, kaso hindi talaga maiwasan." (Maybe I am better off in life, and even healthier sans my vices, however, this cannot be helped).

Hence, this further proves two things:

1. Vices can be identified as a form or effect of the lack of financial discipline – which directly attributes to the reasons of poverty; and

2. The social disease aspect of negatively affecting the poor's mindset – which comprises multi-faceted characteristics and attributes - is truly valid, as what the respondents claim.

Outlook on Poverty Alleviation

This aspect solicited their honest opinions whether they still believe that their current standard of living could be resolved and uplifted.

Clearly, nearly nine-out-of-ten (89%) still have faith among themselves and the system. They also emphasized that prayers still work wonders in addressing one's life problems. And matched with discipline and some people or organizations who are willing to sincerely assists them, they ardently believe that they could still find a way to become more productive citizens by alleviating their current poverty status.

However, there are still people who remain pessimistic on their current standard of living, as they said that they will die in that way – poor – and they will just let their children believe and work harder. This somehow proves the study of Najman, et al (2009) that some poor people are indeed manifesting a sense of hopelessness. Fortunately for these Filipinos under study, majority are still nurturing a sense of optimism.

Number of Family Members

The results gathered for this part are in-line with the data that are to be found on the local and national census. The Filipino respondents' respective family profiles are within the matrix of having five (5) to seven (7) family members, with two (2) or three (3) children per family.

This, according to them, clogs their family budget and convenience since they have more mouths to feed. It would have been better if their extended families are helping, unfortunately, they are not. Those who have 5-7 members stated that they only have two (2) children, but one or both have already married, and unfortunately, could not find stable jobs to support their young families, so they cling to the parents for more support.

More so, another pertinent reason is that quite a number of these respondents, despite only having one or two children, only have meager income. So notwithstanding such small family number, their income cannot conveniently sustain a certain degree of financial comfort.

Number of Family Members	
Base: Number of Respondents	**Percentage**
2 - 4 members	39
5 - 7 members	**42**
more than 7 members	19

Objective Two: Social Marketing Program

The social marketing program that targeted respondents who have vice was conducted using the conventional one-on-one marketing strategy. That is, the researcher and the assistants gave a program attached to the questionnaire, and explained how they could achieve their desire to somehow limit their vices and use their saved money for more important priorities. Just as what Carr (2008) and Sahoo (2001) studied, social marketing could serve as an integral part of poverty alleviation. The paradigm has worked abroad, so it could also have a possibility of success locally.

The concept may seem trivial and simple – with the projected savings to be small – but the bottomline remains that even the smallest cent could start a greater mindset and ignite the passion to become more disciplined in life to alleviate one's standard of living. Indeed, discipline is already inoculated in many poverty management programs such as microfinance and micro enterprise. But these programs come in the form of penal policies, such that only disciplined recipients – most likely the women, as in the case of some well-known micro enterprise institutions – could benefit.

This is the gray area that this research attempted to fill out, for this study will not use discipline as policy, but as a "marketable" initiative to help people, and social marketing has the capability to provide a "social advertising" jumpstart for this.

Going further, the respondents who have vices and are willing to give the program a try were given the program. Each cluster, as explained on Chapter 3, were given periods of time to implement the schemes, which were as follows:

1. Cluster 1 – one month
2. Cluster 2 – two months

3. Cluster 3 – three months
4. Cluster 4 – four months
5. Cluster 5 – five months

The clusters that underwent a specific period of exposure were randomly determined by the researcher. In between, they were visited to ask for their progress, until the final results were gathered after the given periods of time.

Significantly, the results of the program revealed that majority (65%) of the respondents have indeed controlled their vices, and statistically, changes are evident in terms of the following:

1. They were able to save a little more money to allocate for more important priorities such as food and medicine. Some were even planning to accumulate more savings to be deposited on banks.
2. Parallel studies to health and wellness were manifested, as some respondents stated that they feel better physically. For instance, one chain smoker proclaimed that due to his control of his vices, he could now feel more energy to work, more so, he said that he became more optimistic in his mindset and outlook.
3.

4. Vice Control	
5. Base: Number of Respondents with Vices	
6. Able to control	7. Not able to control
8. 65%	9. 35%

Objective Three: Social Marketing Program Effectiveness

In detail, the respondents who have changed their filthy habits are scattered across the five-tier social marketing program. That is, it simply means that there is progress from each period covered. This evidently shows the potential of the program. The summary from each period covered are as follows:

1. The respondents who were under the one-month period had a success rate of 70%
2. Majority (55%) of the respondents who were under the two-month program also showed progress
3. Less than 10% respondents who were exposed to the three-month social marketing scheme failed to control his vice.
4. The four-month program was able to kindle positive changes on over 50% respondents.
5. Nearly half of the people under the longest scheme – five (5) months, per se – still have shown potential to control their respective vices despite the relatively longer period of time.

Other significant results are as follows:

1. The entrepreneurial poor respondents were the more consistent for both countries under study, with nearly three-fourths (72%) of the total entrepreneurial poor indicating that they have experienced a certain degree of improvement. The laboring poor and employed got modest results, with 50% and 55% improvement rates, respectively.
2. This may be attributed to the fact that the entrepreneurial poor, being engaged in enterprises per se, know more about the value of money and working hard for it. Unlike the other two median urban poverty classes (laboring and employed), entrepreneurs, whether informal or not, across every classification, are the ones who are utterly in charge of everything that concerns about their business. Thus, they know how to practically earn – the hard way, per se.

3. In contrast to number 1, the other median urban poverty types, for instance the employed poor, every 15th and 30th money would be deposited onto their accounts, no matter how meager; and the laboring poor, who just needs to report for their respective daily jobs in order to earn and avoid the "no work, no pay" policy. Either way, these sub-classes would earn; one way or the other, as long they comply with their employers' policies. Their entrepreneurial counterparts, no matter how long their respective businesses operate, if there would be no customer to visit, would never earn.

Taking a cue from the data above, it clearly means that, indeed, given the opportunity to progress and matched with the fact that tangible (financial) results could be expected by the respondents. They should just muster enough discipline to change. This is the sole prerequisite, and if they could just exhibit even a little of such, the potential to progress could be nurtured.

Conclusion And Recommendations

In general, this study provided a new method to address the ever-perennial issue of poverty. Based on the respondents' immediate responses, it could be concluded that inoculating Social Marketing as an intervention to poverty management is indeed feasible. The Philippine milieu manifested, through its respondents, a promising set of results, as they stated that they still believe that with proper discipline, mindset and intervention, their standard of living will be improved. It was also validated by their exposure to the program, wherein majority of them showed potential for sustainable improvement.

Since this is a pilot study, despite the depth of research that it covered, there are still critical concerns that need to be covered by future research. Further studies on the following criteria should be conducted in order to fully reinforce the potential of this scheme:

1. A study that has a bigger scope of respondents.

   Perhaps, a future research could target, given resources, a wider scope of sample groups, with more diversified profiles. Doing this would further strengthen the purpose of this research, and will further attest that Social Marketing indeed has a future as a poverty intervention.
2. A study on both the rural and urban poor.

   Regardless of country to be studied in the future, both poverty classifications according to its geographic profile should also be given focus. This is attributed to the fact that rural and urban poor may have different lifestyles and attitudes.

3. A research that will target the four fundamental types of poverty.

   This study targeted the laboring poor under the median poverty classification. Future studies could scope more than one – or preferably all – poverty types, so as to make a detailed comparison of the respective profiles.

4. Comparison of all the existing poverty management initiatives with social marketing.

   Poverty can be managed through a multi-faceted approach. For one, there is micro finance and micro enterprising, then there is social enterprising, among others. Another study could present the parallel benefits and correlations among some of these existing multi-pronged approaches.

5. Comparison of existing foreign social marketing efforts, and selection of the ideal program that would suit best for the Philippine environment.

Benchmarking other foreign practices, which could go beyond the confines of the ASEAN consortium could present a very detailed follow up research. Surely, as what the related literatures suggested, there are quite a number of existing Social Marketing practices to intervene against poverty existing and being practiced from other nations. If these could be analyzed in a more in-depth manner, then it could further reinforce the value of Social Marketing in addressing poverty.

Acknowledgment

The proponent expresses his utmost gratitude to the Supreme Being for giving him the wisdom and the commitment to use his resources, skills and time to help the society in becoming a better place in his own small ways. God is always great and for all of it, in His glory.

More so, kudos to his family, friends and colleagues (too many to mention) for the all-out support.

Lastly. This is dedicated to the proponent's mother and grandfather who passed away due to Covid-19 last August and September.

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The Impact of Knowledge and Perception on Environmental Stimulus and its Effect on Young Generations' Attitude towards Green Products

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Abstract - It is vital to remember that public acceptance of pro-environmental behavior, as evidenced by the adoption of a sustainable lifestyle, is a critical issue in the fight to protect the environment. The purpose of this paper is to assess the young consumers knowledge and perception on green brand; examine their environmental attitudes and evaluate how these factors can affect their green product purchase intention. The result revealed that consumer knowledge and attitudes towards environment influenced their views on green products. It also demonstrated a strong link between green product perception and purchasing behavior.

Keywords - green products, consumer behaviour, green purchase intention

Introduction

Economic and social progress over the previous century has been accompanied by environmental degradation, threatening the very systems that underpin our future development (United Nation, n.a.). This situation reveals the increasing need to promote environmental awareness. It is important to note in this context that public acceptance of pro-environmental conduct, as demonstrated by the adoption of a sustainable lifestyle, is a significant issue in the effort to safeguard the environment. Purchasing green products for everyday use is considered an effective technique for addressing environmental challenges (Yue et al., 2020). A "green product" is one that incorporates recycling practices. It can be done by designing items that are made from recycled or recyclable resources and/or using less hazardous materials to help the environment (Shamsi & Siddiqui, 2017). Efficient green product development was crucial to the green marketing strategy. It has the potential to hasten the transition to a more sustainable environment for businesses and economies (Yan & Yazdanifard, 2014).

Consumer behaviour toward the environment has become a major concern on a global scale; it is manifested in all aspects, from energy conservation efforts to shifts in consumption patterns toward environmentally friendly products (Alamsyah et al., 2018). Knowledge is one of the most important variables influencing consumer purchase decisions, and various marketing approaches have the ability to distribute awareness of green products (Wang et al., 2019). "Green purchase intention" refers to consumer prediction towards the selection of environmentally friendly products (Othman & Rahman, 2014). According to White et al, (2019) in their article for the Harvard Business Review, consumers, particularly millennials, are increasingly expressing a desire for firms that are committed to social good and sustainability. On the contrary, the literature available on this area is insufficient, particularly from the Philippine perspective. Therefore, it is essential to learn more about the consumer's perspective on environmental issues and how they act, particularly when it comes to purchasing green or environmentally friendly products.

This paper aims to explore knowledge, perceptions, and attitudes towards the environment and green products and compare them to the demographics of young consumers. The study also explored the correlation between consumer knowledge, perception, and attitudes towards green purchasing. Various sectors of our economy will benefit from this research. It will assist businesses in developing marketing strategies by exhibiting the benefits of green product quality, both for consumers and for the environment. The findings of the study can potentially be used by the government in developing environmental policies.

Conceptual Framework

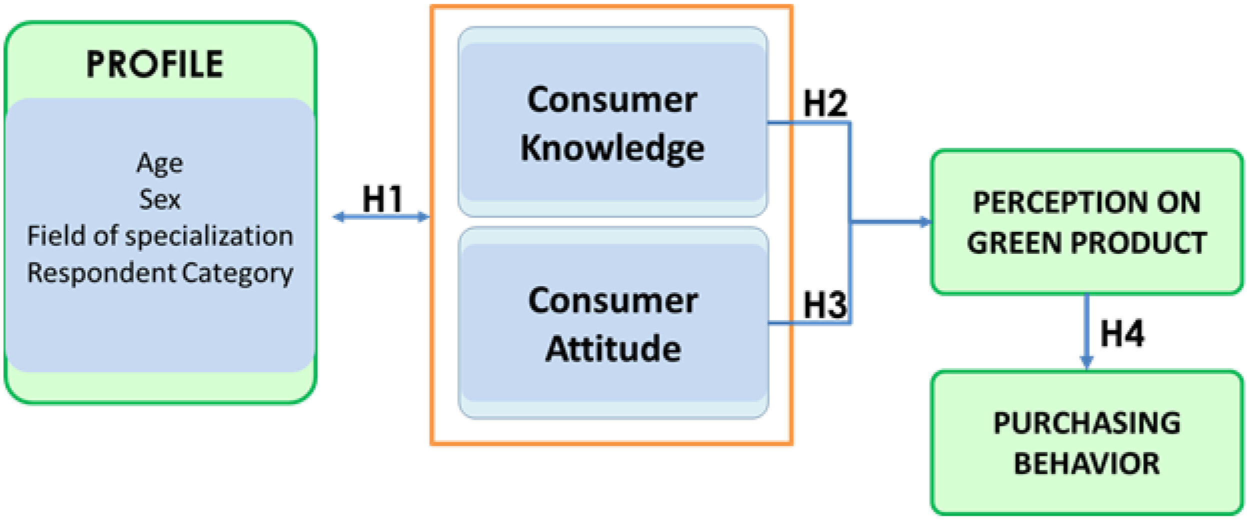

Figure 1. Knowledge, Attitude and Perception towards Green Products Framework

The study's framework outlines the variables that were utilized to analyze the green product purchasing behavior of the participants. Initially, the participants' profiles are established in terms of their age, sex, specialization, and work status. The participants' knowledge, perceptions, and attitudes toward environmentally friendly products were examined and analyzed to determine whether the aforementioned criteria are associated with their purchase behavior.

Methodology

Research Design

The study utilized a correlation- descriptive research design. Correlational analysis is used to determine whether two variables are correlated. This entails determining whether an increase or decrease in one variable is associated with an increase or decrease in another. It is important to realize that correlation does not imply causation. It is employed to determine the influence of the consumer knowledge and attitude on green products as well as their environmental attitudes as potential factors that affect the consumers green products buying behaviour.

Population and Samples

The study was conducted among millennials and generation Z in Cavite. Non-probability quota sampling technique was employed in determining the participants of the study. Non-proportional quota sampling is a technique that imposes a small sample size restriction on each category (Frey, 2018). It is not concerned with obtaining a figure that corresponds to the population's proportions.

In this study, participants and locations are selected nonrandomly according to a fixed quota or percentage of the population based on one or more characteristics. Primary data collection is accomplished through the distribution of questionnaires via face-to-face and online surveys.

Research Instruments and Data analysis

The study used a three-section structured survey questionnaire. The first section aims at gathering basic information about the respondents, while the second and third sections contain 96 items on a 5-point Likert scale that assess respondents' knowledge and perception of environmental stimuli and their effect on younger generations' attitudes toward green products. The researchers conducted a pre-test survey on 30 sample participants to ascertain the consistency of the items included in the questionnaires for quantitative data analysis. The analysis employed statistical techniques such as frequency and percentage distributions, arithmetic mean, weighted mean. The impact analysis was conducted using correlation and simple linear regression.

Results and Discussions

After conducting the online data collection, the following tables were generated to summarize the major constructs in assessing the knowledge and perception of green products and environmental attitudes of the younger generations as potential factors affecting their green purchasing behaviour.

Profile. A total of 318 respondents participated in the study. In terms of age, half of the respondents were aged 18 to 20 years old, while the majority were female. In terms of their field of specialization, 77.99 percent were in the business field and 72.96 percent were students.

Table 1. Profile of the respondents

PROFILE	FREQUENCY	PERCENTAGE
Age		
18 to 20 years old	161	50.63
21 to 23 years old	108	33.96
24 to 26 years old	35	11.01
27 to 30 years old	5	1.57
No response	9	2.83
Sex		
Male	116	36.48
Female	202	63.52
Field of Specialization		
Business Major	248	77.99
Non-Business major	70	22.01
Respondent Category		
Working Sector	86	27.04
Student	232	72.96

Consumer Knowledge. The knowledge of the consumers was assessed in terms of their understanding of environmental issues, their consumer responsibility that is related to environmental conservation, as well as their familiarity with the green scheme or green products and marketing. The result shows that the participants have moderate knowledge of the identified factors, with the highest rating on consumer responsibility. They are aware that humans interfere with nature, which often has disastrous consequences, and they consider the idea that people must live in harmony with nature in order to survive.

Table 2. Respondents' consumer knowledge assessment

CONSUMER KNOWLEDGE	WEIGHTED MEAN	STANDARD DEVIATION	VERBAL INTERPRETATION
Environmental Issues	3.96	1.1446	moderate extent
Consumer responsibility	4.06	1.1827	moderate extent
Green scheme	3.87	1.2459	moderate extent
GRAND MEAN	**3.96**	**1.1911**	**moderate extent**

Consumer attitude. The assessment considered the cognitive beliefs, affective and conative dimensions of consumer attitude. The result shows that the participants' positive attitudes towards the environment are reflected to a moderate extent when purchasing products.

In terms of their beliefs, they highly considered the importance of raising environmental concerns among citizens and protecting the environment, with a weighted mean of 3.44 (SD = 3.944). In terms of their emotional affinity for nature, the participants indicated that they have pleasant feelings and positive attitudes towards spending time in the environment, with a weighted mean of 4.04 (SD-1.8036). On the cognitive factors, the study assesses both the previous buying attitude and the future intentions of the participants in contributing to the environment.

The participants indicated that they somehow agreed on taking their own bags when buying in the supermarkets. They also support retailers who are environmentally responsible and use the recycling center to recycle their household trash with a weighted average of 4.12 (SD = 2.7222). Moreover, the participants agreed that they are willing to buy products in a farmer's market and that they are striving to learn more about environmental issues and to be able to avoid buying products from companies that are ecologically irresponsible in selling their products, with a weighted average of 3.96 (SD = 2.1845).

Table 3. Respondents' consumer attitude assessment

CONSUMER ATTITUDES	WEIGHTED MEAN	STANDARD DEVIATION	VERBAL INTERPRETATION
Cognitive Beliefs	3.44	3.9444	moderate extent
Affective factors	4.04	1.8036	moderate extent
Conative factors (environment related buying attitudes)	4.12	2.7222	moderate extent
Conative factors Intention towards the environment	3.96	2.1845	moderate extent
GRAND MEAN	**3.89**	**2.8740**	**moderate extent**

Consumer Perception nn Green Products. The study also assesses participants' perceptions of green products, taking into account their moderate level of knowledge and attitude toward environmental issues and green-related business.

The result indicates that participants have a favorable attitude toward green products, with a computed weighted average of 4.02. The highest rating was given to the notion that green products are environmentally friendly. On the contrary, participants have the lowest rating for market promotion of green products.

Table 4. Assessment on consumer perception on green products

CONSUMER PERCEPTION ON GREEN PRODUCTS	WEIGHTED MEAN	STANDARD DEVIATION	VERBAL INTERPRETATION
Green products are healthy	4.19	1.2240	moderate extent
Green products are good for the environment	4.21	1.1561	high extent
Green products are of good quality	4.16	1.2000	moderate extent
Green products are better than standard products	4.04	1.1559	moderate extent

Green products are reasonably priced	4.02	1.2149	moderate extent
Green products are easily accessible in stores	3.95	1.1984	moderate extent
Green products are well promoted	3.89	1.2988	moderate extent
The price of green products affects my purchasing decision	3.98	1.1590	moderate extent
Green products provide awareness to consumer	4.09	1.1956	moderate extent
Green products are attractive	4.14	1.1789	moderate extent
GRAND MEAN	**4.02**	**1.2178**	**moderate extent**

Green Product Purchasing Behavior. The participants sometimes tend to purchase green products with a weighted mean of 4.09 (SD 4.1413). They often bought eco-friendly products that they believe can contribute to improving the quality of life in our society and the environment, and they preferred to purchase these eco-friendly items when buying non-food products with a weighted mean of 4.21 (SD=3.1701) and 4.22 (SD=3.3862) respectively.

Table 5. Assessment on consumer perception on green products

GREEN PRODUCT PURCHASING BEHAVIOR	WEIGHTED MEAN	STANDARD DEVIATION	VERBAL INTERPRETATION
I have switched products for ecological reasons	3.98	2.4204	Sometimes
I have purchased a household appliance because it used less electricity than other brands	3.97	2.5736	Sometimes
I have purchased light bulbs that were expensive but save energy	3.97	2.6809	Sometimes
I already use biodegradable products	4.05	2.7155	Sometimes
I already avoid buying aerosol products.	3.96	2.7747	Sometimes
I read labels to see if contents are environmentally safe before buying products	4.01	2.8318	Sometimes
I bought products made or packaged in recycled materials	4.12	2.8595	Sometimes
I bought products in packages that can be refilled.	4.14	2.9191	Sometimes
It is important to me that the products I use do not harm the environment	4.16	3.0208	Sometimes
I realize that purchasing an environmentally friendly product can help the society	4.16	3.1472	Sometimes
By buying eco-friendly product, I contribute to improving the quality of life of our society and the environment	4.21	3.1701	Often
I am satisfied in buying green product	4.19	3.2734	Sometimes
I prefer organic food over traditional food when buying food products	4.13	3.3445	Sometimes
I prefer eco-friendly products when buying non-food products	4.22	3.3862	Often
I normally make a conscious effort to limit my use of products that are made of or use scarce resources	4.10	3.5039	Sometimes
When there is a choice, I always choose the product that contributes to the least amount of pollution	4.18	3.5405	Sometimes
If I understand the potential damage to the environment that some product can cause, I do not purchase those products	4.17	3.6015	Sometimes
I make every effort to buy paper products made from recycled paper.	4.07	3.7830	Sometimes
I do not buy products in aerosol containers.	3.95	3.8428	Sometimes
Whenever possible, I buy products packaged in reusable containers.	4.14	3.8672	Sometimes
I buy toilet paper made from recycled paper.	4.09	3.9396	Sometimes
I try only to buy products that can be recycled	4.09	3.9917	Sometimes

GREEN PRODUCT PURCHASING BEHAVIOR	WEIGHTED MEAN	STANDARD DEVIATION	VERBAL INTERPRETATION
I do not buy household products that harm the environment	4.10	4.0494	Sometimes
I try to buy energy efficient household appliances.	4.05	4.1595	Sometimes
I consume foods that are produced using organic farming methods	4.09	4.3648	Sometimes
I take printed copy of my bank statement only if needed to submit for official purpose	4.10	4.4148	Sometimes
I prefer to use e-vehicles than gas-powered car	4.13	4.5814	Sometimes
GRAND MEAN	**4.09**	**4.1413**	**Sometimes**

Association of Consumer Knowledge and Attitude on their perception on green products

Consumer Knowledge and Perception. The correlation analysis between variables using non-parametric tests shows that there is a moderate positive correlation between consumer knowledge and perception towards green products.

The green scheme, which constitutes green marketing and promotion of organic products, was observed to have the highest correlation coefficient among the indicators indicated in the study, which indicates it has a greater influence on consumers' perspective on green products. On the other hand, consumer responsibility and environmental issues were also observed to have a moderate positive correlation with their perception.

Table 6. Correlation analysis between consumer knowledge and perception on green products

VARIABLES	CORRELATION COEFFICIENT	P-VALUE	VERBAL INTERPRETATION
Environmental Issues	0.5880	0.000	moderate positive correlation
Consumer responsibility	0.6330	0.000	moderate positive correlation
Green scheme	0.6460	0.000	moderate positive correlation
CONSUMER KNOWLEDGE	**0.6520**	**0.000**	**moderate positive correlation**

Consumer Attitude and Perception The result showed that consumer attitude has a strong positive correlation with the consumer's perspective on green products, with a coefficient of 0.7290 (P 0.01). In assessing the components, consumer environmental related behavior was observed to have a strong positive influence on their perspective on green products. On the other hand, their cognitive beliefs about their contribution as a consumer to the environment were observed to have weak influence.

Table 7. Correlation analysis between consumer attitudes and perception on green products

VARIABLES	CORRELATION COEFFICIENT	P-VALUE	VERBAL INTERPRETATION
Cognitive Beliefs	**0.4280**	**0.000**	**weak positive correlation**
Emotional affinity to nature	**0.6750**	**0.000**	**moderate positive correlation**
Consumer environment related behavior	**0.7000**	**0.000**	**strong positive correlation**
Behavioral Intention towards the environment	**0.6560**	**0.000**	**moderate positive correlation**
CONSUMERATTITUDES	**0.7290**	**0.000**	**strong positive correlation**

Effect of consumer perception on green products and their purchasing behavior

The assessment of the degree of relationship between consumer perception of green products and their purchasing behavior was observed to have a strong positive correlation with their purchasing behavior.

Table 7. Correlation analysis between consumer perception on green products and their purchasing behavior

VARIABLES	CORRELATION COEFFICIENT	P-VALUE	VERBAL INTERPRETATION
Consumer Perception	0.714	.000	**strong positive correlation**

The values for the regression equation for predicting the dependent variable from the independent variable is illustrated in table 8. The model estimates that for every one-point increase in the rating of consumer perception on green products may have an estimated increase of 0.685 units in consumer purchasing behavior for green products. The model is highly significant with adjusted r-squared of 0.649, which means the 64.9 percent of the variation in the green product purchasing behavior can be associated with the changing perception on green products.

Table 8. Impact analysis of consumer perception on green products on purchasing behaviour

Variables	Coefficient	t-statistics	p-value
(Constant)	1.111	9.052	.0000
perception	.685	23.369	.0000
Adjusted R Square		.649	
F-statistics		546.116	
Prob (F-statitics)		.000[b]	

a. Dependent Variable: GREENPRODUCTPURCHASINGBEHAVIOR (GPPB)
b. Predictors: (Constant), CONSUMERPERCEPTIONONGREENPRODUCTS (CPGP)
MODEL: *GPPB = 1.111 + 0,685CPGP*

Conclusion and Recommendations

In terms of the knowledge and attitude of the participants towards the environment, the participants rated all the factors to a moderate extent, indicating that the younger generation requires additional exposure to environmental concerns and issues. Their perception of green products was also evidently lacking, particularly in terms of the promotion of green products to the environment. On the contrary, participants, particularly those purchasing non-food items, prevalently prefer eco-friendly options.

Furthermore, consumer knowledge and attitudes towards nature were found to have a positive influence on their perspective on green products. It also revealed that their perception of green products had a strong correlation with their purchasing behavior. The potential favorable impact of a positive perception of green products on purchasing behavior was also revealed in the model. The study recommends further research on the long-term impact of other environmental stimuli on green product purchasing behavior, as well as taking steps to increase community green product awareness in order to improve their knowledge and attitude towards more sustainable growth.

Acknowledgement

The authors are extremely thankful for the Asia-Pacific Consortium of Researchers and Educators (APCoRE) in spearheading this year's conference where great minds meet and best researches are shared including this study which has gone a thorough review for it to be shortlisted for the Best Paper Award. Furthermore, the authors are grateful for the support of Cavite State University officials and Imus Campus administration as they embark on another international engagement with fellow researchers and educators across countries and regions.

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The Perceived Challenges Faced by Selected Microenterprises amidst Covid -19 Pandemic

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Abstract - The outbreak of coronavirus disease (COVID-19) has severely affected the global society and the economy. One of the major victims of the pandemic is microenterprises (MEs). This study aims to explore the perceived challenges faced by selected microenterprises during the implementation of enhanced community quarantine between March 17 to May 15, 2020 due to COVID-19 pandemic. The study utilized a descriptive research design. The participants were chosen through purposive sampling technique and self-made semi-structured interview guide was used from prospective participants. Findings of the qualitative study revealed that there were three (3) themes that were culled from participants on the perceived challenges faced by microenterprises. These include shortened hours of operation, supply chain disruption, and long queues of customers. The major contribution of the current study is to further add knowledge regarding the challenges faced by microenterprises amidst the pandemic. The findings highlight the need for businesses to maintain close coordination with suppliers in order to ensure the on-time delivery of products, provide quality services and increase profitability. The study is significant to enterprise owners on how to mitigate business losses and survive during these challenging times. The study is also significant to policy makers in creating capacity-building programs particularly focused on the further improvement and sustainability of microenterprises in the Philippines amidst pandemic.

Keywords - shortened hours of operation, supply chain disruption, long queues of customers, enhanced community quarantine (ECQ) and Covid-19.

Introduction

A strong enterprise sector contributes highly in the Philippine economy. The role of microenterprises in the country is significant as they have the ability to make meaningful contributions in the level of employment, trade, innovation and inclusive growth. Microenterprise is defined as a productive business owned by an individual or an individual business and hires a few numbers of employees (Bella, 2020). These enterprises are categorized by asset size: micro: up to Php3,000,000; and employs, 1-9 employees (Legaspi, 2012, Cheeroli and Kumar, 2018).

Based on the data provided by the Philippine Institute of Development Studies (2012) 65 percent of workers are employed under micro, small and medium enterprises while 35 percent are employed under large enterprises making them critical indicators of economic growth and development. Additionally, the government-initiated assistance programs for its sustainable development in the country (Hidaldo, Marquez, Sarmenta, Alvarez, Ong & Balaria, 2021). Thus, these businesses are considered as an essential component in addressing poverty reductions issues and promotion of entrepreneurial activity (Sitharam, 2014).

Notably, microenterprises in the Philippines are composed of 91.9%, while small and medium enterprises making up to 7.8% and 0.33% large enterprises (Parilla, 2011). Considering the growth of these businesses in the country, Republic Act No. 9178, Barangay Micro Enterprises Act of 2002 was enacted by encouraging the continuous formation of enterprises in the rural and urban area. Due to their large numbers, they are considered as the “silent transformers” of economies around the world (Munoz, 2010).

Thus, they create jobs, and helps increase the availability of products and services to customers, suppliers and producers in the country and overseas. However, despite their dominant contributions in the country, these enterprises are highly sensitive to environmental forces such as natural calamities, natural disasters and pandemic. The occurrence of such adversities has a negative effect on businesses in the economy.

Last December 2019 the country has been shocked by a new virus called COVID-19 that appeared in Wuhan, China. According to the World Health Organization (WHO, 2020) the unexpected spread of COVID-19 around the world has brought significant impact and is considered a top global economic risk. Coronavirus is a group of viruses that can cause disease in humans according to the World Health Organization (Bella, 2020). Nicomedes and Avila (2020) posited that COVID19 is a person-to-person transmission. In another study, Hidalgo, Marquez, Sarmenta, Alvarez, Ong and Balaria (2021) mentioned that COVID-19 is an infectious disease-causing global health crisis. As the virus spread in the country and around the globe the World Health Organization declared that the virus is pandemic.

Thus, economic managers in the Philippines, have issued a more policy initiatives and economic assessment as the pandemic hits the country. With the vast number of people being affected in just a short period of time President Rodrigo Roa Duterte declared the National Capital Region (NCR) and selected provinces under the enhanced community quarantine (ECQ) for two (2) months from March 17 to May 15, 2020. Enhanced community quarantine or ECQ is defined as an astringent quarantine measure (IATF, 2020). Due to the pandemic, business continuity is the most discussed topic of all organizations regardless of the size and nature of businesses (DTI, 2021). The government ordered that only essential businesses are allowed to operate such as public and private hospitals, grocery, supermarkets, convenience stores, banks and drug stores (IATF-EID, 2020).

With the declaration of the enhanced community quarantine due to COVID-19 pandemic, one of the sectors that was being affected are microenterprises. To continue their operation, microenterprise owners implemented policies, procedures and safety protocols in accordance with the directives of the Inter Agency Task force for the Management of Emerging Infectious Disease (IATF-EID, 2020). They required their customers to wear face masks, face shields and follow social distancing. On the other hand, workers in the store are required to wear face mask and face shield for their safety while assisting customers.

In other countries, layoffs, financial difficulties and closures have already occurred (Bartik, Bertrand, Cullen, Glaeser, Luca & Stanton, 2020). Forty three percent (43%) of small businesses in the United States were temporarily closed and employment has declined to 40 percent (Bartik, Bertrand, Cullen, Glaeser, Luca & Stanton, 2020). The results reported that some of the identified challenges faced by these businesses include less capital, wherein they have to dramatically cut expenses, bankruptcy and take on additional debt. In another study, KPMG (2020) mentioned that 94 percent of businesses listed by Fortune 1000 are affected by COVID-19. In times of crisis some of the challenges encountered by microenterprises include the lack of capital, limited resources and skilled manpower (Arun, 2015). Cheeroli and Kumar (2018) mentioned that during economic emergency microenterprises faced a number of problems such as lack of opportunities to use latest technology and lack of managerial experience. Moreover, long queues inside and outside stores has been observed with hours-long waiting lines led to emergency purchasing situations (Pantano, Pizzi, Scarpi & Dennis, 2020).

Since there have been limited number of studies on microenterprises in the context of pandemic in the Philippines, the researcher would like to further add knowledge regarding the challenges faced by microenterprises and to give more attention to the adversities encountered during the implementation of the enhanced community quarantine (ECQ) between March 17 to May 15, 2020.

Methodology

The participants include selected microenterprises located in Metro Manila and province of Laguna and has been operating for more than ten (10) years. These businesses were deemed essential and thus remained open throughout the enhance enhanced quarantine (ECQ) between March to May 2020. The target participants include microenterprise owners and workers. Purposive sampling technique was used in selecting participants in order to gain good qualitative data (Polit & Beck, 2012).

The qualitative sampling purposefully selects participants who can best help one understands the central phenomenon that the researcher needs to explore (Creswell, 2015).

Following the inclusion criteria for selecting respondent were as follows:
1. he/ she must be part of the microenterprise.
2. the business has been operating for more than 10 years.
3. and voluntarily participate in the study.

Due to the implementation of safety protocols in the country, the availability and gathering of responses was crucial during the pandemic crisis. The instrument utilized was a self-made semi-structured interview guide underwent a thorough validation by two faculty members in the business cluster of the UST-AMV College of Accountancy for it to become suitable for the current study. The survey consisted of three (3) short questions which include:

1. What is the demographic profile of the selected microenterprises in terms of?
   a. start-up capital
   b. years of operation
   c. type of business
   d. number of workers

2. What are the challenges faced by selected microenterprise brought about by COVID-19 during the implementation of the ECQ between March 17 to May 15, 2020?

3. Does the sales performance of the store decline during the ECQ between March 17 to May 15, 2020 due to COVID-19 pandemic?

The responses of the participants were designated as R1 or respondent one, to R14 respectively for microenterprise workers and M1 and M2 for microenterprise owners. The responses of the participants were subjected to thematic content. The data were analyzed, coded to form themes (Creswell, 2014). Thematic saturation was sought when no new themes or information on the topic were obtained.

Results and Discussions

1: What is the demographic profile of these microenterprises?

Microenterprise 1 started in 1990 with a capitalization of Php70,000. The business has been operating for 30 years, and has employed seven (5) employees. The business is registered as sole proprietorship and has been engaged in wholesaling and retailing of grocery items.

On the other hand, microenterprise 2 has been operating for 11 years. This business is also engaged in wholesale and retail of goods catering to households and resellers in the area. The store has nine (9) employees and started with a capitalization of Php 80,000.00.

Out of 14 microenterprise workers, there were five (5) females and nine (9) males. The participants age bracket is between 21-30 years' old which represents 62.50% (N=10) of the total population. With regard to their civil status, most of the microenterprise workers were single 85.71% (N=12). Furthermore, these participants were willing and able to take part by sharing their knowledge and expertise during the interview. Table 2 shows the demographic profile of the participants.

Table 1 Demographic Profile of Selected Microenterprises

Items	Microenterprise 1	Microenterprise 2
Start-up capital	100,000	80,000
Years of operation	30	11
Line of business	grocery	Grocery

Table 2. Demographic Profile of Microenterprise owner

Item		
Gender	Subtotal	%
Male	1	50
Female	1	50
Total	2	100
Age		
41 – 50	1	50
61 – 75	1	50
Total	2	100
Civil Status		
Married	2	100
Total	2	100

Table 3. Demographic Profile of Workers

Item		
Gender	Subtotal	%
Male	9	64.28
Female	5	37.71
Total	14	100
Age		
21 – 30	10	62.50
31 – 40	1	6.25
41 – 50	1	6.25
51 – 60	1	6.25
61 – 75	1	6.25
Total	14	100
Civil Status		
Single	12	85.71
Married	2	14.28
Total	14	100

2. What are the challenges faced by these microenterprises brought about by COVID-19 during the implementation of the ECQ in Metro Manila?

Three themes were generated:

First: shortened hours of operation

Operating hours is one of the most essential determinants of productivity and competitiveness to business establishments. It is defined as the number of hours a business operate in a week. Operating hours also served as the working time of employees and utilization of capital (Delsen, Bauer, Cette & Smith, 2009).

In other countries operating hours depend on the size of the business enterprise and the shift of working personnel widens business operations (Delsen, Bauer, Cette & Smith, 2009). In the Netherlands, big supermarkets operate on an average of 59 hours in a week (Delsen, 1999). When a particular business extends operating hours, this can cater more customers, productivity increases along with sales and profit. Cummings (2020) explained the effects of the COVID-19 pandemic on workers reporting hours and small businesses in the U.S. When the pandemic-related economic lockdowns were taking effect, around 60% of small business operating hours plummeted in March of 2020.

Prior to the pandemic, in the Philippines these businesses operate from 6:30am, to 8:30pm (twelve (12) hours a day). However, during the implementation of the ECQ and curfew by the Metro Manila Development Authority (MMDA), stores can only operate from 6:30am to 3:00pm making it seven (7) hours a day.

A distinct and interesting set of themes emerged:

"Nagbago po yung operating hours naming sa tindahan" (R1, R2)
(we change our operating hours in the store)
"Nag-operate po kami from 6:30am hanggang 3:00PM dati po from 6:30am-8:00 PM" (MI, M2 R4, R5)
(The store operates from 6:30am to 3:00pm, but before we can operate from 6:30am to 8:00PM)
"Unexpected po yung pagbago ng operating hours" (R6)
(The change in operating hours is unexpected)
"Mas naging maikli po ang operating hours namin ngayun dahil sa lockdown" (R7-R14).
(our operating hours has been shortened due to lockdown)

The said findings are consistent with the study of Cummings (2020) that business operations have been affected due to the pandemic. Additionally, operating hours serve as the utilization of capital and working time of employees (Delsen, Bauer, Cette & Smith, 2009).

Second: Supply chain disruption

In every organization the advent of natural disasters, pandemic and economic crisis greatly hurts the supply chain operation. Due to border controls, the pandemic disrupts the supply chain operations in the country (Lope de Sousa Jabbour et al 2020). Thus, the COVID 19 outbreak destroys the whole supply chain activities by making restrictions in land, air, sea transportation facilities, and border closure. The outbreak has also affected the availability of raw material supply, and entire shutdown of manufacturing activities (Paul and Chowdhury 2020; Chowdhury et al. 2020; Paul and Chowdhury 2020b; Rowan and Galanakis 2020.

According to David (2002 as mentioned by Samuel, 2010), when there is efficient supply of inventory, it prevents against stock outs. Availability of supply is an essential component of every organization and it requires vital entrepreneurial consideration. When there is an optimal number of inventories and organized distribution system, the business continues to operate. Thus, this creates a strong relationship between the supplier, seller and customer.

Maintaining an adequate stock of essential items (basic goods) enables the company to meet the market demand while minimizing holding costs (Samuel, 2010). In western Kenya, a study on inventory management showed that supermarkets should automate their inventory management systems to improve customer service and reduce operational costs (Samuel, 2010). In Taiwan a study on grocery stores mentioned that retailer-supplier relationship improves supply chain competitiveness (Tyan, 2003).
In practice, microenterprise 1 and 2 conducts manual inventory and checking of shelf-space availability every weekend. These enterprises have a fixed delivery schedule with suppliers to deliver "just in time" of essential items such as rice, bread, canned goods, candies, soap, and shampoo. Because of the

implementation of the enhance community quarantine due to COVID-19 from March 15 to May 17, 2020 these enterprises have experienced supply chain disruption.

A distinct and interesting set of themes emerged:

“Nung nagka ECQ, limitado lang po supply ng mga paninda namin” (R1, R5
(during the ECQ we only have limited supply of essential items)
“Nagkukulang po ang supply naming dahil sa late delivery dahil sa ECQ” (R6, R10)
(we have less supply due to late delivery because of the ECQ)
“Availability of supply ng items po naming nagkululang” (R11, R14)
(we have limited supply of items)
“Marami po kaming supply bago mag-lock down” (M1)
(we have plenty of supply during lockdown)
“late ang delivery nung nagka ECQ”.(M1, M2)
(late delivery during ECQ)

The above findings are supported with the study of Bartik et al. (2020 as cited in Shafil, Liu and Ren, 2020) that due to limited resources they are more vulnerable to the environmental crisis. This is evident from the results mentioned by the participants.

Third: Long queues of customers

The COVID-19 pandemic has greatly changed consumers shopping experience, product needs and purchasing behaviors, including their post-purchase satisfaction experience. In China, there was a significant increase in the hoarding of food products (Brandtner, Darbanian, Falatouri & Odukwu 2021) leading to long waiting line if customers. According to Shumsky, Debo, Lebeaux, Nguyen, and Hoen (2020) to reduce the transmission of COVID-19, many retail stores use one-way aisles for safe shopping leading to the long queue of customers. Because of the limited operating hours, customers pile up leading to long queues because of health and safety protocols such as social distancing and limited number of work personnel. Customers often have to wait during the process of acquiring and consuming many products and services. These waiting experiences are typically negative and have been known to affect customers' satisfaction. To better manage these waiting experiences, microenterprise owners have instituted their sales personnel to act and move as fast as possible to reduce the actual duration of the wait in order to serve all the customers in queue before the curfew hours.

A distinct and interesting set of themes emerged:

“Ang haba po ng pila ng mga customers naming sa tindahan” (R1, R8)
(long queues of customer in the store)
“Inaabot po sila ng isang oras bago ma-entertain dahil po sa haba ng pila” (R9)
(it takes them one hour to be entertained due to long waiting line)
“Mahaba po ang pila sa tindahan dahil sa social distancing” (R10, R14)
(long queues in the store due to social distancing)

The above findings are consistent with the study of Pantano, Pizzi, Scarpi and Dennis (2020) that long queues inside and outside stores has been observed with long waiting lines led to emergency purchasing situations. This is also supported by the works of Shumsky, Debo, Lebeaux, Nguyen, and Hoen (2020) that many retail stores use one-way aisles for safe shopping and customers wait in line.

3. The third interview question, does the sales performance of the store declined during the ECQ? Majority of the microenterprise owners answered No.

According to the enterprise owners:

“Hindi po bumaba ang sales namin noong ECQ dahil sa CoVID-19, bagkus tumaas pa ito dahil sa panic buying” (M1, M2) (our sales did not decline during the ECQ due to COVID-19, but has greatly increased due to panic buying).

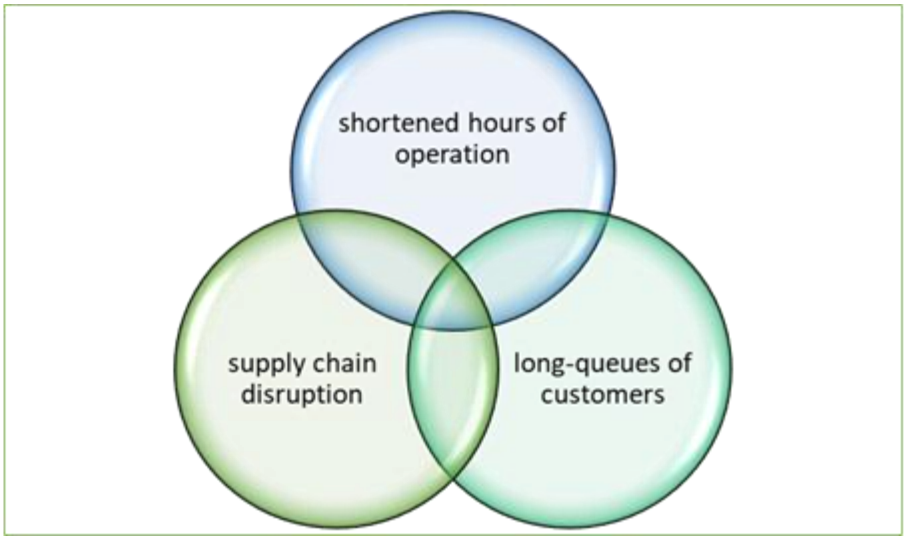

Figure 1. Conceptualized challenges faced by selected microenterprises amidst COVID-19 in Metro Manila.

The above figure illustrates the three (3) conceptualized challenges faced by microenterprises during the implementation of ECQ due to the pandemic. First, shortened hours of operation. Operating hours serve as the utilization of capital and working time of employees (Delsen, Bauer, Cette & Smith, 2009). Second, supply chain disruption. The availability of supply of essential items represents the number of products that sellers are willing to supply. An increase in inventory will lead to an increase in the availability of supply of goods and services (Baye, 2018). According to David and David (2002 as mentioned by Samuel, 2010), when there is an efficient supply of inventories it prevents against stock outs which makes an efficient supply of items. Third, long-queues of customers. According to Shumsky, Debo, Lebeaux, Nguyen, and Hoen (2020) to reduce the transmission of COVID-19, many retail stores use one-way aisles for safe shopping leading to the long pile of customers. To illustrate, the three (3) specific themes are interlocking indicating the challenges faced by these enterprises during the implementation of the ECQ between March 17 to May 15, 2020 amidst pandemic.

Summary of Findings, Conclusions and Recommendations

The virus outbreak greatly affects the economy especially microenterprises. Findings of the qualitative study revealed that there were three (3) themes that were culled from the participants on the challenges faced by microenterprises. These includes shortened hours of operation, supply chain disruption and long queues of customers. The findings of the study will serve as an avenue to microenterprise owners and workers to coordinate with their suppliers, maintain adequate stocks, and keep up to date during natural calamities, economic crisis or pandemic. The results highlight the need for businesses to maintain close coordination with their suppliers in order to ensure the on-time delivery of products, provide quality services and increase profitability. The study is also significant to microenterprise owners on how to mitigate business losses and survive during this challenging times. Moreover, the government should provide necessary interventions in mitigating the pandemics impact on microenterprises by providing access to finance and market, business development support, and promote sustainable value chain. This can result to an increase in inventory of essential items that would not lead to panic buying and escalation of prices. The researcher also recommend that enterprise owners can explore online selling and delivery in order to maintain the safety and security of their customers, and store personnel. Furthermore, the study may contribute to the body of literature by initiating empirical research to investigate the relevance of an inventory decision making model that could be utilized by microenterprises as a contingency plan in managing uncertain supply chains during pandemic or natural calamity.

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Work Immersion for College and Career Readiness of Accountancy, Business and Management Among Senior High School

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Abstract - This study aimed to determine the importance of the work immersion of senior high school students to be equipped with proper tools and attributes to enter college and/or employment regarding self-efficacy test which details the respondents' learning experiences and outcomes, college experiences, and college and career planning. The study used both qualitative and quantitative research designs. There were 174 respondents who enrolled in the College of Business and Accountancy in Liceo de Cagayan University with an approval by the dean. A modified survey questionnaire was the tool used for data gathering to identify the importance of work immersion program of the senior high school to their college and career. Results revealed that respondents are satisfied in improving the skills and abilities, being able to comprehend from the different situation they might be in, as well as their understanding about college and career and its importance. It is recommended that concerned educators should lead to realistic career opportunities, provide college and career exploration opportunities for students, and build workforce connections into the general education curriculum so that students can reflect on individual interests and abilities as they relate to content material and its connection to college and workforce needs.

Keywords - Work Immersion; Self-efficacy; Learning Experiences; College and Career Readiness; Learning Outcomes

Introduction

Readiness is one of the important tools in studies and in work. Being ready with school and work stuff would make a person equipped with the basic skills and attitudes to handle a lot of difficulties. The question is not the value of the work immersion experience for Senior High School (SHS) Accountancy, Business and Management (ABM) students, but the degree of readiness of students for intensive experiential learning. Therefore, students need to develop their career skills and college readiness in order for them to be able to handle problems whether in undergraduate studies and/or in the work set-up in K to 12.

According to Fleming (2018), today's workforce demands highly-skilled, knowledgeable, and adaptable personnel to meet the challenges of a rapidly changing economy and society. Therefore, schools need to shift focus from repetition of information and compliance, to enduring understandings, skills, and long-term transfer goals that will prepare students for on-going post-secondary learning and adaptability in meeting its demands of today's workforce. To do this, efforts of secondary education institutions must focus on developing the understanding skills of college and career readiness for students. College and Career Readiness (CCR) is defined as the ability of students to enter post-secondary institutions for learning, certificate programs, or the workforce no need for remediation in basic academics or skills related to the post-secondary pathway. In addition, students must develop and adapt behavioral aspects of students and employees' performance such as their time management, adaptability and interpersonal skill, as well as their persistence which are necessary for on-going growth and success at the post-secondary level (ACT, 2013; Conley, 2012; National Assessment Governing Board, 2009). Very likely, students are exiting high school not equipped with the necessary skills required of post-secondary education and the workforce (Alvarez, Gillies, & Bradsher, 2003). Inability to compete in the academic arena makes students unable to compete in the economic arena. Secondary career and technical education is finding itself at the forefront of these challenges and is emerging as an active stakeholder of high school reform efforts (Neumark, 2007) as well as the college and career readiness of the high school students. Most aspects of high school reform center on the critical role, education must play in influencing the economic development of our rapidly changing society or what we call globalization. Parents must be convinced that the educators are teaching different skills from those of a generation ago and are better preparing students with the basic work readiness skills employers are seeking (Cavanagh, 2005).

Moreover, students who were involved in ways of learning were in most cases rather enthusiastic about this, as they found that this kind of learning was more fun and was experienced as more meaningful than the traditional ways of learning (Moore, 2010).

Careers of the 21st century now require some form of post-secondary education. More specifically, Dohm and Shniper (2007) reported that 73% of the fastest growing occupations require some form of post-secondary education or training. College-ready students are more likely to be prepared for post-secondary education and the workforce (Cline, Bissell, Hafner, & Katz, 2007) and to be ready to participate in the social and political aspects of citizenship (Dougherty, Mellor, & Smith, 2006) than are students who are not college-ready.

In addition, an economic benefit exists to the individual and to the public when students are adequately prepared for college (Merisotis & Phipps, 2000). Unless students qualify for financial aid, they and their parents may face an additional burden as they may have to pay for courses for which they do not get credit. Accordingly, students may then require more semesters in which to graduate. Moreover, across the nation in both 2-year and 4-year institutions of higher education the likelihood exists that some students regardless of ethnicity or economic status who take one or more developmental courses may not graduate (Bettinger & Long, 2004; Deil-Amen & Rosenbaum, 2002; Merisotis & Phipps, 2000; National Center for Education Statistics [NCES], 2004) and may experience a lower income related to not completing an undergraduate degree. Furthermore, a loss of financial benefit exists to the community when students who start college do not finish and earn their degrees (Merisotis & Phipps, 2000).

The perception of the level of preparedness by business students, faculty, and employers has been found to significantly differ throughout research, which raises questions as to the overall accuracy of post-internship assessment being performed (Abraham & Karns, 2009). Since internships have been found to improve employability, this topic is important for universities to explore.

Still, many high school graduates fall short of being prepared to be successful in post-secondary education. Green and Forester (2003) stated: More than half of the students who do graduate from high school, and more than two-thirds of all the students who start high school, do not graduate with the minimal requirements needed to apply to a four-year college or university.

With this, we can really say that the work components to CCR model are very important since senior high school students must be equipped with fundamental knowledge and skills especially before graduating from senior high school. It is very essential to each of the students to be able to give value and understand the value of being college and work-ready. If the students will be able to continue and grab a degree program after graduating in senior high, he/she should be able to adjust and be prepared with necessary skills that would fit to their chosen fields. Also, if the students will push through with working careers, basic career skills and appropriate behavior towards the other people must be considered for them to be able to adapt change of environment.

Methodology

Basing on the review of literature in the previous chapter where it provides definition for college and career readiness, assessable characteristics of college and career readiness, and variables that play a role in student acquisition of college and career ready skills, knowledge, and behaviors. This study will investigate how graduates were influenced to engage in college and career readiness skills, understandings, and behaviors during or after high school, including who and what contributed to graduate engagement in college and career ready skills and knowledge. This chapter provides details on the inquiry setting and the research methods for collecting and analyzing the interview data.

This chapter presents the methods employed in knowing how graduates were influenced to engage in college and career readiness skills, understandings, and behaviors during or after high school, including who and what contributed to graduate engagement in college and career ready skills and knowledge. It consists of the following sections: (a) Research Setting, (b) Research design, (c) Respondents and Sampling Procedure, (d) Research Instruments, (e) Validity and Reliability of the Instruments, (f) Research Protocol, (g) Data Gathering Procedure, (h) Methods of the Data Analysis, and (i) Statistical Techniques.

Research Setting

This study was conducted among the College of Business and Accountancy freshmen students who graduated under the Accountancy, Business and Management (ABM) strand regardless which school they came from. Respondents are currently studying in Liceo de Cagayan University, Cagayan de Oro City.

The College of Business and Accountancy is composed of six courses: Bachelor of Science in Business Administration, Bachelor of Science in Accountancy, and the Management courses.

Research Design

The study used both qualitative and quantitative research designs. This research is all about knowing, measuring, and identifying whether the work immersion subject of ABM in SHS graduates relates to the four components to CCR model. This research is designed in a way that the SHS graduates describe the value of college and career development programs based on their work immersion subject. Questionnaires were hand-given to the respondents in order to absorb the possible related response rate. To minimize the frustrations of the respondents, hence, the number of uncompleted questionnaires, the number of questions were limited.

Respondents and Sampling Procedure

The researcher conducted random sampling which focused to the topics related only to the said research that could come-up with the result on determining the importance of Work Immersion subject for them to be ready and equipped with the proper tools and attributes to enter college and/or employment.

The questionnaire was constructed with several parts. First part details the respondent's demographic profile including the respondent's sex, age, course in college, previous school, grade in Work Immersion, and the like. Next part details the learning experiences in relation of the work immersion to the work components of CCR. Another part measures the respondent's learning outcomes and its college experiences which describes the importance of CCR based on the students work immersion experiences. The final part details the college and career planning which describes their adjustment experiences beyond senior high school. A total of 174 respondents out from the 317 respondents will be asked in conducting this research.

The basis for obtaining the sample size was the total students enrolled in the College of Business and Accountancy who are graduates of Accountancy, Business and Management during their senior high school. The population size is quite large; hence random sampling was employed. The researcher employed the Slovin's Formula to get the sample population. There were 174 actual respondents in the study that were randomly selected employing room-to-room visit in conducting the survey. Before the respondents started answering the questionnaires, the researcher discussed first the details of the instrument. Concerns and clarifications from the respondents about the questionnaire were answered directly by the researcher while waiting for the respondents to finish.

Slovin's Formula:

$$n = N / (1+Ne2)$$

Where:
n = sample size
N = total population
e = margin of error

Research Instrument

The instrument used a modified survey questionnaire by Resch (2011) for the gathering of data to determine the importance of Work Immersion subject for them to be ready and equipped with the proper tools and attributes to enter college and/or employment. The questionnaire consisted of two parts: Part I aimed to get information about the respondents' demographic profile considering their sex, age, course in college, previous school and grade in Work Immersion, if they are currently employed, their financial sponsors, and the Work immersion relate to the CCR. Part II of the questionnaire dealt with the respondents' self-efficacy towards College and Career Readiness in terms of their learning experiences, learning outcomes, college experiences, college and career planning by giving how important Work Immersion is as well as the respondents' adjustment experiences toward college and/or career. The instrument responds to a five-point scale of (5)Strongly Agree, (4)Agree, (3)Moderately Agree, (2)Disagree, (1)Strongly Disagree and (3)Many Times, (2)Once or Twice, and (1)Never.

Validity and Reliability of the Instruments

The data were obtained through a modified questionnaire. Before finalizing the questionnaire, the tool underwent a Content Validity Testing done by the experts of the field. To ensure that all the necessary information would be included in the research instrument, the questionnaire had gone a series of scrutiny from the adviser and consultations with the experts. The questionnaire has been finalized after a series of revisions and modifications prescribed by the adviser and the experts, as per advised by the panel members during the proposal defense. The final form of the instrument was submitted to the adviser for final review and approval for production prior to its distribution to the respondents.

Research Protocol

To ensure the quality and reliability of research findings, the researcher observed the following University
Research Protocol:

1. The researcher sought approval from the adviser after careful assessment and review of the manuscript for the thesis.

2. The Dean of the School of Graduate Studies approved the schedule for the defense of the thesis proposal after thorough assessment and review of the final manuscript.

3. After the proposal defense, the researcher accomplished the Research Ethics Application Form and submitted to the Office of the Vice President for Research, Publication, and Extension together with the approved research proposal.

4. The Associate Director of the Research, Publication, and Extension Office reviewed the proposal and Research Ethics Form for completeness and for compliance with the University format and guidelines. The research ethics for was then forwarded to the RPEO Director and Vice President for Research, Publication and Extension for further review and approval of the Research Ethics Review Committee.

5. The researcher wrote letters and secured permission from the University President, University Vice President, Dean of the School of Graduate Studies, Registrar's Office, Dean of the College of Business and Accountancy, prior the data gathering to ensure the university administrators' consent.

6. The researcher also secured the respondents' consent to participate in the study. Moreover, the respondents were assured that all their responses would be treated with utmost confidentiality.

7. Provision of the final manuscript. The researcher provided the adviser the copy of the manuscript for assessment and review of the quality and relevance of the paper before the scheduling of the final research presentation.

8. Once the paper was approved by the adviser, it was forwarded to the Research Coordinator for further review of the completeness of the paper. The Coordinator meets with the Dean for the scheduling of the paper presentation.

9. After the final paper presentation, the researcher incorporated all the corrections and suggestions of the Research Panel. It was then reviewed by the adviser and the panel member.

10. After the final paper was approved by the panel, it was then submitted to the Research, Publication, and Extension Office for Plagiarism and Grammarly Tests.

11. The researcher then forwarded the final paper to their assigned editor. After incorporating all the corrections, the researcher submitted the final paper to the adviser and Research Panel for signature and approval for binding.

Data Gathering Procedures

The responses were coded, tallied, and collated in tables for purposes of statistical treatment and data analysis. For the independent variables, the following scale was used.

Data on sex is nominal. This data is in the form of frequencies fitting discrete and distinct categories. Thus, the score assigned to this variable is 1 and 2.

For the course in college, the following scale was used:

Range	Points
Bachelor of Science in Accountancy	1
Bachelor of Science Business Administration	2
Bachelor of Science Hospitality and Management	3
Bachelor of Science Real Estate Management	4

For the average grade in Work Immersion, the following scale was used:

Grade	Points
96-100	1
91-95	2
86-90	3
81-85	4
75-80	5

For the financial sponsors, the following scale was used:

Sponsors	Points
Family	1
Relatives	2
Scholarship	3
Self-support/work	4
Others	5

For the employment status, the following scale was used:

Are you currently employed?	Points
No	1
Yes	2

For the scholarship/s availed, the following scale was used:

Granting Institution	Points

None	1
Government	2
Private Company	3
Others	4

On the students' learning experiences, learning outcomes, and college experiences, the following scale was used:

Responses	Points	Interval Scale	Description
Strongly Agree	5	4.50 – 5.00	Very Satisfied
Agree	4	3.50 – 4.49	Satisfied
Moderately Agree	3	2.50 – 3.49	Moderately Satisfied
Disagree	2	1.50 – 2.49	Needs Improvement
Strongly Disagree	1	1.00 – 1.49	Not at all Satisfied

On the students' college and career planning, the following scale was used:

Responses	Points	Interval Scale	Description
Many Times	3	2.50 – 3.00	Always
Once or Twice	2	1.50 – 2.49	Sometimes
Never	1	1.00 – 1.49	None at all

Methods of Data Analysis

Mean and Frequency were used on respondents' profile specifically on age, gender, and financial sponsors, average grade in Work Immersion, and respondents' availed scholarships. The data was presented to the statistician for further scrutiny of the measurability on the questions given. The tool had undergone content validity, and the statistician approved the tool for the validity and was advised to proceed to the administration of survey questionnaire. The results were presented to the adviser and panel after the finalization of data collection.

Statistical Techniques

The data gathered were tabulated and statistically treated for analysis and interpretation using statistical measure and treatment. Descriptive statistics such as mean, frequency, and percent distributions were employed for problem 1 on the relatedness of Work Immersion to the College and Career Readiness model as the unit of analysis. For problems 2 and 3, mean and standard deviation and their corresponding description were used to present the data on students' experiences and adjustments for college and career. Minitab is used to produce reliable statistical data from the gathered questionnaires from the respondents.

Results and Discussions

This chapter presents the data gathered and the analysis as well as its interpretation. The answers are presented based on the sequence of the problem stated in Chapter 1. For the mode of analysis, descriptive statistics such as mean, frequency, and percent distributions were employed for problem 1 on the demographic profile of the respondents. For problem 2, mean and standard deviation and their corresponding description were used to present the data on the level of College and Career Readiness of the students as the unit of analysis.

PROBLEM NO. 1: What is the demographic profile of the respondents?

a. Sex
b. Age
c. Course
d. Previous School
e. Grade in Work Immersion
f. Employment Status
g. Financial Sponsors
h. Scholarship/s

Table 1
Frequency and Percentage Distribution According to Respondent's Profile

		Frequency	Percentage
Sex	Male	41	23.56
	Female	133	76.44
	Total	**174**	**100.00**
Age	18	55	31.61
	19	94	54.02
	20	19	10.92
	21 and above	6	3.45
	Total	**174**	**100.00**
Course	BS in Accountancy	62	35.63
	BS in Business Administration	48	27.59
	BS in Hospitality and Management	26	14.94
	BS in Real Estate Management	38	21.84
	Total	**174**	**100.00**
Previous School (SHS)	Liceo de Cagayan University	79	47.88
	Capitol University	6	3.64
	Cagayan de Oro College	26	15.76
	Lourdes College	7	4.24
	Southern Philippines College	2	1.21
	Kong Hua School	2	1.21
	Fatima College of Camiguin	6	3.64
	Bulua National High School	3	1.82
	Lapasan National High School	2	1.21
	Merry Child School	4	2.42
	Saint Columban College	3	1.82
	Bukidnon State University	3	1.82
	Cagayan de Oro City High School	2	1.21
	Christ the King College	1	0.61
	Agusan National High School	1	0.61
	Alubijid National Comprehensive High School	1	0.61
	Blessed Mother College	1	0.61
	Central Visayas Institute Foundation	1	0.61
	Corpus Christi School	1	0.61
	Dangcagan National High School	1	0.61
	Holy Cross High School	1	0.61
	Iligan Capitol College	1	0.61
	Kinawe National High School	1	0.61
	Medina National Comprehensive Hs	1	0.61
	Misamis Occidental National High School	1	0.61
	Opol National State College	1	0.61
	RC-Al Khwarizmi International College Foundation, Inc.	1	0.61
	Saint Joseph Institute of Technology	1	0.61
	Salay National High School	1	0.61
	St. Michaels College	1	0.61
	St. Paul School	1	0.61
	STI CDO	1	0.61
	STI College Fairview	1	0.61
	*No Given Data	6	0.61

	Total	**174**	**100.00**
Grade in Work Immersion	96 – 100	24	13.79
	91 – 95	106	60.92
	86 – 90	37	21.26
	81 – 85	6	3.45
	75 – 80	1	0.57
	Total	**174**	**100.00**
Employment Status	No	174	100.00
	Yes	0	0.00
	Total	**174**	**100.00**
Financial Sponsors	Family	95	54.60
	Relatives	2	1.15
	Scholarship	77	44.25
	Self-support/Work	0	0.00
	Others	0	0.00
	Total	**174**	**100.00**
Scholarship Availed	None	96	55.17
	Government	53	30.46
	Private Company	25	14.37
	Others	0	0.00
	Total	**174**	**100.00**

Sex. Table 1 shows that the ratio of students enrolled in CBA who graduated under the ABM strand according to their sex that 133 or 76.44 percent of the respondents are composed of female students outnumbered male students who composed on 41 or 23.56 percent or more than three forts of the sample population.

Age. Table shows that the frequency and percentage distribution of respondents in terms of age. Data revealed that majority of the respondents 94 or 54.02 percent are age 19 years old though some of them 55 or 31.61 percent were age 18 years old. Few 19 or 10.92 percent are 20 years old. Least of the respondents are 6 or 3.45 percent were 21 years old and above.

Course. There were four courses under the College of Business and Accountancy namely: Bachelor of Science in Accountancy, Bachelor of Science in Business Administration, Bachelor of Science in Real Estate Management, Bachelor of Science in Hospitality and Management. Results show that majority of the respondents are currently taking the course of Bachelor of Science in Accountancy with a frequency of 62 or 35.63 percent. Followed by Bachelor of Science in Business Administration with 48 or 27.59 percent of the sample population. Bachelor of Science in Real Estate Management has 38 or 21.84 percent while Bachelor of Science in Hospitality and Management has the lowest turnout of the enrolled students with 26 or 14.94 percent of the total sample population.

According to bachelorstudies.com (2019), business courses rank forth (4th) among the 47 Top Bachelor of Science Degrees in the Philippines in 2019. Business studies is an area of study in which students learn the skills necessary for running a business. Different topics may include advertising, marketing, managing money, communication, administration, business plan writing, and the hiring and training of employees.

Previous School. Data shows that majority of the respondents are graduates from Liceo de Cagayan University – Senior High School with 79 or 47.88 percent from the total sample population. It implicates that there are many students coming from LDCU SHS still choose Liceo in pursuing college. Cagayan de Oro College ABM SHS graduates has 26 or 15.76 percent of the students enrolled in Liceo U. Lourdes College with 7 or 4.24 percent, Capitol University and Fatima College of Camiguin both has 6 or 3.64 percent, followed by Merry Child School with 4 or 2.42 percent of the sample population. Schools outside the CDO like Saint Columban College of Pagadian, RC-Al Khwarizmi International College Foundation, Inc. of Marawi City, Saint Joseph Institute of Technology of Butuan City, STI College Fareview of Quezon City, Bukidnon State University of Bukidnon, and the like also contributed to the university's CBA enrolment.

According to 2019 Northern Mindanao University Ranking (2019), Liceo de Cagayan University ranked seventh (7TH) placed our from the 12 recognized Northern Mindanao higher-education institutions meeting the following uniRank selection criteria: being chartered, licensed and/or accredited by the appropriate Philippines higher education-related organization, offering at least four-year undergraduate degrees (bachelor degrees) or postgraduate degrees (master or doctoral degrees), and delivering courses predominantly in a traditional, face-to-face, non-distance education format.

While according to FinUniversity.ph Philippine Universities Ranking (2019), Capitol University has 39.50 percent (top 6), Cagayan de Oro College has 49.80 percent (top 5). Lourdes College with 52.50 percent (top 4), while Liceo de Cagayan University garnered a weighted ranking average of 56.50 percent (top 3). Landing on top 2 is University of Science and Technology of Southern Philippines with a weighted ranking average of 57.70 percent and Xavier University-Ateneo de Cagayan bagged the number spot with 80.30 percent basing on its 22 exams.

Grade in Work Immersion. Table 1 shows the frequency distribution of respondents in terms of grade in Work Immersion. Data indicates that 24 or 13.79 percent are in the grade bracket between 96 percent, and above which implicates such students performed near to perfection or excellence during their Work Immersion program in SHS though 106 or 60.92 percent were able to have a grade of 91 – 95 which means that they are satisfied and were able to do their best during their immersion. Few 6 or 3.45 percent of the respondents are within 81 – 85 grade bracket. Least of the respondents is 1 or 0.57 percent within the grade bracket of 75 – 80.

Employment Status. The table also presents the frequency and percentage distribution of respondents' profile in terms of employment status. Results show that all of the respondents were unemployed and are dependent to their family as well as to the scholarships availed.

The Department of Education (2018) has welcomed a recent survey showing 24 percent of companies are ready to hire senior high school graduates this year. Education Undersecretary Jesus Mateo said the survey conducted by employment website JobStreet is a welcome opportunity for DepEd to have baseline data on employer's willingness to hire K-12 graduates. Twenty-four percent is about two in every 10 of company employers, a good enough percentage to take in K-12 graduates in entry level positions doing administrative and support work to technical, supervisory and managerial levels. It is a challenge at the same time for K-12 graduates to develop their skills and be the company's engine to growth. Coupled with the right attitude, they will surely succeed in the labor market. The survey conducted by JobStreet as part of its 2018 Fresh Graduate Report showed that only 24 percent of employers using the website are ready to hire the first batch of graduates of the K-12 program.

The lack of available positions for non-college graduates and the supposed insufficient work experience of K-12 graduates were the primary reasons cited by employers who said that they are not ready to accept senior high school graduates. Those who were undecided said that they are either evaluating the readiness of their companies or are still finalizing the timeline on when they would hire K-12 graduates. On Friday, business leaders called on companies to consider hiring senior high school graduates.

According to del Rosario of the Philippine Business for Education, there really are jobs that do not need a full four-year degree to start with. Just because there's surplus of college graduates does not justify discriminating against those who do not have a college degree.

That's the appeal we're making — open our minds to the possibility that senior high school graduates do have enough competencies for certain jobs. There are certain specific jobs that can be filled by people who do not have college degrees, particularly those who have benefited from the senior high

school curriculum. While it is still a work in progress, they do have the competencies for some jobs. All we're saying is, do not discriminate against them. PBEd has initiated an affirmative hiring initiative for K-12 graduates to provide opportunities to as many as 600,000 senior high school graduates who may want to join the workforce. The program aims to enjoin companies to rethink their hiring policies by opening entry-level position for senior high school graduates, del Rosario (2018)
Financial Sponsors. The same table shows the frequency and percentage of respondents with regards to their financial sponsors while studying in college. Results show that many 95 or 54.60 percent of the respondents are personally financed and supported by their own families while some 77 or 44.25 percent of the respondents' schooling are financed through a scholarship whether it comes from the government or private company/institution.

Scholarship Availed. Also shown in the Table is the frequency and percentage of the respondents' profile according to the scholarships availed during their stay in college. Data revealed that majority 96 or 55.17 percent of the respondents are not dependent with scholarships which indicates that their studies are funded by their family alone. While some 53 or 30.46 percent of the respondents' education are beneficiaries of the government. Only a few 25 or 14.37 percent of the respondents' education are financed by private companies. Data also shows that student assistantship, city scholarship, and the like are the components of scholarships availed by most respondents.

PROBLEM NO. 2: What is the level of college and career readiness of the students? In terms of;

a. Learning Experiences,
b. Learning Outcomes,
c. College Experiences, and
d. College and Career Planning

Table 2
College and Career Readiness According to the Learning Experiences of the Respondents

Reflecting on the classes you have taken in Work Immersion subject, indicate the extent to which you agree or disagree with the following statements about your learning experiences. When I think about my Work Immersion classes and instructors…	**Mean**	**Standard Deviation**	**Verbal Description**	**Interpretation**
1. I feel accepted as a capable student by my instructors.	4.07	0.80	Agree	Satisfied
2. I feel accepted as a person by my instructors.	4.14	0.80	Agree	Satisfied
3. My instructors make me feel as though I bring valuable ideas to class.	3.91	0.77	Agree	Satisfied
4. My instructors understand that students come from different backgrounds.	4.09	0.84	Agree	Satisfied
5. My instructors are interested in what I have to share in class.	3.90	0.79	Agree	Satisfied
6. My instructors seem to genuinely care how I am doing.	3.84	0.82	Agree	Satisfied
7. The pace of my classes is appropriate for me.	3.90	0.83	Agree	Satisfied
8. I am encouraged by my instructors to openly share my views in classes.	3.84	0.88	Agree	Satisfied
9. I feel motivated to come to my classes.	3.98	0.80	Agree	Satisfied
10. I can express my honest opinions in my classes.	3.82	0.91	Agree	Satisfied
11. My instructors show that they believe in my ability to do the class work.	3.91	0.85	Agree	Satisfied
12. My instructors give me enough time to understand the class material.	3.83	0.91	Agree	Satisfied

13. My instructors care about my learning.	4.01	0.86	Agree	Satisfied
14. My instructors are willing to help me at all times.	4.01	0.91	Agree	Satisfied
Total	**3.95**	**0.84**	**Agree**	**Satisfied**

Legend: 5 – Strongly Agree 4 – Moderately Agree 3 – Agree 2 – Disagree 1 – Strongly Disagree

Range	Point Value	Responses	Description
4.50 – 5.00	5	Strongly Agree	Very Satisfied
3.50 – 4.49	4	Agree	Satisfied
2.50 – 3.49	3	Moderately Agree	Moderately Satisfied
1.50 – 2.49	2	Disagree	Needs Improvement
1.00 – 1.49	1	Strongly Disagree	Not at all Satisfied

Table 2 revealed the relatedness of Work Immersion program to the Career and College Readiness according to the respondents' learning experiences. Data revealed that respondents are satisfied, in general, when it comes to their capability, acceptance, interest, understanding, appropriateness, and willingness to solve problems and to balance time.

On the improvement of their skills and abilities, being able to comprehend from the different situation they might be in, as well as their understanding about college and career and its importance. This posed and important implication to the importance of college and career readiness to the students to prepare them for the future, may it be in college or in employment. Data revealed that respondents, in general, that the Work Immersion program of the senior high school relate to CCR with the mean of 3.95 or students were satisfied of the Work Immersion program of their respective schools during their senior high school.

Table 3
College and Career Readiness According to the Learning Outcomes of the Respondents

Thinking about your experience in the Work Immersion subject, indicate the extent to which you agree or disagree with the following statements about what you have learned.

As a result of Work Immersion…	Mean	Standard Deviation	Verbal Description	Interpretation
1. I have improved my numerical skills.	3.82	0.82	Agree	Satisfied
2. I have improved my written communication skills.	3.91	0.77	Agree	Satisfied
3. I have improved my oral communication skills	4.03	0.79	Agree	Satisfied
4. I have improved my vocabulary.	3.77	0.80	Agree	Satisfied
5. I have improved my ability to solve problems.	3.85	0.83	Agree	Satisfied
6. I have improved my ability to read graphs and charts.	3.67	0.85	Agree	Satisfied
7. I have improved my ability to defend my point of view.	3.80	0.80	Agree	Satisfied
8. I have gained a better understanding on different issues and points of view.	3.98	0.86	Agree	Satisfied
9. I am more able to do research and use reference materials.	3.78	0.81	Agree	Satisfied
10. I have increased my understanding of different societies and peoples.	4.02	0.78	Agree	Satisfied
Total	**3.86**	**0.81**	**Agree**	**Satisfied**

Legend: 5 – Strongly Agree 4 – Moderately Agree 3 – Agree 2 – Disagree 1 – Strongly Disagree

Range	Point Value	Responses	Description
4.50 – 5.00	5	Strongly Agree	Very Satisfied
3.50 – 4.49	4	Agree	Satisfied
2.50 – 3.49	3	Moderately Agree	Moderately Satisfied
1.50 – 2.49	2	Disagree	Needs Improvement
1.00 – 1.49	1	Strongly Disagree	Not at all Satisfied

Table 3 revealed the importance of college and career development program according to the learning outcomes of the respondents. Data revealed that respondents are satisfied, in general, when it comes to the improvement of their skills and abilities, being able to comprehend from the different situation they might be in, as well as their understanding about college and career and its importance. This posed and important implication to the importance of college and career readiness to the students to prepare them for the future, may it be in college or in employment.

Data implicates that the components including a strong early reading and mathematics program; a content-rich curriculum not only in English, Language Arts and Mathematics, but also in Science, History, Geography, and the like; and activities designed to develop students' academic and social behaviors. Also, the abilities of the students to comprehend that learning gaps emerge early, particularly among disadvantaged students, is one of the better-documented facts in education. Students who do not have a good start usually do not thrive later on. That is due not only to the fact that students in stressful environments with limited learning opportunities often remain in those environments, but also because early learning itself facilitates later learning—students who already know more about a topic often have an easier time learning additional information on the same topic, and early exposure to knowledge can stimulate students to want to learn more. Behaviors such as paying attention, completing assignments, persisting in difficult tasks, and regulating one's own actions (thinking before acting) play a large role in students' success in school and later on in life, Daugherty (2013).

According to Daugherty (2013), monitoring student learning is vital for helping educators make instructional decisions: to identify which students need extra help; to place students in learning groups or intervention programs; to know which concepts need to be retaught; and to identify which lessons, teaching strategies, or instructional materials are working. This requires schools and districts to use assessments in the early grades that are based on the district's written curriculum. Frequent formative assessment is needed throughout the year in order for teachers to respond quickly to student needs and keep parents informed about how their children are doing.

The data answers the question "how do SHS graduates describe the importance of college and career development programs based on their work immersion subject's experiences?" with the answer of "agree" or "satisfied" which means people surrounding the respondents have somehow given them the idea about college and influenced them in pursuing to college. They also generated ideas about career goals in life and the importance of college and career planning ahead of time for them to be equipped with the fundamental knowledge and skills needed for their future endeavors.

Table 4
College and Career Readiness According to College Experiences of the Students

Thinking about your experience in the Work Immersion subject, indicate the extent to which you agree or disagree with each of the following statements about your readiness to go to college and/or choose a career.				
As a result of Work Immersion during my senior high school…	**Mean**	**Standard Deviation**	**Verbal Description**	**Interpretation**
1. I have learned how to organize my time and tasks.	4.20	0.74	Agree	Satisfied
2. I have improved my study skills.	4.02	0.77	Agree	Satisfied
3. I have learned helpful study strategies.	4.11	0.83	Agree	Satisfied

4. I understand my academic strengths and what I still need to improve.	4.15	0.72	Agree	Satisfied
5. I know the importance of not giving up and sticking through difficult subjects.	4.24	0.74	Agree	Satisfied
6. I have learned how to work with other students.	4.24	0.71	Agree	Satisfied
7. I have formed a bond with an adult or mentor who can help me with college and/or career advice.	4.05	0.74	Agree	Satisfied
8. I have improved my attitude towards school.	4.18	0.72	Agree	Satisfied
9. I have gained the skills to succeed in college-level courses.	4.00	0.74	Agree	Satisfied
10. I understand the college application process and deadlines.	4.04	0.79	Agree	Satisfied
11. I understand college requirements.	4.11	0.80	Agree	Satisfied
12. I understand the value of getting a college degree.	4.32	0.74	Agree	Satisfied
13. I understand the college financial aid process.	4.13	0.85	Agree	Satisfied
14. I have learned about support services and resources available in college.	4.05	0.83	Agree	Satisfied
15. I have an idea of what I want to do with my career.	4.23	0.82	Agree	Satisfied
Total	**4.14**	**0.77**	**Agree**	**Satisfied**

Legend: 5 – Strongly Agree 4 – Moderately Agree 3 – Agree 2 – Disagree 1 – Strongly Disagree

Range	**Point Value**	**Responses**	**Description**
4.50 – 5.00	5	Strongly Agree	Very Satisfied
3.50 – 4.49	4	Agree	Satisfied
2.50 – 3.49	3	Moderately Agree	Moderately Satisfied
1.50 – 2.49	2	Disagree	Needs Improvement
1.00 – 1.49	1	Strongly Disagree	Not at all Satisfied

Table 4 shows the adjustments made by the respondents upon entering into college life and their readiness to college from the experiences they have undergone while having the work immersion. Results show that the respondents with a mean of 4.14 and a standard deviation of 0.77 agree on the following indicators; that they have learned things like how to be prepared in college and career, how to socialize with others may it be in work or in the classroom, how to be organize in things that would greatly affect our performance in whatever we do. Data also pose implications on respondents' improvement in their attitude in school, their study skills, and the like. Also, results say that respondents understood college application requirements and process, its services, its financial aspects, and most especially the value of getting a degree.

Identified factors that affect learning adjustment among high school students include environmental factors; e.g., family socioeconomic status, parenting style, teacher support, peer friendship, and social environment, (Hair and Graziano, 2003; Verner-Filion and Gaudreau, 2010; Butler, 2011; Garg et al., 2016) and individual factors (e.g., personality, intelligence, achievement motivation, and academic self-efficacy) (Powers et al., 2005; Gunnoe, 2013; Shin and Ryan, 2014; Larose et al., 2018). Previous research has reported that academic help seeking explains the internal mechanism of students' learning adjustment. When students solve their academic problems by asking for help from others, thereby enhancing their understanding, they exhibit adaptive academic behavior (Chen et al., 2018).

Table 5
College and Career Readiness of the Students According to College and Career Planning

A.) How often have you discussed the admission requirements for college with each the following people?				
People who may have advised you on admission requirements for college:	**Mean**	**Standard Deviation**	**Verbal Description**	**Interpretation**
1) Your parent(s)/guardian(s)	2.75	0.53	Many Times	Always
2) A senior high school counselor	1.86	0.73	Once or Twice	Sometimes
3) A senior high school teacher	2.22	0.67	Once or Twice	Sometimes
4) Friends/other students	2.43	0.66	Once or Twice	Sometimes
5) Your brother or sister	1.93	0.79	Once or Twice	Sometimes
6) Another relative	1.93	0.72	Once or Twice	Sometimes
7) College recruitment/promotions officer	1.81	0.74	Once or Twice	Sometimes
8) A high school coach	1.63	0.75	Once or Twice	Sometimes
9) A staff where you had your work immersion	1.87	0.76	Once or Twice	Sometimes
10) Others (*Please specify*):				
Total	**2.05**	**0.71**	**Once or Twice**	**Sometimes**
B.) How often have you discussed career plans with each of the following people?				
People who may have advised you on career plans for college:	**Mean**	**Standard Deviation**	**Verbal Description**	**Interpretation**
1) Your parent(s)/guardian(s)	2.77	0.47	Many Times	Always
2) A senior high school counselor	1.83	0.75	Once or Twice	Sometimes
3) A senior high school teacher	2.01	0.73	Once or Twice	Sometimes
4) Friends/other students	2.33	0.69	Once or Twice	Sometimes
5) Your brother or sister	1.94	0.80	Once or Twice	Sometimes
6) Another relative	1.92	.71	Once or Twice	Sometimes
7) College recruitment/promotions officer	1.72	0.71	Once or Twice	Sometimes
8) A high school coach	1.62	0.73	Once or Twice	Sometimes
9) A staff where you had your work immersion	1.72	0.72	Once or Twice	Sometimes
10) Others (*Please specify*):				
Total	**1.98**	**0.70**	**Once or Twice**	**Sometimes**

Legend: 3 – Many Times 2 – Once or Twice 1 – Never

Range	**Point Value**	**Responses**	**Description**
2.50 – 3.00	3	Many Times	Always
1.50 – 2.49	2	Once or Twice	Sometimes
1.00 – 1.49	1	Never	None at all

Table 5 shows whether people surrounding them have advised the respondents about college and career plans. Data revealed that students received an average result of once or twice advice from people surrounding them. Results also show that parents with a mean of 2.75 and 2.77 and with standard deviation of 0.53 and 0.47, were able to consistently give advice to their children about admission to college and discussed career plans many times.

Research have identified many variables which correlate with and have an impact on students' decisions to pursue higher education. Of these factors, family influence emerges as one of the most important. Students face the struggle of making big decisions when entering college and, with thousands of dollars at stake, parents contribute to these decisions. Students are becoming heavily influenced by their parents when picking a college or major in college, according to a Noel-Levitz Benchmark Psychographic study (2018), titled Institutional Brand and Parental Influence on College Choice.

According to the above study, "Parental involvement can certainly play a large role in college decisions of prospective students—especially in an era of growing 'helicopter parents' who are very hands-on with their children's educational careers."

The study reports that parental influence increases when parents volunteer in their classroom growing up, talk about grades with their student, assist with ACT/SAT studying and have a saving account for their student.

This parental influence begins at a young impressionable age, according to the study. Parents make their kids play sports, join clubs and go on unsolicited playdates. Then, it spreads to high school, where parents pick out students' classes, switch their teachers, convince them to continue sports, be in the National Honors Society, be on the band and do everything they can that will look good on a college application.

Data also revealed that friends/other students with a mean of 2.43 and 2.33 and with standard deviation of 0.66 and 0.69, were able to give advice to the respondents about admission to college and discussed career plans sometimes.

Psychology experts, Laurence Steinberg and Jason Chein (2018) have detailed many elements of peer influence and adolescent decision-making. Many mistakenly think of "peer pressure" as a direct ask or overt bullying, but their studies show adolescent behavior is impacted by the mere presence of peers, meaning that most peer influence is actually implicit. If we misunderstand how peer influence is exerted, then we can never address the issue at its root – by ultimately changing the culture, attitudes and accepted behaviors in our own communities and schools.

Result also shows that senior high school teachers with a mean of 2.22 and 2.01 and with standard deviation of 0.67 and 0.73, were able to give advice to the respondents about admission to college and discussed career plans sometimes. Teachers can also be a trusted source of advice for students weighing important life decisions. Educators can help their pupils pursue higher education, explore career opportunities and compete in events they might otherwise have not thought themselves able to. Students often look to their teachers as mentors with experience and knowledge, and, as an educator, you will almost definitely be asked for advice at some point during your career.

Did you know that one from four students drops out of school or that every nine seconds, another student drops out? Dropping out is a decision that students won't likely come to you about, but an adept teacher can notice the indications that a student is struggling and intervene before it's too late. Aside from educating the students on the hard facts about dropping out, teachers can also help assess the problem and figure out an alternative. In such situations, teachers undoubtedly have the ability to change the lives of students.

Table 6
College and Career Readiness of the Students According to College and Career Planning

		Frequency	Percentage
First Time to Receive an Advice	Grade 9 or earlier	14	8.05
	Grade 10	39	22.41
	Grade 11	21	12.07
	Grade 12	79	45.40
	I haven't received any advice	21	12.07
	Total	**174**	**100**

First Time Receive an Advice. Table 6 shows the frequency and percentage distribution of the respondents according to the first time they received some advice from their school on the proper course to take to gain admission to college. Data revealed that majority 79 or 45.40 percent of the respondents were informed during their Grade 12 which means it's quite late that the respondents were informed about receiving some advice into college. While some 39 or 22.41 percent are during their Grade 10. Only few 21 or 12.07 percent said that they first received some advice during their Grade 11 while 14 or 8.05 said they first received some advice during Grade 9 or earlier. Few 21 or 12.07 percent of the respondents said they haven't received any advice from people around them.

According to an Admission Consultant, Michelle Green (2012), by the beginning of senior year, the students should have narrowed their list to the schools they will be applying to, which should be from approximately 6-12 schools. Students should keep all of their options open when they begin the college search process.

Qualitative Data Analysis

To add validation on how Work Immersion became helpful and relevant to the students' college and career goals, a qualitative method of data gathering was utilized to establish an analysis of the results of the study. It will be used to draw depth and supplement in the results of quantitative data gathered in this study.

Two main themes emerged from the analyses: (1) relevant activities and (2) challenges encountered.

Theme 1. RELEVANT ACTIVITIES

The following responses were gathered:

PROBLEM NO. 3: What is the relevance of work immersion program?

Statements
Clerical and administrative works in the bank made me realize that my career goal is really in line with business.
Doing financial ledgers, receipt reconciliation, and the like helped me now for my basic accounting subject.
The very relevant in helping my college and career goals is when we were working all of our requirements and deadlines were met. Also, I was able to communicate well with other people and gained confidence.
When it comes on balancing my time on which should I undertake first and what is the least attention I must do.

The statements of the respondents on the relevance of Work Immersion to their college and career goals revealed that most of the respondents mentioned that the work immersion is relevant to their college life for today as they were able to apply those experiences they have gained or learned from their respective companies. Students are very thankful in experiencing those activities which helped them be prepared to enter college and even in future career.

Theme 2. CHALLENGES ENCOUNTERED

The following responses were gathered:

PROBLEM NO. 4: What are the challenges encountered in the work immersion?

Statements
When I felt over-tasked. All the works and co-workers were expecting a lot from my performance that make me feel pressured.
I was very challenged in looking for a company to do the work immersion. Being the pioneering batch of the work immersion, many flaws surfaced, and it was not properly planned by the curriculum and the university.
Time management is very difficult at that time because we were having classes during morning and immersion in the afternoon. We also realized that working in a hotel is not simple.
When I was forced to come out from my comfort zone and had to mingle with the clients.

The statements of the respondents with regard to the challenges they have encountered during their Work Immersion resulted to more students “find it hard to have time management”. Respondents also revealed “lack of knowledge on what to do”, “adjustment period”, “being challenged or pressured”, and the like. These findings also support the first theme which revealed that despite of having hard time dealing with deadlines, whether in work or in academics, they still tried their best to overcome and able to handle stress.

Time management is about how you organize and plan the time you spend on specific activities. On the surface of things, it seems that time management should be easy and straightforward—something that just happens. In practice, time management is a skill that takes effort to develop.

An article “Time Management: A Key to Success” of T. Lam, says that the ability to manage your time effectively can benefit you in many ways: increased productivity and efficiency, decreased stress, greater opportunities to achieve important life and career goals, more time where it matters, and a dependable and professional reputation.

Time is a major resource in learning, the way in which people perceive and invest time reflects on learning results. The evolution of beliefs regarding time organization (Covey, 1998) recorded four distinct generations, characterized as follows: keeping records through notes and lists; trying to look to the future through indexes, tables and agenda; setting priorities and planning through objectives; moving interest center from time to maintaining balance between production and production capacity (according to urgency and importance). Time management is an ability that can be developed at any age, if the person desires to improve the results of his actions (Dale, 1993). Previous research (Magher, 2005) shows that students are much more motivated if they can solve the task in a personal rhythm. Students should be aware of the hours of maximum effort and should adapt their personal rhythm to circadian and ultradian rhythm (Clinciu et al., 2005). Circadian rhythm is a result of light-dark alternation. Circadian rhythms repeat cyclic at every 24 hours, the duration of each component (light and dark) varies as a function of Earth position to the Sun. Most physiological processes relate to these rhythms. Each day, at regular periods, the human body needs food, sleep, activity, lack of activity, energy.

Another article by Bartleby (2018), Grade Point Average (GPA) is directly influenced by time management skills by the student. The authors further propose that students' ability to effectively manage their greatly correlates to academic achievement. They claim that students with good time management skills are better placed at achieving their academic aspirations and experience less stress as far as their academic life is concerned.

This could point an important implication that senior high school administrators may want to improve the curriculum of the senior high school by assessing how students feel and give importance to the Work Immersion program of the educational sector. Regardless of the students' age, employment status, school attended, financial sponsors, and the like, results revealed that Work Immersion plays a vital role to students' readiness to college and career. Also, it prepares students to be more mature and responsible enough with life after senior high school which is the main purpose of the said program.

Conclusion and Recommendations

Much more detailed evaluation work could be done to provide a detailed picture of the strengths and weaknesses of implementation. Work Immersion Internship program is considered to be one of the most effective ways to enhance students' skills in their chosen field of specialization. The said learning experience students can get from 80 hours of work immersion will surely enable and help students familiarize themselves with the workplace. This workplace simulation experience will enable them to apply their competencies in areas of specialization. Such experience is advantageous to students who want to experience and learn more about the life of being employed. It equips them with relevant skills; hence, prepares them for the bigger world after graduation.

Summary

The study aimed to determine the importance of the Work Immersion subject for senior high school students to be ready and equipped with the proper tools and attributes to enter college and/or employment. The independent variables were the respondents' profiles such as sex, age, course, previous school, grade in work immersion, employment status, financial sponsors, scholarship availed, and the self-efficacy test which details the respondents' learning experiences and outcomes, college experiences, and college and career planning. The dependent variables were components of the four keys to college and career readiness. The study subsequently addressed the four questions. (1) What is the demographic profile of the respondents? (2) What is the level of college and career readiness of the students? In terms of; (a) Learning experiences, (b) Learning Outcomes, (c) College Experiences, (d) College and career Planning, (3) What is the relevance of work immersion program? (4) What are the challenges encountered in the work immersion?

The results provided evidence on interactions and learning experiences, contributing to the engagement in, and development of cognitive strategies, content knowledge, learning skills, and transition knowledge associated with CCR (R. Lent & Brown, 2013). All the respondents described how their interactions with family, friends, and mentors contributed to their CCR development. Of Conley's (2014) Four Keys to CCR, respondents described situations where adult interactions supported engagement with learning skills and transition knowledge. Whereas, learning experiences tended to support engagement in cognitive strategies and content knowledge.

The study utilized both qualitative and quantitative research designs using survey questionnaire for each of the independent and dependent variables. The statistical treatments used were the frequency and percentages count, computation of means and standard deviation for establishing the impact of the independent variables on the dependent variables.

Findings

The findings of the study are summarized as follows:

a. For the demographics:

   i. Majority of the respondents are female students with a mean average of 76.44 percent of the total respondents.

ii. Majority of the respondents are 18 – 19 years old. Most of them are at the right age to be a college freshman.
iii. Many of them are students taking Bachelor of Science in Accountancy under the College of Business and Accountancy with sixty (62) enrolled respondents. Followed by Bachelor of Science in Business Administration with forty-eight (48) students enrolled out from the respondents.
iv. Majority of the respondents were graduates of Liceo de Cagayan University during their senior high school.
v. Majority of the respondents has an average grade of 91 – 95 on their Work Immersion.
vi. All of the respondents are not working while studying in college. Most of them are sponsored by their families and thru scholarship program.

b) For the second research question:
   i. Respondents were satisfied with the learning experiences, learning outcomes, college experiences, and college and career planning they have undergone and/or improved during and after their work immersion in senior high school and even during their college experiences.
   ii. Majority of the respondents first received advice about what course to take in college was during their grade 12.
   iii. Majority of the respondents said that their parents are the ones who first gave them the knowledge about college admission and discussed career plans.

c) For the third research question:
   i. Majority of the respondents said that the work immersion is relevant to their college life for today as they were able to apply those experiences they have gained or learned from their respective companies

d) For the fourth research question:
   i. Majority of the respondents said that the challenges they have encountered during their Work Immersion are time management and adjustment with work.

Conclusions

The respondents in this study emphasized how adult interactions influenced their career identities and decision making. It is also known that learning experiences, learning outcomes, college experiences, and college and career planning contribute to how an individual builds self-efficacy skills, and how they set individual career goals and outcomes for themselves. It is known that students engage with career identity, self-awareness, and build self-efficacy skills through interactions and associations with those around them, particularly adults (Lent & Brown, 2013).

The statements of the respondents on the relevance of Work Immersion to their college and career goals revealed that most of the respondents mentioned that the work immersion is relevant to their college life for today as they were able to apply those experiences they have gained or learned from their respective companies. Students are very thankful in experiencing those activities which helped them be prepared to enter college and even in future career.

Respondents also revealed “lack of knowledge on what to do”, “adjustment period”, “being challenged or pressured”, and the like. Despite of having hard time dealing with deadlines, whether in work or in academics, they still tried their best to overcome and able to handle stress. The respondents in this study indicated gaps in transitional skills and knowledge upon senior high school graduation. A more effective college and career ready program would ensure adult mentors are knowledgeable in career pathways and outcomes, and that learning experiences that provide reflection on career pathways and outcomes should be carried out across the educational system and curriculum (Haase, Poulin, & Heckhausen, 2012)

Recommendations

The findings, conclusions, and implications of this study summed up some key points to be carried out for future use. Here are the following recommendations:

The first recommendation is for educator, parent, and community career awareness programs to be put in place to connect all stakeholders to changes in economic and workforce demands, as well as options for postsecondary pathways that would lead to realistic career opportunities based on workforce needs. Based on the evidence of the study, and current literature on college and career readiness and workforce development, it is recommended parental support groups such as parent-teacher associations and parent teacher organizations should also be provided with similar learning opportunities. Guiding students for academic success alone, and a mentality that one must go to college to be successful must change to better guide children to make connections between their interests, abilities, and realistic postsecondary and workforce options (Fleming, 2016). Results also emphasize that schools must deploy students according to their field or focus of study which would commend them more to their expertise. All children deserve an education that prepares them for their future, in the workforce of their time. Lastly, all children should be afforded with college and career opportunities regardless of their economic standing.
The second recommendation is for secondary schools to provide college and career exploration opportunities for all children so that every child can build a better understanding of post-secondary pathways and transitional knowledge. Evidence from this study resulted in the recommendation that workforce connections be built into the general education curriculum so that students can reflect on individual interests and abilities as they relate to content material and its connection to workforce needs.

The third recommendation is to build workforce connections into the general education curriculum so that students can reflect on individual interests and abilities as they relate to content material and its connection to workforce needs. Student learning experiences should not solely be focused on academic content. Instead, academic content must connect with realistic career outcomes to provide children with connections to career identities, interests, and abilities across the curriculum (Fleming, 2016).

Acknowledgment

The researcher would like to acknowledge the people in the process of making this manuscript. The success of this paper would not be possible without their encouragement and help support.

To the dean of graduate studies, Dr. Ma. Chona V. Palomares, for the brilliant ideas that has led the researcher to finalize on this study and to the adviser, Dr. Teresita T. Tumapon, who continually positively conveyed a spirit of adventure in regard to research. Without their guidance and persistent help, this thesis would not have been promising and successful.

To express utmost gratitude for the unconditional love of the researcher's family, to his mom, Mrs. Veronica A. Millare, as a great influence to do research. To his dad, M.Sgt. Rodolfo B. Millare (Ret) as well as his siblings.

To his students, officemates, friends, and loved ones for their undying support and love.

Above all, to almighty God for His mercy and unconditional love that made all of the impossible things happen.

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Strategic Management Practices and Business Performance of Cooperatives in Ifugao, Philippines: Basis for Strategic Planning Model

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Abstract - Multi-purpose cooperatives need to operate and effectively focus their efforts on certain tasks to avoid getting astray or deviate from their targets. As required of all well-managed organization, the right external and internal environment with the right people in it is essential for a cooperative organization to accomplish its objectives, a sense of direction needs to be set and some sort of rules or guidelines have to be established and observed. This research aims to examine the effect of strategic management practices on the business performance of selected multi-purpose cooperatives in Ifugao. Specifically, it seeks to measure the level of application of strategic management tasks by these cooperatives and correlate it with its financial and operational performance as a basis for a strategic planning model. This study utilized primary and secondary data. To assess the relationship between strategic management and financial and operational performance, the researcher used simple regression analysis. Result of the study showed a positive relationship between strategic management and financial performance which is supported by the analysis made on the financial statements of the cooperative which shows an increasing trend on the net profit margin, ROA and ROE. A positive relationship also occurs between strategic management and operational performance of the multi-purpose cooperatives in Ifugao.

Keywords - Competitive Advantage, Financial Performance, Operational Performance, Planning Model, Strategic Management

Introduction

Since early times of Human History, primitive man was already involved in cooperative effort which is necessary to accomplish a common purpose such as providing security for a group of people or to collectively undertake a complex project. The building of the Banaue Rice Terraces in Ifugao is one of the most symbolic evidences of Cooperative Movement in the Philippines.

Cooperation is considered as one of the best possible alternative to a business entity to help promote economic and social stability. Cooperation is a method in life that seeks to find solutions to humans many socio-economic problems. Simple forms of cooperation involved individuals in the community who organize themselves to pool financial or material resources with the common objectives of generating income and distributing the same among themselves. Other forms of cooperation includes farmers or stakeholders who contributed money and effort to purchase or build facilities for the common use of the members (Masuku, Masuku, & Mutangira, 2016).

The International Labour Organization defines a Cooperative as "an association of persons who have voluntarily joined together to achieve a common end through the formation of a democratically controlled organization, making equitable contributions to the capital required and accepting a fair share of the risks and benefits of the undertaking in which the members actively participate." The primary objective of every cooperative, according to the Cooperative code of the Philippines, is to provide goods and services to its members and thus enable them to attain increased income and savings, investments, productivity, and purchasing power and promote among themselves equitable distribution of net surplus. A cooperative shall provide maximum economic benefits to its members, teach them the efficient ways of doing things and new ideas in business and management allows the lower income groups to increase their assets and net worth (Art. 7, Philippine Cooperative Code of 2008).

There are six main types of cooperatives in the Philippines as provided in Article 23 of the Philippine Cooperative Code: 1) the Credit Cooperatives; 2) Consumers Cooperative; 3) Producers Cooperative; 4) Marketing Cooperatives; 5) Service Cooperative and 6) Multi-purpose Cooperatives.

In the Philippines, Lab-oyen (2018) identified some issues and challenges encountered by micro and small cooperatives. One factor is that small and micro cooperatives have limited capital for operations. Aside from that, cooperatives who wish to augment their limited resources may embark on savings and time deposit but cannot do so because the law provides that it is for specific purpose in accordance with the provisions of the articles of cooperative and by-laws otherwise the unrelated earnings can be considered taxable. Furthermore, Lab-oyen (2018) acknowledged the lack of knowledge of employees on management functions and stressed the need for assistance of these cooperatives to be able to comply with the Cooperative Development Authority (CDA) requirements.

The Cooperative Development Authority is the government agency tasked to carry out the provisions of the Cooperative Code of the Philippines. CDA was created to boost the establishment and development of cooperative as instruments of equity, social justice and economic development.

Sustainability of these cooperatives depends upon the proper understanding and management of what cooperatives are organized for and the concept of strategic management has proven its importance in the success of any enterprise (Fratz et.al., 2017). Monday, et.al (2015) states that for an organization to compete successfully, management need to make strategic plans and take strategic actions to gain competitive advantage and enhance performance relative to competitors.

Cooperatives and investor-owned firms (IOFs) alike are facing intensified competition. This places increasing demand on strategic management aside from high performing governance. A good board is key to strategic management activity since they are the ones who have to decide about strategies and dynamic top management is needed to implement strategic management practices (Hakelius, 2018).

Strategic management can depend upon the size of an organization, and the proclivity to change of its business environment, a global transnational organization may employ a more structured strategic management model due to its size, scope of operations and the need to encompass stakeholder views and requirements (Maugbo, 2013).

The strategic management of people, processes and decisions is vital to the success of any venture regardless of its goals, scope, industry or location. Effective management is necessary for the project's to be realized and its goals to be met. In order to improve the prospect of achieving desired results, management must address strategic management challenges the best way possible (Ramirez, 2014). On the other hand, Crab (2012) correlated sustainable strategic management practices with market effectiveness, for an organization to be effective with it ventures, a systematic framework needs to be developed, workers participation and integrity is highly required.

According to Dogan (2015), strategic management practices is needed both by new enterprises and long-established companies desiring to have competitive advantage today and tomorrow. They must learn how to integrate entrepreneurship with strategic management, and must apply strategic entrepreneurship daily.

Literature on management of cooperatives includes many articles dealing with business performance, most of which aimed at evaluating the financial performance and member's satisfaction of these cooperatives as well as showing the relationship of factors like financial resources, government support, board capability, internal control and transparency to business performance (e.g. Chareonwongsak, 2017; El-dalabeeh, 2013; Chander & Chandel, 2010; Ibitoye, 2012; Mathuva & Kiweu, 2016).

In the last decade, a lot of literature on strategic management practices has been made focusing on the needs of SME but, little attention has been given to know the extent of adoption and effect of strategic management on cooperatives (e.g. Mahazril, 2012; Marwa, 2015) Empirical literature on the relationship of strategic management with performance of cooperatives in the Philippines is scanty and no study was undertaken so far at regional level.

It is for this fact that the researcher is motivated to undertake this study to find answer whether these cooperatives have adopted and implemented strategic management practices and if this has significant effect to their business performance, especially on the financial aspect because it is the primary motivator for an individual to become a member of a cooperative.

Significance of the Study

In a developing country like the Philippines, what constitute most of the population are the poor who are always excluded to mainstream banking. To bridge the gap, the government hereby declared the policy of the state to promote the viability and growth of cooperatives as instruments of equity, social justice and economic development (Section 1, RA 6939). While the surge of cooperatives in the rural areas has been unprecedented, the factors that led to their performance and growth still is a contentious debate.

The method of measuring business performance according to Omsa, et. al., (2017) can be divided into two types: Objective and subjective measurement. Objective measurement includes profit margin, sales volume, return on investments, and inventory turnover whose data can be analyzed from the financial statements such as the balance sheet and income statement. While the subjective measure rely on the perception of the managers or owners with regards to business performance achieved like customer satisfaction and increase in members or clients.

According to Yuvaragi and Biruk (2013), the financial health of cooperatives can be determined through its financial statements by examining the relationships of the different figures stated therein and make comparisons with other relevant information. The results can be a valuable tool for the members, non-members and other clients of the cooperatives in their decision-making process related to their transactions with the cooperatives.

This study hopes to contribute not only in addition to literature but also to be of help to the management of the cooperatives to suggest strategies that would be of great help towards a positive business performance. Moreover, this study will be serving as a reference material for both academicians and practitioners.

Related Literature

Strategic Management and Cooperatives

A business organization can measure its performance using the financial and non-financial measures. The financial measures includes profit margin, return on assets, return on investment or sales while the non-financial measures relates to the operational performance of the business and it focuses on issues pertaining to customer satisfaction, customers referral rates, waiting and delivery time as well as employees turn over (Monday, 2015). A survey conducted by Adams and Graham (2016) among 499 business managers shows that firms can enhance corporate performance with their ability to integrate internal and external resources, this enhances the value of integration and knowledge creation as means of achieving firm's performance.

In Japan, Nakayama (2018) examines the usage of different strategic tools which is considered to have influenced organizational performance and found out that companies in Japan employed two or more strategic tools in their business, this shows that Japanese companies are aware on the effectiveness of these tools for a positive business return.

Bouker Maroua (2015) in his investigation of cooperative banks in Tunisia concluded that the performance of cooperatives is attributed to the increase in ratio of accession and good governance of these cooperatives. This study was supported by Karin Hakelius (2018) which gathered and examined empirical evidences concerning the extent to which the performance of cooperatives is related to the composition of their board and interaction patterns. As supported by the data, the overall performance of cooperatives was higher if the board was larger, well-educated and had consensus between the directors and the CEO. Slavik, Putnova & Cebakova (2015) concluded also in their study that leadership is a participatory factor to economic success of corporations and is an effective tool to strategic management.

In Pakistan, government and state banks has been giving their full support to develop the SME and non-government organization but there is always the gap for further improvement. Jasra, et. al., (2011) shed light on these gap by investigating some determinants to business success. Research showed that strategic management is one of the contributory factors to the success of an enterprise aside from financial resources, government support and entrepreneurial skills among others.

Dr. Beatriz Onate (2015), studied the performance of an Agrarian multi-purpose cooperatives in the Philippines correlating profit with capability. Results showed that cooperatives with good profit margin possess the organization enterprise capabilities.

Strategic management practice and business performance

Strategic management practices has been observed to significantly relate to the sustainability and growth of firms in the wake of modern corporate governance systems globally (Muriuki, et.al., 2017). In Pakistan, A study of three selected tertiary health care center was carried out by Khan & Huda (2016) to establish the influence of strategic management practices on competition and organizational performance, responses showed a positive effect on the competition level and overall performance of these health care centers.

In a survey conducted by Dr. Fakher Jaqua (2014) among 276 Tunisian companies involved in modernization program called “upgrade program” shows that strategic management is an undeniable reality in enhancing performance of enterprises because majority of the companies has incorporated these concepts to achieve competitive advantage.

Omsa, Ridwan & Jayadi (2018) in their study on the effect of strategic management practices on SME performances in Makassar, Indonesia, shows that strategic management practices are essential in achieving sales volume, accelerating of break-even point achievement and attaining target profit. This analysis was supported by Anna Witek-Crabb after examining 150 public companies in Poland found out that Strategic Management practices and market effectiveness has a significant positive correlation, this means that companies with more sustainable strategic management practices are more effective in the market (Crabb, 2012).

Dauda, Akindbade and Akinlabi (2010) examine the influence of strategic management on corporate performance in selected small scale enterprises in Lagos, Nigeria. Cross-sectional survey research method was adopted for the study and 140 participants randomly selected among small-scale enterprises in Lagos metropolis. Findings of the study show that strategic management enhances both organizational profitability and company market share.

In Nigeria, Maugbo (2013) examines the impact of strategic management on organizational growth and development in selected manufacturing firms in Anambra state. The study uses a descriptive survey design to collect detailed and factual information. Cluster sampling was used to select equal number of manufacturing firms and with the aid of a structured questionnaire, he found out that strategic management practices is not yet a common business practice in Anambra state but it has been identified as a veritable tool for improving the competitiveness and enhancing performance level of manufacturing firms.

A longitudinal study among Austrian SMEs confirmed that a combination of strategies used by owners is advantageous for enterprises based in a highly industrialized countries. Combination of these strategies positively influenced all three performance indicators: profitability, employment growth and turnover growth (Leitner & Guldenberg, 2010). The presence of a good strategic plans helps in many ways in making business resilient to the unpredictable business environment (Agwu, 2018).

Sang Chul Jung (2014), in his study on the strategic management practices of Samsung Electronics found out that Samsung electronics uses a number of the generic value chain model in creating a shared vision, establishing a performance-based personnel management system, technology development and cost control procedures. Result showed that the success of the company is attributed to leadership, standardization of management system, commitment of innovative strategies and training, and partnership with value chain experts.

In Kenya, Lilingu, Marangu & Masungo (2015) conducted a study on the effect of strategic planning on the performance of 33 credit co-operative societies in Kakamega County. To establish the relationship between strategic planning and organizational performance, the researcher used simple regression analysis. Result showed that strategic planning affects the SACCOs performance positively thus, the researchers recommends to the managers to strictly maintain the strategic management tasks that positively related to organizational performance.

Waweru and Omwenga (2015) has the same result with their study on the influence of strategic management practices on 68 private firms in Kenya. It shows that the use of strategic management practice ensures that the holistic view of performance is pegged on strategic planning, strategic choice and strategic implementation and does not merely concentrate on measure of success on the traditional pillars of cost, quality and time.

Theoretical Framework

Various strategic management theories has proven their worth as key drivers in the success of enterprises constantly reminding business managers in addressing the challenges of competition in the business world. A lot of authors also have propounded a variety of models to put forward the idea of strategic management. Among these theories and models are the following:

Michael Porter's Theory of Competitive Advantage
There is no question that Michael Porter has made substantial contribution in the field of strategic management through his Five Forces Competition Model otherwise known as Porter's Theory of Competitive Advantage (figure 1). It was introduced in 1980 and since then became a popular theory in business management in general and in the field of strategic management in particular. The theory advocates that other than competition itself among firms selling or producing the same product or services in the market, there are other forces that drives business competition. The force of these factors is so strong that it justified the need for strategic management. This model consist only of five major forces hence, it is called Porter's five forces model (Orcullo, 2007).

Figure 1. Porter's five forces model of competition
(Source: Adapted from Orcullo, 2007 p. 49)

Resource-based Theory

The Resource-based theory was developed by Birge Wenefeldt in 1984, this theory asserts that the source of an organization's competitive advantage depends on the endowments of its resources. The underlying premise of this Theory is that firms differ in fundamental ways because each firm possess a unique bundle of resources, these firms develops competencies from these resources, and when developed especially well, these becomes the source of the firm's competitive advantage (Pierson and Robinson, 2007).

The resource-based approach stipulates that the fundamental sources and drivers of a firm's competitive advantage and their superior performance are mainly associated with the attributes of their resources and capabilities (Peteraf and Bergen, 2003).

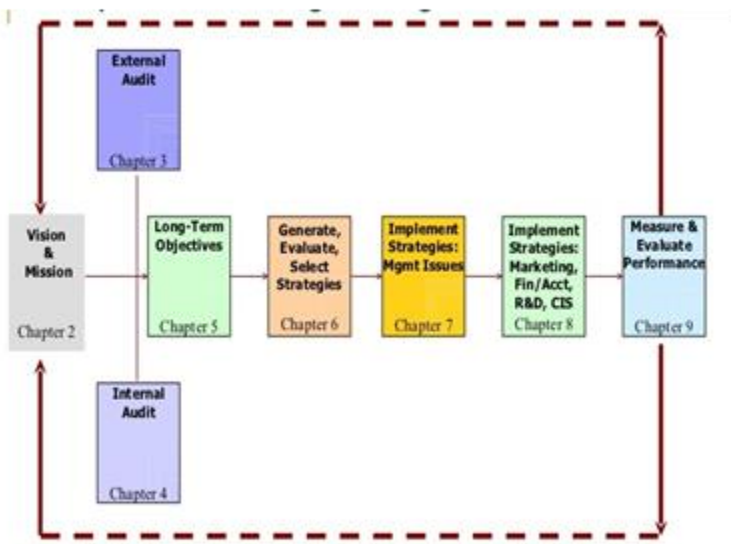

Figure 2. Comprehensive Strategic Management Model
(Source: Fred R. David, 2007 p. 15)

Fred R. David Comprehensive Strategic Management Model. Identifying an organization's vision and mission statements is the starting point of the comprehensive strategic management model (Figure 2) espoused by Fred R. David. This model identified a series of six management tasks which starts with developing mission and vision statement followed by establishing long term objectives as the second task. The third task is to generate, evaluate and select strategies followed by the implementation of these strategies looking at management and operations issues as the fourth task and implementing strategies looking marketing, finance/accounting, R&D, and MIS issues as the fifth task. The last task or sixth task is measuring and evaluating the performance. What is unique in this model is the conduct of external and internal audit after developing mission statement and before developing long-term objectives.

According to Fred R. David, no organization has unlimited resources and no firm can take unlimited debt or issue unlimited stock to raise capital. Most organizations recognize that strategic management concepts and techniques can enhance the effectiveness of decisions.

Objectives of the Study

The aim of this study is to examine the effect of strategic management practice on the financial and operational performance of selected multi-purpose cooperatives in Ifugao. Specifically, it seeks to know the following:

1. To determine the profile of respondents cooperatives;
2. To determine the level of application of strategic management tasks by the respondent cooperatives in terms of:
   2.1 Setting of Vision, Mission and Goals
   2.2 Strategy formulation
   2.3 Environmental Scanning
   2.4 Monitoring and evaluation of performance
   2.5 Conduct of internal and external audit
3. To assess the relationship of strategic management practices with:
   3.1 Financial performance of the cooperatives
   3.2 Operational performance of the cooperatives;

Null hypotheses:

Ho1: There is no significant difference on the profile of respondents cooperatives;
Ho2: There is no significant difference on the level of application of strategic management practices in terms of:

Ho2.1: Setting Vision, Mission and Goals
Ho2.2: Strategy formulation
Ho2.3: Environmental Scanning
Ho2.4: Monitoring and evaluation of performance
Ho2.5: Conduct of internal and external audit

Ho3: There is no significant relationship between strategic management practices and financial performance; and

Ho4: There is no significant relationship between strategic management practice and operational performance of the multi-purpose cooperatives.

Methodology

Research Design

This is a descriptive correlational study designed to examine the relationship between strategic management practices with that of financial performance and non-financial/operational performance of selected multi-purpose cooperatives. This involves gathering primary and secondary data (financial statements of the respondent cooperatives) and then organizes, tabulates, and describe the data collection (Glass & Hopkins, 1984); and transform the data into a form that will make it easy to understand and interpret, this will need re-arranging, ordering and manipulating the data to generate descriptive information (Zikmund, 2003).

Subjects and Study Site

The purposive sampling is used to recruit participants based on the characteristics and objective of the study. This research wishes to examine the effect of strategic management on the financial and operational performance of multi-purpose cooperatives in Ifugao. Although there are 33 cooperatives registered with the Cooperative Development Authority (CDA), the researcher involved 17 multi-purpose cooperatives only based on the following criteria:

1. The multi-purpose cooperatives should have strategic management practices,
2. The cooperative should have complete books of accounts which is necessary to measure the financial performance, and
3. The cooperative has a physical body which means that it should have an office and a functional organizational structure.

The researcher then eliminates the 16 cooperatives that do not possess the criteria required to carry out this study.

Research Instrument

This study utilized both secondary and primary data. A structured questionnaire was prepared for the collection of primary data. The questionnaire constructs were formulated in the form of statements to which the respondent may react by marking their answers on a 5-point Likert scale. The questionnaire has three parts, the first part deals with the profile of the manager and the cooperative while the second part focuses on the level of adoption and implementation of strategic management tasks/practices by the cooperatives. The third part aims to measure the effect of strategic management practices on the financial and operational performance of the cooperatives.

To measure the internal consistency and reliability of these instrument, the Cronbach Alpha was used. The result of the reliability test showed that the 10 questions used to measure the level of adoption and implementation of strategic management practice is reliable because the computed Cronbach alpha value is .93. The questions which aims to measure the effect of strategic management practice on the financial and operational performance of the cooperative is also reliable because the cronbach alpha result is .92. Hence, the questionnaire used in this study can be considered as a reliable instrument for measuring the objective of the study.

The secondary data used for this study to measure the financial performance of the cooperatives is their financial statement that came from their balance sheets and income statements for the past five years. Financial performance were measured using selected financial analysis tools like profit margin, return on assets, and return on equity, and current ratio or the acid test ratio for the liquidity.

Data Gathering Procedure

The researcher have informed the respondents by sending in advance a request letter asking permission for them to accomplish the structured questionnaire and get permission also to obtain a copy of their financial statements if possible five years back. The data collected was classified, tabulated and analyzed as per objective of the study.

Permission to use the different financial data from these cooperatives were sought by sending a request letter addressed to the Chief Executive Officer. The request was approved and so the proponent have given the questionnaire to the respondents and retrieved the same after a week. Data obtained from them was treated with utmost confidentiality and strictly used for this research.

Data Analysis

Data gathered was coded, summarized and tabulated to assist in the analysis. The results then were presented as per objective of the study:

To measure the first objective which is the profile of respondent cooperative, the descriptive statistics like frequency, means and percentages was used.

In order to examine the level of adoption and implementation of strategic management practices by the cooperative and its effect on the financial and operational performance, the respondents were asks how strongly they agree or disagree with the following statement regarding strategic management. Again, Result was treated using frequency, percentages and cumulative percentages.

To assess the effect of strategic management practices on financial and operational performance of the cooperative, the study has set these null hypotheses:

Ho3 states that there is no significant relationship between strategic management practices and financial performance; and Ho4 states that no significant relationship also exist between strategic management and operational performance. The regression coefficient (beta β) is used to test the hypothesis with the test criteria that the study should reject the null hypothesis if p-value ≤ α, otherwise fail to reject Ho if p-value > α. The F-test was administered to determine the indication and overall significance of the relationships of variables.

Results and Discussions

The primary objective of the study is to examine the effect of strategic management practice on the financial and operational performance of cooperatives specifically their level of application on the different management tasks as follows:

a) Setting of Vision, mission and goals
b) Strategy formulation
c) Environmental scanning
d) Monitoring and evaluation of performance
e) Conduct of internal and external audit

The questionnaire has three parts, the first part deals with the profile of the general manager or chief executive office while the second part focuses on the level of adoption and implementation of strategic management tasks/practices. The third part aims to measure the effect of strategic management practice on the financial and operational performance of the cooperatives.

1A. Profile of the Chief Executive Officer or the General Manager

Table 1a shows that more than 52% of the Chief Executive Officers or the General Managers of the respondent-cooperatives were between 41 to 50 years of age and 5.56% are above 55 years old. This means that most of them are matured enough to handle a cooperative.

In terms of Educational attainment, 41.67% of the managers are Master's degree holder and 58.33% are bachelor's degree holder. This shows that the cooperatives are headed by educated individuals who can understand the need to adopt strategies as part of their management functions.

As to their number of working experience in the cooperatives, only one is a baby or new to its organization however most of them have spent their lives serving the cooperatives for more than 11 years which is an important contributory factor in the efficient management of an organization.

Table 1a. Profile of the Chief Executive Office, Chief Operations Officer and/or General Manager of the Cooperative

Manager's Profile		Frequency	Percent
Age	25-30	1	2.77
	31-35	5	13.9
	36-40	6	11.11
	41-50	12	52.77
	Above 55	2	16.67
Total		36	100%
Highest Educational Attainment	Diploma/undergraduate	0	0
	Bachelor's degree	21	58.33
	Master's Degree	15	41.67
	Doctorate	0	0
Total		36	100%
No. of Years in Service	1-5 years	1	2.77
	6-10 years	7	19.44
	11-15 years	14	38.89
	16-20 years	8	22.22
	20 years and above	6	16.67
Total		36	100%

1B. Profile of the Cooperatives

There are 17 multi-purpose cooperatives included in the study, 5 of which have more than three branches within and outside Ifugao and nine of them are operating within a single area only. As to their length of operation, all of them has been in operation for more than 10 years where in 17.6% or 3 out of 17 are operating for more than 30 years.

As to number of employees, table below shows that multi-purpose cooperatives in Ifugao belong to the micro, small and medium size enterprises because the number of workers employed are fewer than 100.

Table 1b. Frequency and percent distribution of profile of the cooperatives

Cooperative Profile		Frequency	Percent
Number of Branches	None	9	52.9
	1	2	11.8
	2	0	0
	3	1	5.9
	More than 3	5	29.4
Total		17	
Length of Operation	1-10 years	0	0
	11-20 years	8	47.1
	21-30 years	6	35.3
	31-40 years	3	17.6
	Above 40 years	0	0
Total		17	
Number of Employees	1-20 employees	9	52.9
	21-40 employees	1	5.9
	41-75 employees	3	17.6
	76-100employees	4	23.5
	Above 100 employees	0	0
Total		17	100%
Number of Members	100-1,000	0	0
	1,001-2,000	2	11.8
	2,001-5,000	7	41.18
	5,001-10,000	6	35.3
	Above 10,000	2	11.8
Total		17	100%

2. Strategic Management Practices of the Cooperatives

2.1 Establishment of Vision, Mission, Goals and Objectives of the Cooperatives

In order to assess how clearly the cooperative set up its vision, mission, goals and objectives, respondents are tasked to answer how strongly they agree or disagree with the following statements presented in table 3. For the establishment of clear mission and vision statement, it has a mean of 4.67 and 4.63 respectively which means that the respondent cooperatives strongly agree that setting up a clear vision and mission statements is important to the cooperative. On the other hand, the level of adoption of cooperatives on the establishment of a clear strategic goals and objectives; and a regular planning session has garnered a mean score of 4.46 and 4.27 respectively. This clearly shows that management found it significant in the life of a cooperative to have a regular planning session and a clear goals and objectives.

Table 2.1. Clear Vision, Mission, Goals and Objectives of the Cooperatives

Strategic management practice	Mean	SD	QD
The organization has a clear Mission statement	4.67	.433	Strongly agree
The organization has a clear Vision statement	4.63	.556	Strongly agree
The organization has clear strategic goals and objectives	4.46	.537	Agree
The organization has a regular planning session	4.27	.511	Agree
Average Mean	4.51		Strongly agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree;3.51-4.50 – Agree; 4.51-5.00 – strongly agree

2.2 Strategy formulation

To assess if the cooperative adopted various strategies, respondents are tasked to identify their level of adoption of the different strategies presented in table 2.2a. All Seven items were rated with mean scores from 3.51-4.50 described as agree where customer service has the highest mean score of 4.20. This implies that cooperative services is a priority when it comes to crafting of strategies. This is in line with the principles of Marwa & Aziakpono (2015) that the welfare of the members should come first because they are the lifeblood of cooperatives wherein the bulk of revenue of the organization comes from them.

To establish how strategies are formulated by the cooperative and where does the strategy came from, respondents were required to give their views regarding the involvement of the different level of management in strategy formulation. There are four items in table 2.2b that pertains to strategy formulation and the mean scores are 2.80, 3.06, 3.33 and 3.50, which is described as Fairly agree. This shows that crafting of strategies may be done at times by the top management alone and/or with senior and division management and sometimes with the participation of the whole organization. Takeshi Nakayama (2018), in his study of Japanese companies suggest that managers and supervisors needs to be interested in and should be fully familiar with various strategic management tools and knows how to use them appropriately. The study found out that managers who practice two or more strategies are likely to succeed than those who adopts one strategy only.

Table 2.2a. Various strategies adopted by the cooperative

Strategic management practice	Mean	SD	QD
a) Market Strategy	3.77	.614	Agree
b) Product strategy	3.57	.590	Agree
c) Customer differentiation	3.80	.568	Agree
d) Pricing differentiation	3.93	.581	Agree
e) Cost control policy	3.83	.654	Agree
f) Customer service	4.20	.547	Agree
g) Advertising	3.87	.576	Agree
Average Mean	3.85		Agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree;3.51-4.50 – Agree; 4.51-5.00 – strongly agree

Table 2.2b. Crafting of strategies

Strategic management practice	Mean	SD	QD
a) Top Management only	2.80	.496	Fairly agree
b) Top and senior management	3.06	.641	Fairly agree
c) Top, senior and division management	3.33	.512	Fairly agree
d) Top to bottom management	3.50	.518	Fairly agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree; 3.51-4.50 – Agree; 4.51-5.00 – strongly agree

2.3 Environmental Analysis

Table 2.3a shows the different external environment considered by cooperative before they craft strategies. Competition ranked first because it has a mean score of 4.10 followed by technology, political factor, social and economic factor with score means of 3.6, 2.53, 3.3 and 3.27 respectively. This means that the strategies formulated by these cooperative were driven most by competition and less by political factor.

As to analysis of internal environment (table 2.3b), result shows an average mean score of 3.77 which means that respondent cooperatives agree that they conduct internal environment analysis before crafting strategies wherein the community is their foremost consideration which has a mean score of 4.77 described as strongly agree. Other consideration are stakeholder, supplier and clients with mean scores of 3.73, 3.63 and 3.53 respectively.

Table 2.3a. Analysis of External Environment

Strategic management practice	Mean	SD	QD
a) Political	2.53	.486	Fair
b) Economic	3.27	.516	Fair
c) Social	3.3	.581	Fair
d) Technology	3.6	.624	Agree
e) Competition	4.10	.592	Agree
Average Mean	3.36		Fair

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree; 3.51-4.50 – Agree; 4.51-5.00 – strongly agree

Table 2.3b. Analysis of Internal Environment

Strategic management practice	Mean	SD	QD
a) Government	3.20	.486	Fair
b) Culture	3.40	.542	Fair
c) Stakeholders	3.73	.512	Agree
d) Suppliers	3.63	.556	Agree
e) Clients/customer	3.53	.541	Agree
f) Community	4.77	.634	Strongly Agree
Average Mean	3.71		Agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree;

2.4 Monitoring and Control

To measure if the cooperative monitors the performance of the organization and has a regular internal and external audit, result shows that the respondents strongly agree that they conduct monitoring of performance of the cooperatives and instituted a regular external and internal audit because it has an average mean of 4.76 and 4.83 respectively described as strongly agree.

Table 2.4. Monitoring and Control

Strategic management practice	Mean	SD	QD
a) The cooperative monitors the performance of the organization on a regular basis	4.76	.634	Strongly agree
b) A regular external and internal audit is instituted	4.83	.597	Strongly agree
Average Mean	4.79		Strongly agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree; 3.51-4.50 – Agree; 4.51-5.00 – strongly agree

3. Effect of strategic management practices on financial performance

To assess if strategic management practice has an effect on the financial performance of cooperative, respondents were asked to determine if strategic management has effect on the liquidity, profit margin, ROA, market share and sales of the cooperative. From the table below, cooperatives agreed that liquidity, ROA and profit margin is improved because of strategic management but they fairly agree on the effect of it on market share and increase in sales.

This result is supported by the analysis made on the financial statements of the multi-purpose cooperatives (see table 3b) which uses financial analysis tools like current ratio to measure liquidity, net profit margin, return on assets and return on equity to measure the overall profitability of the cooperative.

It is clearly shown in table 3b that the cooperative are liquid for the past five years because their computed current ratio is above one which means that the cooperatives are able to pay their obligations when it becomes due.

As to profitability, net profit margin shows that the cooperatives were able to earn income for the past five years and it is increasing overtime. According to S&P 500 index, the benchmark of the overall market, the industry standard for return on assets is 1%, 7% for return on equity and 11% for net profit margin. Table 4.3b shows that the cooperative under study surpassed these industry standards. The Net profit margin is very good because it ranges from 31 % to 38%, ROA ranges from 6% - 7.5% and ROE from 21% - 24%.

Table 3a. Effect of strategic management on financial performance

Strategic management practice	Mean	SD	QD
a) The cooperative has been liquid for the past 5 years	4.4	.432	Agree
b) The profit margin of the cooperative is increasing over time	4.23	.490	Agree
c) Return on assets is increasing	4.3	.543	Agree
d) Market share is increasing over time	2.6	.485	Fairly agree
e) There is remarkable increase on sales	2.67	.467	Fairly agree
Average Mean	3.64		Agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree; 3.51-4.50 – Agree; 4.51-5.00 – strongly agree

Table 3b. Financial performance analysis of MPC's from 2016-2020

Net profit margin	2016	2017	2018	2019	2020
Mean	0.31375	0.3118	0.3356	0.3493	0.3843
median	0.32	0.33	0.33	0.35	0.38
SD	0.0373	0.0418	0.0374	0.03629	0.0351
Min.	0.07	0.05	0.05	0.06	0.08
Max	0.59	0.59	0.57	0.56	0.57
Return on Assest	2014	2015	2016	2017	2018
Mean	0.06	0.054	0.06	0.065	0.075
median	0.05	0.05	0.05	0.06	0.06
SD	0.0374	0.032	0.0382	0.0527	0.0577
Min.	0	0	0	0	0
Max	0.14	0.13	0.15	0.2	0.23
Return on Equity	2014	2015	2016	2017	2018
Mean	0.211	0.177	0.195	0.208	0.245
median	0.15	0.15	0.16	0.15	0.18
SD	0.198	0.134	0.147	0.197	0.228
Min.	0.01	0.01	0.01	0.01	0.02
Max.	0.88	0.58	0.57	0.8	0.8
Current Ratio	2014	2015	2016	2017	2018
Mean	1.8	1.7	1.63	1.7	1.68
median	1.6	1.64	1.58	1.64	1.67
SD	0.885	0.475	0.317	0.356	0.296
Min.	1.13	1.24	1.23	1.21	1.2
Max.	4.88	2.9	2.49	2.49	2.44

4. Effect of strategic management practice on operational performance

To get the effect of strategic management practice on the operational performance of cooperatives. Respondents are asked to give their level of agreement to the five questions presented below. It can be deduced from the result that strategic management practices have a positive effect on the operational performance of cooperatives in Ifugao because it has an average mean score of 4.46. Respondents strongly agree that strategic management help improved the quality of products and services offered by the cooperatives and it brings in continuous patronage of members.

Table 4.4. Effect of strategic management practice on operational performance

Strategic management practice	Mean	SD	QD
a) It aids in the procurement of raw materials and timely delivery of products and services	4.43	.487	Agree
b) It aids in the utilization of human and material resources	4.23	.512	Agree
c) It brings about in the smooth operation of the different services	4.43	.535	Agree
d) Quality of products and services were improved	4.55	.523	Strongly Agree
e) There is continuous patronage and number of members are increasing	4.57	.511	Strongly Agree
f) Members and non-members are satisfied with the services of the cooperatives	4.57	.511	Strongly Agree
Average Mean	4.46		Agree

Scale: 1.00-1.50-strongly disagree; 1.51-2.50-disagree; 2.51-3.50 – Fairly agree; 3.51-4.50 – Agree; 4.51-5.00 – strongly agree

5. Inferential Analysis

To assess the effect of strategic management practices on the financial performance and operational performance of the cooperatives, the researcher used the regression coefficient (beta β) to test the hypothesis with the test criteria set that study should reject the null hypothesis Ho if the p-value is ≤α, otherwise fail to reject Ho if p=value >α. All the answers given by the respondents has scores which are scored marks according to the responses of the respondents. All responses pertaining to strategic management were summed up and finally divided by the number of items to get the mean score. The same procedure was repeated for other questions measuring the financial performance and operational performance. In order to test the hypothesis, the aggregate mean score of financial performance measures were regressed against the mean score of strategic management. Same procedure is done to test the relationship between strategic management and operational performance and results are shown in table 4.5a and 4.5b.

The regression result from the table below shows that there is a positive relationship between strategic management and financial performance (β =.632) and operational performance (β =.747). The relationship is statistically significant because the computed p-value is .000 for both financial and operational measures which is less than the set value of 0.05.

The study therefore rejects the null hypotheses and concludes that there is significant relationship between strategic management and financial performance and operational performance of the multi-purpose cooperatives in Ifugao. The result of the study shows that if the multi-purpose cooperatives adopts and implement strategic management practices in the management of the cooperatives, then their financial performance can improve by 63.2 percent and their operational performance improves by 74.7 percent. The practice therefore then of strategic management is a very big factor in the improvement of both financial and operational performance of the multi-purpose cooperatives.

Table 5a. Regression Analysis of Strategic management practices against financial performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.632[a]	.400	.383	.46570

a. Predictors: (Constant), Strategic Management practices

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig. (p-value)
1	Regression	5.060	1	5.060	23.333	.000[a]
	Residual	7.591	35	.217		
	Total	12.651	36			

a. Predictors: (Constant), strategic management

b. Dependent Variable: Financial performance (Liquidity, ROA, Sales)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.840	.709		1.186	.244
	VAR00003	.893	.185	.632	4.830	.000

a. Dependent Variable: financial performance

Table 5b. Result of regression of strategic management practices against operational performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.747[a]	.557	.545	.34459

a. Predictors: (Constant), Strategic Management practices

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig. (P-value)
1	Regression	5.234	1	5.234	44.082	.000[a]
	Residual	4.156	35	.119		
	Total	9.390	36			

a. Predictors: (Constant), strategic management

b. Dependent Variable: Operational performance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.755	.524		1.441	.159
	VAR00003	.908	.137	.747	6.639	.000

a. Dependent Variable: operational performance

Summary of Findings, Conclusion and Recommendations

Summary of findings

This study examines the impact of strategic management on the business performance of multi-purpose cooperatives in Ifugao. The survey strategy was adopted to collect data from these cooperatives with the aid of a structured questionnaire. There are 17 multi-purpose cooperative included in the study which are selected based on a criteria presented in chapter 3 of this study. The result of the study showed that the multi-purpose cooperative in Ifugao practiced strategic management in the operations of their business because they have set clear vision, mission, goals and objectives, crafted various strategies and implemented these strategies. The regression analysis showed also a positive relationship between strategic management and financial performance and operational performance and rejected the null hypotheses because of the computed p-value of .000 which is lower than the set value of 0.05. The study found that strategic management practices significantly and positively affects the financial and operational performance of the cooperatives. The result of this study goes with the study of Lilingu, Marangu & Masungo (2015) that studied the effect of strategic planning with the organizational performance of SACCO's in Kenya and found out the strategic planning has significantly affects the overall organizational performance of the SACCO's. Agwu (2018) also got the same result when he studied the impact of strategic management on the business performance of SME's in Nigeria and admitted the reality that strategic management is important in the life of every business entity.

Conclusion

Every organization, either private, public or people's organization like cooperatives must admit that adopting strategic management is indeed important for the improvement of business performance. Various studies recommends that all organization need not only define the vision, mission and goals of the organization but also diligently seek to apply numerous strategic management principles. This conclusion is in line with Dauda, Akingbade & Akinlabi (2010) which declares that the adoption of strategic management practice is indispensable in small and medium scale firms who are prone to bankruptcy and exposed to stiff competition. To be able to gain competitive advantage, the firms or organizations must look for a way to combat the ill effect of competition and adopting strategic management practice at different levels of the organization is of great help.

Recommendation

For strategic management practices to take effect and works best for the organization, the following are highly recommended:

1. When formulating strategies, General Managers or the Chief Executive Officers of the Cooperative should take into account all necessary steps required to come up with a sound and effective strategy.
2. Strategic management entails cost, general managers should then institute a process of deciding on the objectives and strategies of the organization and on the proper allocation of resources to attain the objective.
3. Developing and formulating of strategies should be a concern of everyone in the organization, Top management should develop an approach to get the best ideas from the organization.
4. For managers and for everyone in the business organization, decision making is a daily if not an all-the-time task or duty. Strategic decision are sometimes doubted and questioned because there are consideration that others need to be informed. The general manager should adopt approaches or modalities by which strategic decisions are made.
5. Board of directors should be involved in the policy and strategy development process of the cooperative especially with cooperatives where Board of directors do not hold position in the management of the organization

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The Influence of Price and Promotion on Purchase Decisions on Shopee E- Commerce (Case Study on Shopee Customers in Bandung City)

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Abstract - The purpose of this study was to determine the effect of price and promotion on purchasing decisions at E-Commerce Shopee, a survey conducted on Shopee customers in the city of Bandung. This type of research data is in the form of quantitative data, namely data obtained through a questionnaire (Questionnaire) to measure accurate data, the researcher uses a Likert scale with a sample of 50 respondents. The data were processed using multiple linear analysis with the statistical application program SPSS.v.26.0. The results of the research analysis proved overall for each price variable, the promotion variable had a significant influence on the purchasing decision variable. Simultaneously, the price variable and the promotion variable have a significant influence on the purchase decision variable for Shopee customers in the city of Bandung.

Keywords - Price, Promotion, Purchase Decision, E-Commerce

Introduction

Current technological developments have changed the direction of individual people's lifestyles such as reading news, looking for entertainment and buying basic necessities that are easier and affordable. This method is usually done using mobile phones, tablets, laptops, and mobile digital devices, electronic commerce (e-commerce). the use of new technology and business strategies today to do business online. An online business that provides the perfect pathway for selling, marketing, and information online. So today many companies are taking advantage of their promotional activities to be able to compete in the market. According to Munawar (2009) in Aldrin, Muhammad.; Alam, (2020) E-Commerce can be explained as a business method that connects companies with consumers using electronic technology tools such as cellphones and can conduct online transactions in the form of exchanging or selling goods and services and obtaining information electronically. Many people's interest has turned to the internet network as the main channel for purchasing products online, which was originally only used for marketing communications and imaging, now it can also be used as a means of product purchase transactions and promotions.

Shopee is an online shop application that uses the E-Commerce platform. E-Commerce is a platform that provides online shopping and includes applications that are developing in Indonesia, Shopee can be interpreted as an online shopping application that can be run practically using electronic devices, for example, mobile phones, Shopee was first launched in Singapore in 2015 shopee was founded in 2009 by Forrest Li. Not only in Singapore, Shopee also has a fairly wide market share, reaching six (6) countries in Asia, namely Indonesia, Philippines, Taiwan, Malaysia, Vietnam, Thailand. in 2018 within 24 hours shopee managed to get 1.5 million transactions, this is the highest achievement for the e-commerce marketplace that is currently popular in Indonesia, making a strong signal that confirms that Shopee provides the convenience it offers and hopes to increase purchases for the public globally. large. Based on the results of research by MarkPlus, Inc. E-Commerce competition map for Indonesia Quarter III/2020. The results showed that Shopee was the first as an E-Commerce market compared to other E-Commerce in Indonesia.

In addition, Shopee also provides advantages and convenience in shopping, this is often felt by many buyers, including in terms of price and promotion, it is what can influence buyers in making purchasing decisions. Shopee has succeeded in creating an online shopping platform that is social, individual and integrated. monitoring orders through the Shopee application that is integrated with the tracking system without having to go to the website that has been provided makes buyers more confident and comfortable. digital wallet application customers (ShopeePay) to make buyers become dependent on these features.

Making the "all is Shopee" strategy easier to create, Shopee provides the lowest price guarantee, prices that can compete with other E-Commerce markerplaces, as for efforts such as campaigns that are channeled in providing the lowest prices, namely "Cheapest Price Guarantee, 2x Money Back ", Shopee also offers the exact same product at a low price. That's why many buyers are trapped in conflict with the price on Shopee. The existence of a relationship like this can foster trust and purchase decisions to continue to use the Shopee application in the ecosystem created by Shopee to achieve company capabilities and productivity.

In today's technological era, most people buy their daily needs by shopping online and can also easily make purchasing decisions because prices and promotions are very attractive, while another reason is that consumers make practical purchasing decisions because shopee is trusted, easy to use. remember and easy to operate.

Based on the introduction above, the researcher is interested in making a research journal entitled "The Influence of Price and Promotion on Purchase Decisions at Shopee E-Commerce" (Case Study on Shopee Customers in Bandung City).

Methodology

To analyze the research, the researcher uses quantitative methods, to describe an event that occurs in fact, systematically, accurately. Mulyadi (2011) argues that the quantitative method is a research approach used to determine whether the instrument under study is good and meets the requirements that are processed statistically. The associative approach used by the researcher aims to find out a question that is connecting the independent variable (X) that affects the dependent variable (Y).

For the data collected by the researchers, namely the Questionnaire/Questionnaire. The questionnaire explains that the data that has been collected by distributing a list of questions to respondents, the researchers hope that they are willing to give a positive reaction to the list of questions and find out information about the influence of prices and promotions on purchasing decisions on E-commerce shopee, measuring this questionnaire researchers using a Likert scale of 50 respondents.

Population and sample

The population used in this study are shopee application customers in the city of Bandung, the sampling technique uses probability sampling technique, it is explained that each member of the population has the same number of opportunities for those who have been taken as samples. The method used for this research is random sampling because it uses a random technique, which is a technique that is often chosen and is considered fairer or independent of the intervention of research subjectivity.

Results and Discussions

4.1 Multicollinearity Test Results

Table 1. Multicollinearity Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-7.354	3.871		-1.900	.064		
	Price	.356	.134	.296	2.661	.011	.687	1.455
	Promotion	.594	.116	.569	5.106	.000	.687	1.455

a. Dependent Variable: Buying Decision

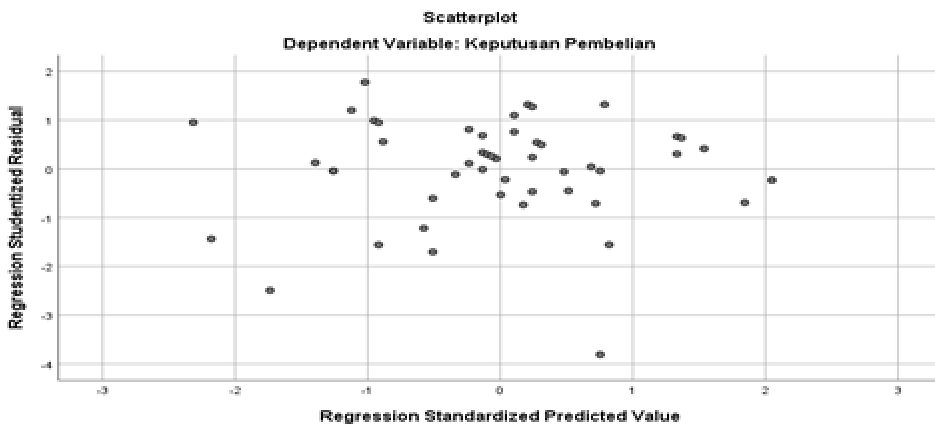
Each value on the variable obtained is a price with a VIF value of 1.455, a promotion with a VIF value of 1.455 and a tolerance value of 0.687. This proves that the VIF value is lower than 10 and the tolerance value is higher than 0.05. which means it can be predicted if the equation in this multicollinearity test is declared passed and does not contain multicollinearity.

Heteroscedasticity Test

This test was conducted to understand whether the data experienced heteroscedasticity deviations, which means the variance of the residuals for all studies in the regression model. if you want to get a good regression model, the data obtained is the same as homoscedasticity.

4.2 Heteroscedasticity Test Results

Table 2. Heteroscedasticity Test



So the homoscedasticity test processed using the SPSS output proves correctly that there is no pattern image that is specifically seen as well as the widespread points below the number 0 on the purchase decision axis, these results do not occur heteroscedasticity in the data studied.

Multiple Linear Regression Analysis

The results of the analysis aim to consider and predict the value of the population average between the independent variable (X) and the dependent variable (Y) through the multiple linear regression test that has been analyzed.

4.3 Multiple Linear Regression Analysis Results

Table 3. Multiple Linear Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-7.354	3.871		-1.900	.064
	Price	.356	.134	.296	2.661	.011
	Promotion	.594	.116	.569	5.106	.000

Dependent Variable : Buying Decision

From the analysis test above, a multiple linear regression equation is made, which can be explained as follows:

Y = a + b1.X1 + b2.X2
Y = -7.354 + 0.356 + 0.594

From these results it can be explained that:

1. Constant (a): the result of Value A is -7.354 which means that the constant or current state of the independent variable (price) cannot be influenced by other variables, namely price and promotion variables. If the variable does not exist, then the purchase decision variable in the e-commerce shopee does not change.
2. Price (X1) on purchasing decisions: the result of the price regression coefficient value with a total value of 0.356 which shows if the price variable has a value that has a positive enough effect on purchasing decisions, it can be interpreted that every 1 unit increase in the X1 variable, namely price, will affect Y, namely the decision purchases on e-commerce shopee is 0.356 with the assumption that there are no other variables studied.
3. Promotion (X2) on purchasing decisions: the results of the Promotion regression coefficient value with an amount of 0.594 shows the promotion variable has a positive effect on purchasing decisions which can be explained that every increase of 1 unit of promotion variable can be concluded that there is an influence on purchasing decisions on e-commerce shopee with a value of 0.594 with the assumption that other variables are not to be studied in this research that has been analyzed.

t Test

The purpose of analyzing this t-test is to compare the average variables (X1, X2) to the variables (Y) that are not related to one another with a significant value level of 0.05 for the results obtained described below :

4.4 T-Test Results (price)

Table 4. T test (price)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-511	4.481		-114	.910
	Price	.738	137	.614	5.393	.000

a. Dependent Variable: Buying Decision

The t test from the table above shows the results of the effect on the price variable on the purchasing decision variable, the result is 0.000, the sig value is 0.005, which means it is smaller than 0.05, the t count is 5.393, which means that the value is higher than the t table in 2012. It can be explained that Ho1 is rejected and Ha1 is accepted, so there is a significant effect of the price variable on the purchasing decision variable.

4.5 T-Test Results (promotion)

Table 5. T test (promotion)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.388	3.350		-414	.681
	Promotion	767	102	.734	7.494	000

a. Dependent Variable: Buying Decision

The t test from the table above shows the results of the effect on the promotion variable on the purchasing decision variable, the result is 0.000, the value is smaller than the sig 0.05 t value of 7.494 which means that the value is higher than the t table in 2012. It can be explained that Ho1 is rejected and the acceptance of Ha1, so there is a significant effect of the promotion variable on the purchasing decision variable.

F . test

The purpose of the ANOVA test is to understand the effect of the significance value between the independent variables (X) together in order to affect the dependent variable (Y).

4.6 Test Results F

Table 6. F test

ANOVA[a]

Model		Sum Squares	Df	Mean Square	F	Sig.
1	Regression	593.796	2	296.898	35.175	.000[b]
	Residual	396.704	47	8.441		
	Total	990.500	49			

a. Dependent Variable: Buying Decision

b. Predictors: (Constant), Promotion, Price

The significance value proves the results that have an effect on the variable with a total significance value of 0.000, the value is also smaller than the 0.05 value and the f count is 35.175, which means that the value is higher than f table 3.20. The results show that Ho3 is rejected and Ha3 is accepted. the influence of price and promotion, on purchasing decisions.

Coefficient of Determination (R2)

To measure the accuracy of the regression line that has been formed from the results of the value of the magnitude of the dependent variable in influencing the dependent variable, the researcher conducted a coefficient of determination test (R2).

4.7 Determinant Coefficient Test Results (R2)

Table 7. Determinant Coefficient Test (R2)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.774[a]	0.599	0.582	2.90526

a. Predictors: (Constant), Promotion, Price

The results of the multiple regression analysis test prove the coefficient of determination (R2) the result of this value is 0.599 if it is percentage to 59.9%. So the results of the coefficient of determination (R2) indicate that the high influence of price and promotion variables on purchasing decisions is 0.599 (59.9%). This means that 40.1% (100% -40.1%) the rest is the influence of other variables which in this study were not examined.

Conclusion and Recommendations

Based on the results of the research tests that have been described above, it can be concluded: There is a significant influence of price on purchasing decisions for shopee application customers, so this proves that the more companies provide affordable prices, the consumers can attract their interest to buy products in the shopee application. There is a significant effect of promotion on purchasing decisions for shopee application customers, so it states that if promotions are carried out continuously with unique and attractive promos, consumers will easily make purchasing decisions and repurchase the product, then there is a significant influence of price and promotion on decisions purchases on the shopee app. so the company can balance a fairly affordable price with the interests of consumers, then by increasing the promotion that is getting bigger so that many consumers are affected to decide to buy products that have been sold at shopee.

For online sellers, it is expected to further improve the business that is being run and pay more attention to prices and promotions that are in accordance with the wishes and needs of consumers, besides that sellers also pay attention to purchasing decisions so that customers can decide which products to buy with certainty. references and other variables in order to obtain relevant results and also add a larger sample.

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Knowledge Management (KM) Practices of the Retail Industry: A Descriptive Mixed-Method Analysis

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Abstract - This study was conducted to ascertain the Knowledge Management (KM) practices of the retail industry in the province of Camarines Norte, Philippines, utilizing the mixed- method of quantitative and qualitative descriptive research design. Findings revealed that the majority of the retail industry highly understand the concept of Knowledge Management. Among the four major components of KM, the retail industry has the highest level of awareness towards the component of people, whereas, on the level of application, it is on the component of the strategy. While on customers' needs and satisfaction, KM strongly contributed to the retail industry and help uplift business operation and performance as well as long-term sustainability. It is concluded that the clinch of the retail industry in technological adaptation will rise up the potential to boost business process, KM practices have a significant impact on the operation of the retail industry. The formulation of a centralized knowledge management system and the collaboration with the Department of Trade and Industry (DTI) is recommended to steadfast the growth of the retail industry that will impact the economic development of the province.

Keywords - knowledge management, retail industry, practices, descriptive, mixed- method, Philippines

Introduction

Sustainable Development Goal #9 seeks to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Industrialization drives economic growth, creates job opportunities, and thereby reduces income poverty. Innovation advances the technological capabilities of industrial sectors and prompts the development of new skills. Inclusive and sustainable industrial development is the primary sources of income generation, allows for rapid and sustained increases in living standards for all people, and provides the technological solutions needed for environmentally sound industrialization (UNOOSA, 2021). Technological innovation and globalization encompass a massive impact on the economy, society, and way of life (Haseeb et al., 2019). Many are adopting new models and finding new ways to guarantee continuity within business approaches, stemming from a spear in technology-inspired industrialization over the past decades (Vargo et al., 2020). The interaction between the customer and the business process is an important factor that the fourth industrialization has brought up.

One of the digital transformations in the retail business is the application of knowledge management. Knowledge management within the retail industry sector has been carried out on the evolution of the fourth industrialization which involves the interconnectedness of machines, human ability, and processes to search out and share data. The evolving field of knowledge management significantly influences the organizational performance and creating an environment where the effectiveness of upcoming transformations must clearly understand (Manesh, 2019). In the study conducted by Dzenopoljac et al., (2018), it examined knowledge management practices and analyzed to have a positive and significant impact on perceived business performance. The knowledge management components which comprise of people, process, tools, and strategy play a significant role of knowledge acquisition, utilization, and sharing processes which increase the ability to innovate and manage the business operation (Rodli, 2017). Times are undoubtedly tough now for retail industries. The rapid growth of future service technologies translates into a multitude of new opportunities for business organization, as well as for customer satisfaction (Kristenson, 2019).

According to Da Silva (2020), one sector that fourth industrialization has great promise is the retail industry. Since the inception of new technology, its tremendous evolution manifested such as increasing consumer demands and rapidly shifting economic conditions. Retailing involves the sales of products or goods from the point of purchase to a customer who has an intention to use the product (Chegg, n.d.). It encompasses a broad or huge industry employing millions of people around the world and a significant contributor of a country's gross domestic product since it generates trillions of dollars annually in sales revenue (Farfan, 2020). However, like any other form of business organizations, most of the players in the retail industry face challenges impeded by the current economic situation and the fast-paced technological revolution. In the research conducted by the University of Buffalo, it shows that 96 percent of the decline in traditional shopping mall revenue is due to the popularity of online retailing (Yan, 2018). In a report posted in CNBC, as of August of 2020 about 60 percent retailing industry experienced and filed for bankruptcy listed a loss of more than $100 million in assets, as compared with 50 percent and 36 percent in the same period of 2019 and 2018 respectively (Thomas, 2020).

In the Philippines according to Philippine Retailers Association (2018), a notable disruption in the retail industry happened in 2018 as the growth of e-commerce platforms with online sales capabilities and start-ups was threatened and disturbed, even the long-established retail businesses. One example of this is the branch opening of an international home furnishing store in the Philippines which intimidated the local furniture and home furnishing business. Another latest trend in retailing industry in the country is the offering of an online mobile store apps. It was initiated by the largest retailing chain in the country as an answer to the limited face-to-face transaction due to the COVID 19. This app helps consumers to easily access a wide array of products and have them delivered straight to the customer's doorstep using an all-in-one mobile application (Business Mirror, 2021). Arreola (2020) sustained evidence on this trend as the findings of his study revealed that 64 percent of Filipino internet users are spending more time on social media, with 23 percent indicating an increased in online shopping activity. E-commerce websites are at the forefront of these online shopping platforms with expected surges in sales revenues in millions of pesos. Technology has already transformed online business transactions into an infinite marketplace. These changes are definitely a wake-up call for many players in the retailing industry. The retail industry should be aware of what major challenges they are facing and heeds into the volatility of the industry.

Seemingly, with regard to industry 4.0, it was observed that retailing business in the province of Camarines Norte, Philippines also has a narrow application and use of digital technologies in their business process. There are several attempts like what one retail grocery store adapted during the time of lockdown in 2020. However, it was not sustained or it is not the primary option for the people in the retail business. Retail industry in the province should glimpse to the concept of innovation since technological digitalization is not only fast changing but also accelerating, and majority of business process is technology-driven.

With the opening of retail store branch in the province by the leading biggest retail chain in the country, and the emergence of different online service business, the competition of going beyond normal retailing might not be ignored, thus local retail businesses will need to think outside the box. The manner the industry responds to the impact of technology driving revolution, and to engage to digitalization is vital in order to have sustainable operation and arrive at the common good. It is imperative for the local retail business to build a sustainable and scalable enterprise which is ready to use, new knowledge management tools that will streamline tasks, boost productivity, and render customer services in real time. In reality, if the local retail industry fails to sustain the concept of knowledge management in the 4.0 era or transform digitally, this business group will not see another generation of customers.

It is in this premise that the researcher opted to conduct this study to describe the Knowledge Management practices of the retail industry in the province of Camarines Norte, Philippines.

Specifically, this study answered the following research objectives:

1. Determine the level of understanding of the retail industry regarding the concept of Knowledge Management;

2. Identify the different components of Knowledge Management practiced by the retail industry;

3. Determine the level of awareness of the retail industry towards the Knowledge Management components of a.) people b.) process c.) tools and d.) strategy;

4. Ascertain the level of application of Knowledge Management in the retail industry along the components of a.) people b.) process c.) tools and d.) strategy;

5. Identify the contributions of Knowledge Management to the retail industry operations in responding to the needs and satisfaction of customers; and

6. Formulate a specific framework from the results of the study that will help the retail industry enhance business operations and sustainability

Methodology

The study utilized a descriptive mixed- method of quantitative and qualitative analysis. It refers to an emergent methodology of research that advances the systematic integration, or "mixing," of quantitative and qualitative data within a single investigation or sustained program of inquiry. The basic premise of this methodology is the integration of more complete and synergistic utilization of data on knowledge management practices of the retailing industry in detail and profundity based on the manifestation of the respondents; propositions and questions about a phenomenon are carefully scrutinized and articulated at the outset rather than do separate quantitative and qualitative data collection and analysis (Wisdom et al.,2013).

The participants or respondents in this study are purposively selected based on the study's purpose, and completely enumerated the ten (10) largest retail stores in the province that are represented either by the owner themselves or a person in authority from its business organization. The retail operation is located in the downtown area and duly registered with the Department of Trade and Industry (DTI) or the Local Licensing Unit of the Municipality of Daet, Camarines Norte. The reason of selecting this Giant 10 to become the respondents of the study is because of their capability of adopting and applying knowledge management, particularly in technological innovation, and advancement in business operation. The names of the retail businesses are not disclosed in any section of this paper. A code or label for every retail business is the alternative solution, to protect the integrity and business legal personality of the retail industry, as well as in compliance with the Republic Act 10173 or the Philippines Data Privacy Act of 2012.

The study instrument was a researcher-made-survey questionnaire that passed through the rigorous review of the research expert. It was validated using a representative sample, which was not included in the respondents' list. Questions were standardized, and all respondents were asked with the same problems in the same order. The data collected from the participants were primary data or first-hand information relevant to the knowledge management practice of the retail industry. Mixed method was applied in data gathering procedure. In collecting the quantitative responses, the researcher personally conducted a survey interview among the retail owners or the authorized representative. After collecting the quantitative responses, a qualitative approach of in-depth and focused group discussion was conducted among the 10 participants from the retail industry in order to substantiated and identify the knowledge management practices of the retail industry.

The procedure in analyzing the study involved two phases. The first is the initial quantitative instrument phase. In questions that need quantitative interpretation, the data gathered were encoded and tabulated accordingly and statistically treated, interpreted, and analyzed. The second phase was followed by a qualitative phase, in which it built directly on the results from the quantitative phase. The quantitative results were explained in more detailed through the qualitative data. This means that findings from quantitative instrument were explored further with qualitative focused group discussion to better understand the knowledge management practices of the retail industry. The use of mixed methods explains qualitatively how the quantitative mechanisms might work (Creswell, 2013).

In line with the research best practices and ethical considerations, the researcher ensured that every participant was provided free prior and informed consent (FPIC) form which the respondents must accomplish before the actual conduct of the survey interview and focus group discussion. Further, the researcher explained to the participants the significance of conducting the study and assured them that any information obtained was only used in relation to the conduct of this research paper. The researcher further ensures that the participation of the respondents is within their free and voluntary act and not forced by any circumstances, thus any refusal may not mean to some extent bring effects to their usual business operations.

Results and Discussions

The study was conducted in December 2020 to April 2021 at the Central Business District of Daet, Camarines Norte, Philippines, the capital town of the province. Most of the businesses were operating in the form of partnership organizations, and have been operating for not less than 5 years.

3.1. Level of understanding of the retail industry regarding the concept of Knowledge Management

Result presents the level of understanding of the retail industry regarding the concept of Knowledge Management. It shows that retail business highly understands the concept of Knowledge Management having a weighted mean of 2.50, which is interpreted as that the retail industry is cognizance to the concept of KM related to their business operation.

Table 1. Level of Understanding of the Retail Industry regarding the
Concept of Knowledge Management

Level of Understanding of Retail Industry to the idea/concept of Knowledge Management Weighted Meant Adjectival Rating
Retail industry concept of KM 2.50 HU
2.34 - 3.00 Highly understand 1.67–2.33 Moderately understand 1.00–1.66 Not at all understand
Legend:

The findings of the study revealed that the retail industry highly understands the concept of Knowledge Management. The retail industry's standpoint on the use of technology possessed utmost knowledge and openness to embrace the use of technology, as well as the significant utilization of innovation and advancement in their business operations. The concept of the knowledge management is an evolving field that considerably influences the current organizational performance in every retail industry. In this context, this sector needs to develop a business ecosystem wherein the effectiveness of industrialization and technological innovation is clearly understood, how it is being created and applied throughout the organizational system.

According to respondent R1, becoming adept at the current technological trend is an underpinning desire of every business organization because it will help them strengthen strategic posture and enhance competitive advantage. This only shows that based on the growing knowledge on industrialization, the sector can have the potential to boost a technology-driven economy and growth in the retail industry. Knowledge management currently exerts a considerable impact on competitiveness within the market. The study is with similarity to Bostoganashvili (2021) as it provides favorable opportunities, as well as challenge market monopolization. Technological platforms have generated new types of businesses and have empowered new value chain sources and a competitive environment. The advent of industrialization triggers new innovations that complement the change in the business processes, finding new ways in getting in touch with customers to be able to communicate with them. The retail industry will continuously evolve to follow development that will build its own dynasty in new retail model introduced by the global retail business (Ellitan, 2020).

3.2. Different components of Knowledge Management practiced by the retail industry

In Table 2, it revealed the different components of KM practiced by the retail industry. Majority of the respondents practiced the concept of people with a perfect mean of 3.0, followed with the concept of strategy with a mean 2.9 and with the concept of process and tools both with the same mean of 2.8.

Table 2. Components of Knowledge Management practiced by Retail Industry

KM Components	Weighted Mean	Adjectival Rating
People	3.0	HP
Process	2.8	HP
Tools	2.8	HP
Strategy	2.9	HP
Average Weighted Mean	2.8	HP

2.34 - 3.00 Highly practiced 1.67–2.33 Moderately practiced 1.00–1.66 Not at all practiced

Legend:

The result implied that most of the KM concepts are a symbiotic part of any retail industry. As the significant component of the organization, people can be considered as the channel of traversing creative ideas, applying for internal and external processes, and sharing them as they are the keeper of the knowledge. Sharing knowledge requires tools that will convert ideas into information that must be accessible for all in order to generate strategies in achieving organizational goals and enhancing competitive advantage. The study has a similarity to Choi et al., (2020) findings which stress that KM activities optimistically impact an organization's performance, highlighting the need for continuous refinement and development of system thinking in order to direct company or business organization high level of innovation performance.

3.3. The level of awareness of the retail industry towards the Knowledge Management components such as a.) people b.) process c.) tools and d.) strategy.

In Table 3, results inferred that generally retail industries are highly aware of the different components of Knowledge Management gaining a total weighted mean of 2.60 means that the retail industries are absolutely or fully-aware of the concept of Knowledge Management in their business operation more particularly on the component of people.

Table 3. Level of awareness of the retail industry towards the different components of Knowledge Management

Knowledge Management idea related to the 4.0 Era	Weighted Mean	Adjectival Rating
People (keep, apply, and share knowledge)	2.80	HA
Process (create, capture, store, organize, and distribute knowledge)	2.50	HA
Tools (system and technology use for sharing KM information internally and externally)	2.50	HA
Strategy (facts and data that people are converted and apply as knowledge)	2.50	HA
Total Weighted Mean	2.60	HA

Highly aware (HA) 2.34 - 3.00 Moderately Aware (MA) 1.67– 2.33 Not at all Aware (NA)1.00 – 1.66

Legend:

Results denote that the retail industry is highly aware of the significance of the different components of knowledge management in their organization. The industry needs the right people at different levels and different areas of the organization who will keep, share, and apply the concept of knowledge management and really build knowledge sharing into the organizational culture to ensure the sustainable implementation of the program in their organizational approaches. Smart processes and tools are needed to manage and measures KM drives that will connect people to the right strategy and content at the right time (Harper, 2019).

The process is based on the retail industry knowledge management framework. It will allow them to create, capture, store, organize, and distribute knowledge that generates value for their organization. A clear and documented work flows, content, and a compelling strategy is an imperative component of the KM for it will help leverage the retail industry and assess results to improve their strategic decision-making.

Respondent R3 imparted that knowledgeable people on the process of KM is their best asset, if it is necessary to send people for training, the management is allowing their people to attend in order for the employees to become more adept with the latest trend in technology and innovation. With all the technological changes and influence on business strategies, more and more businesses tend to change or create new business segments and develop sustainable directions (Tohãnean, 2020a). Respondent R4 added that it is inevitable for the retail industry to leverage the knowledge in technological advancement, although it takes an amount of investment since it is the current trend in the market. Their only option is to embrace it, knowing that pursuing a KM platform will contribute to the efficiency and effectiveness of people in delivering their task and harnessing organization collective knowledge for their advantage.

The result of this study is with resemblance with Tohãnean (2020b) analysis which shows that business organizations that invest in digital tools in order to develop more agile practices are likely to report that expectations of digital transformation efforts are at the forefront of their business and investment plan. This is in order to achieve more and bring innovative business solutions by developing internal creativity, bringing new skills to the business market especially in the field of digital knowledge. The result is clear, innovation, sustainability, and technology are present at all levels of business organizations, and these are the key pillars for business success especially in the expanse of the retail market.

3.4. Level of application of the retail industry to the different components of Knowledge Management along with 1). people 2). process 3.) tools and 3.) strategy

3.4.1. People

Data in Table 4 reflects the level of application of the retail industry of Knowledge Management along with the component of People. Promoting collaboration with other functional units within the business organization is the KM component that is highly applied by the retail industry in business processes with a weighted mean of 2.70. It was followed with the application of assisting people and ensuring that the skills gap is a bridge through continuous transfer and sharing of knowledge from one functional area to another department making proper utilization of implicit knowledge related to the knowledge management having a weighted mean of 2.50.

However, it is noteworthy that in general view the application of the concept of people is only at the level of moderately applied with a total weighted mean of 2.14, interpreted as the retail industry is reasonably or fairly applied the KM concept in their entire operation.

Table 4. Retail industry level of application of Knowledge Management
along the component of People

Knowledge Management Concept PEOPLE	Weighted Mean	Adjectival Rating
1. developing people potentials related to the application of Knowledge Management in the 4.0 era	1.90	MA
2. assigning people with high level knowledge on the application of the concept of 4.0	1.90	MA
3. acknowledging people with initiative and lead organizational and technological change	1.90	MA
4. assisting people and ensuring that the skills gap is bridge through continuous transfer of knowledge	2.50	HA
5. promoting collaboration with other function and ensure organizational effectiveness related to 4.0		

2.70 HA
Total Weighted Mean 2.14 MA

Highly applied (HA) 2.34 - 3.00 Moderately applied (MA) 1.67– 2.33 Not at all applied (NA)1.00 – 1.66
Legend:

The finding shows the retail industry idea on applying the component of KM as to the concept of People which figuratively promote collaboration with other function ensuring organizational effectiveness through the continuous transfer of critical knowledge within the entire organization. As it was previously learned that people are the most important asset of any organization, the top-level management of the retail industry must extend support to the development of their people especially in the context of knowledge management systems. Encouraging and nurturing employees' talent at all levels and initiating long–term commitment from the top management will enable the KM system to work in the industry. The important function is the documentation of individual knowledge especially the tacit one and the dissemination of it within the organization once it was converted to explicit knowledge. Investment in knowledge management throughout the entire business operation helps the organization develop new strategies and refine existing offerings (Gonzales, 2014).

Based on the perception of respondent R5 full cooperation among employees will underpin the KM system. Employees' motivation is a key determinant of success, it will stimulate creativity, to come up with the out of the box approach that will foster innovation. However, it cannot be denied that there are also employees which are resistant to changes especially those who are not so much affable of using new technologies. The reason why some of the retail businesses are reluctant to fully implement the technological changes in their business operations.

Similarly, Zahari (2020) explains that every organization must have a mechanism to manage existing knowledge which is cited as knowledge management (KM), a collection of principles, processes, organizational structures, and technological applications that helps business to share and leverage organizational knowledge which is aligned with business goals. The focus is the responsibility of individuals or knowledge of employees, on the holistic concept of knowledge management. It is considered the elemental of sharing and application of data, and often rationale why the creation and application of latest knowledge are incredibly important for the survival of business organization today. Supported the concept of the KM, organizations can capture any types of knowledge that are structured and reuse them as a strategy to support business learning cultures in enhancing the organization's competitive advantage.

3.4.2. Process

In Table 5 it shows the retail industry level of application of Knowledge Management as to the concept of Process. Majority of the processes are highly applied by the retail industry which include knowledge storage as designing, preserving and creating knowledge in all areas of operation and knowledge use such as reviewing the knowledge as to its relevancy, accuracy, and applicability. Both have a weighted mean of 2.80, knowledge distribution or accessing and sharing KM through documentation, informal posts, collaboration activities and through push and pull mechanism with a weighted mean of 2.60, and the knowledge acquisition by identifying and collecting knowledge that is critical to strategy and operation gaining a weighted mean of 2.40

In general, results depict the retail industry highly application of knowledge management process in their business approaches with a total weighted mean of 2.64 analyze as the industry is fully applying the knowledge management process in their business operation.

Table 5. Retail industry level of application of Knowledge Management
along the component of Process
Knowledge Management Concept
PROCESS Weighted Mean Adjectival Rating

1. Knowledge acquisition by identifying and collecting knowledge that is critical to strategy and operation
2.40 HA
2. Knowledge storage designing, preserving and creating knowledge in all areas of operation
2.80 HA
3. Knowledge use - reviewing knowledge as to its relevancy, accuracy, applicability, and using it to solve problems and make informed decision
2.80 HA
4. Knowledge distribution accessing and sharing KM through documentation, informal posts, collaboration activities, and through push and pull mechanism 2.60 HA

Total Weighted Mean
2.64
HA
Highly applied (HA) 2.34 - 3.00 Moderately applied (MA) 1.67-2.33 Not at all applied (NA) 1.00 – 1.66
Legend:

The result implies that the retail industry is highly applying the different knowledge management processes. Knowledge acquisition can be done by obtaining knowledge from the business environment, primal facts that are being transformed into explicit information which can be of help to solve business-related problems. Knowledge acquisition is critical because once collected data is incorrect, knowledge gain would also be inaccurate. This may bring disaster to any business organization.

On the manner of storing knowledge particularly on customer records, the retail industry repository of knowledge is through their computer database. Retail industry ensure that all collected knowledge from their customers are properly organized in an orderly manner for better use and references. Accordingly, majority of the retail businesses have existing local area networks that support their information technology. Respondent R7 stressed that full computerization in their operation is included in their business strategic plan. The importance to leap up their computerization is one way to have better service to the customers. Customer-related information that transferred into knowledge management is a significant factor in retaining business competitive advantage (Sedighi, 2012), the reason that a certain percentage in the retail industry total operating expenses are allotted for the upgrading of their computerization program and systems. This approach could also help the retail business improve organizational processes and create a well categorized and excellently mapped knowledge management system.

With regards to knowledge utilization, the retail industry applied it within the context of the organization. Knowledge use is an important component of the management process since it facilitates value creation for customers and encourages faster transactions of the business. Knowledge can be applied to either be explicit or implicit. During the interview, respondent R9 implies that knowledge obtain is reviewed as to its relevancy, accuracy, and applicability. To what stage of the business process it must be applied in order to complete a certain task necessary for rendering an important decision. The acquired knowledge is not useful if it is not distributed to the right people at the right time in the organization. The retail business allows its employees to have access to the collective information of the business through their computerization process. The knowledge-based program utilizes employees' interactive capabilities and attempts to standardize knowledge in a properly stored format to make them available to all employees who would benefit the most (Smith, 2008). However, some of the respondents also point out that the level of implementation of knowledge management is not fully realized due to some constraints like the available resources and the right manpower who will man the program.

3.4.3 Tools

The data revealed in Table 6 show the retail industry knowledge management concept on Tools used in organizational process which include E-commerce and Smart retailing, with the weighted mean of 2.80, interpreted as fully applied or tools that are utilized at all times by the retail businesses. Whereas, the use of big data is the least KM tool that is applied in the retail business operation, obtaining a weighted mean of 2.00. In general, the sector of retail industry in the province highly applies the different KM tools in their strategic business process, with a total weighted mean of 2.46.

Table 6. Retail industry level of application on Knowledge Management along the component of Tools
Knowledge Management Concept

TOOLS	Weighted Mean	Adjectival Rating
1. E-commerce (business approach that let firms and individuals buy and sell things over the internet)	2.80	HA
2. Big data (large base of information that can be turned into knowledge)	2.00	MA
3. Smart retailing (a set of smart technologies designed to give the consumer greater, faster, safer and smarter experience when shopping)	2.80	HA
4. Internet of Things (connectivity of cyber object through the internet to send, share, exchange, and comprehend data and information)	2.60	HA
5. Cyber-physical system (a class collection of system enable integration which facilitates computation, communication, controlling operation, and interaction with the task environment)	2.10	MA
Total Weighted Mean	2.46	HA

Highly applied (HA) 2.34 - 3.00 Moderately applied (MA) 1.67– 2.33 Not at all applied (NA) 1.00 – 1.66
Legend:

The findings of the study present the Knowledge Management concept on tools utilized by the retail industry in business operations. The majority of the respondents applied the technological tools which is the evolvement of digitalization and technological advancement. It encourages new platforms of communication to create a more connected model across the organization. The retail industry is doing its best to manage the changes, embracing a shift in work processes, as well as to the entire organizational culture (Joshi, 2019). Automation becomes the heart of the workflows, particularly in the aspect of customer service, inventory management, purchasing, supply chain management, and the like.

The introduction of e-commerce and smart retailing approaches gives rise to customer-centric business strategies, and promotes innovative changes in their business models. Integrating knowledge management tools in the business process interject the ability of organizations to become a customer-oriented organization, improving firms and the customers' relationships (Abu-Shanab, 2014), thus improving performance and loyalty for future transactions, and market share.

A parallel study conducted by Zhan et al., (2020) in the field of retail pharmacy explained that the digital economy is forcing the retail industry to develop a framework that will help retail businesses in realizing operational excellence. Big data captured on social media especially customer behavior and interaction help retail organizations obtain insights into current market needs and enhance business intelligence. It further revealed that matters about the application of social media in the areas of marketing, customer service, and product are the issues that the retail industry needs to consider; hence, improving technological platforms will significantly improve operations and quality of customer service.

In the conference spearheaded by the Philippine Institute for Development Studies (PIDS) in December 2019, the importance of business digitalization was emphasized, that, to be able to tap business opportunities in the evolving digital economy, digital transformation is a key, and this must be done briskly, otherwise, the retail industry will be left behind (Pascual, 2019).

3.4.4 Strategy

In Table 7, result of the study discloses the level of application of different strategy of the retail industry which included the integration of data and knowledge management into different business process together with the implementation of core competencies related to the knowledge management both gaining a weighted mean of 2.80. It was followed by embracing technological advancement through investing resources to digitalization, with the mean of 2.70, and improving and using of digital information and transforming it to explicit knowledge. On the other hand, the least strategy applied is sustaining holistic approach of data driven decision making along knowledge management in the era of 4.0, having weighted mean of 2.50.

Generally, the level of application in terms of knowledge management concept on strategy of the retail industry manifested high application exhibiting a total weighted mean of 2.68.

Table 7. Retail industry level of application on Knowledge Management along the component of Strategy

Knowledge Management Concept STRATEGY	Weighted Mean	Adjectival Rating
1. Contribute to overall organizational goals by embracing technological advancement through investing resources to digitalization	2.70	HA
2. Balance people, and processes in implementing core competencies in the business practice	2.80	HA
3.Develop appropriate integration of data and knowledge management into organizational capabilities	2.80	HA
4.Using common processes and technological tools to encourage collaboration among or within the organization to improve digital information	2.60	HA
5. Innovate the KM concept to sustain holistic approach by creating tangible results or transforming it to explicit and useful knowledge that driven strategic decision making	2.50	HA
Total Weighted Mean	2.68	HA

Highly applied (HA) 2.34 - 3.00 Moderately applied (MA) 1.67– 2.33 Not at all applied (NA)1.00 – 1.66
Legend:

The study emphasized the retail industry application in terms of knowledge management concept of Strategy which involved strategies or plan to help them manage relevant information, integrating the gathered data, converting to explicit knowledge and utilizing it through appropriate technological tools and competent people to ensure the success of organization. Knowledge management concept must be converted into useful and tangible strategy aligned to the business long term goals and will contribute to overall accomplishment of organizational objectives. As respondent R2 imparted that closer attention to the strategy is empirical to ensure the KM system as well as the technology it involves since it will be the determining factors of retail business' future growth and development. The increase or decrease in KM strategy performance should be given preferential attention because it may entail cost or revenue to the business. Retail owners should look into consideration the scalability of the program be it software or hardware concern and should be reviewed and evaluated on a regular basis.

Omotayo (2015) articulates the role of knowledge management in value creation and comprises a multiplicity of integrated projects or activities phased over time including quick wins in addition to long-term benefits. An organization's KM strategy should not be one-sided but depends on the way the retail business serves its clients, the economics of its business, and therefore, the engagement of the people. It has been advised that KM must not be implemented only because it is just an idea of nice-to-have (Greiner, et al., 2007) but rather it is a critical organizational resource and the alignment of KM to business strategy is, therefore, a measurement of KM impact in driving business results.

Moreover, in the study of Kunc and O'Brien (2018), it is clearly stated that several organizations consider business analytics to be a key organizational capability. Today, there is little evidence on how organizations have included analytics at the guts of their processes by providing important data-driven insights into strategy. It is therefore, important to the retail industry to define KM priorities and how it will be linked to overall business priorities, communicate critical knowledge management strategies in all levels of organization, and evaluate progress. A roadmap or implementation plan maybe created to monitor flow, creation, and sharing of business strategy critical to knowledge management approaches.

3.5 Contribution of Knowledge Management to the business process of the Retail Industry in responding to the needs and satisfaction of customers

This portion of the study explain the contribution of KM in the fulfillment of customer needs and satisfaction. The data gathered were analyzed through the computation of measures of central tendency.

In Table 8, it reflected how the retail industry use knowledge management in satisfying the needs and wants of the customers, obtaining a total weighted mean of 2.86, interpreted as in all instances of business operation, KM was integrated to the strategy of customer satisfaction. Knowledge management empowering customers to get what they want, whenever they want, and how they want it, use also as feedback mechanism, help to anticipate the needs of present and future customers, and encouraging the retail industry to build personalized customer experience.

Table 8. Contribution of Knowledge Management in responding to the needs
and satisfaction of the customers

Knowledge Management (KM) Contribution to the needs and satisfaction of customer	Weighted Mean	Adjectival Rating
1. KM helps the retail industry to empower customers to get what they want, whenever they want, and how they want it.	2.90	SC
2. Having the right KM approach helps retail industry to power up digital strategies which is fundamental in delivering up to date services to the customer.	2.90	SC

3. KM encourages retail industry to build personalized customer experiences. 2.70
SC
4. KM serves as feedback mechanism tools to further optimize customer satisfaction. 2.90

SC
5. KM anticipates the needs of present and future customers of the retail industry. 2.90

SC
Total Weighted Mean 2.86
SC
Legend: 3.00-2.34 Strongly Contribute 2.33-1.67 Contribute 1.66-1.00 Not Contribute

The result explains that for the retail industry, Knowledge Management plays a significant role in responding to the needs and satisfaction of their customers. It also promotes building strong market opportunities and be able to beat the competition with better service. It implies that when the retail industry collects and understand information about their customers, it started building a competitive advantage by responding to the needs and providing satisfaction of customers. The value of customer knowledge must not be neglected. Knowledge management platform will help the retail business to stay focused on customer information. It will eliminate delay as all information is combined in one platform making it easier for retrieval and use. Having an updated and accurate consumers' information helps retail industry to become abreast to the changing needs and desires of their client as this may serve as feedback mechanism. This will enable the retail industry to fast track to the most frequently raised issues or concerns of their customer. Respondent R6 shared their experiences during the lockdown stage. Because of the deposited customers' information in their database, the business will able to connect with the client and extended services through digitalized store operation. In responding to the government's call to stay at home, their IT department developed an online platform wherein customers automatically receive messages or information asking if they want (customers) to order/buy food packs or grocery items and be delivered at customer's own doorstep. Many customers responded to this approach and even now, the retail business is still using the platform. With this kind of strategy, customers felt their importance. Through the support of knowledge management processes (Castagna, 2020), the retail business was able to build strong relationships with customers, thus promoting loyalty in the end. This proves that the knowledge management approach helps the retail industry to power up digital strategies which are fundamental in delivering up-to-date services to the customer, simplifying customer information and amalgamating all communication to better achieve organizational objectives.

Chierici et al. (2019a) in their study revealed that customers' data gathered from social media produce different effects on knowledge management practices and firms' innovation capacity. Increased innovation capacity turned out to affect customer relationship performance directly while it contributes to gain better financial performance only when it is used to gain relational outcomes (Chierici et al. (2019b). Thus, business organizations should meet the demands and expectations of customers to provide satisfying services and enhance service quality (Al-Suraihi, 2020), and that the integration of knowledge management leads to a sustainable competitive advantage (Bashir, 2018) which would automatically boost firm competence.

3.6. Formulation of the proposed framework to enhance the performance and sustainability of the retail industry

The proposed framework of the study will be called a Giant 10 Knowledge Management Framework. As the centralized platform of repository of knowledge, this framework will connect people across the industry, the local retail businesses, the customer, the government, the academe, and the non-government organizations or NGOs, and the civil society. The system will be administered by the Camarines Norte State College (CNSC)- College of Business and Public Administration in its initial stage of implementation, as the latter is the proponent of the program, and to foster fairness among the users.

The KM program will design, collect, and disseminate customers' surveys, organizations' best practices, product information, services offered, consumers/customers' inputs/concerns, and other qualified and valid insights. This database will provide a continuous up-to-date knowledge and the information collected will be the basis of creation of set of action that will help build competitive advantages among the retail industry and promote better relationships with customers and the general public.

Presented in the following page is the Knowledge Management Framework of the Giant 10 Retail Industry.

Figure 1. The Knowledge Management framework of the Giant 10 retail industry which revolves on the People, Process, Tools and Strategy

Conclusion and Recommendations

The study concluded with compliance to the Sustainable Development Goal (SDG) #9 that, technological progress is a key to finding lasting solutions to both economic and environmental challenges, promote sustainable industries, and ways to facilitate sustainable development. The occurrence of the digital revolution era towards the network of the retail industry has transformed the way the retail business is being performed. The majority of the respondents are cognizant to the concept of the Knowledge Management, possessed utmost knowledge and openness to embracing the use of technology and the significant utilization of innovation in the business operation. The retail industry adopted the idea of knowledge management denoting the significant role of its different components like the need of having the right people in different areas of the organization to keep, share, and apply the concept of knowledge management. The process is the framework that creates, stores, organizes, and distributes knowledge that generates value for the organization. It encourages a new platform of communication tools to create a more connected model across the organization with the support of a compelling knowledge management strategy. Automation becomes the heart of the workflows especially in the process of responding to the needs and satisfaction of the customer. The value of customer knowledge must not be neglected, for it helps the retail industry to become abreast of the changing needs and desires of their client as this may serve as a feedback mechanism. Hence, technological adaptation will rise up the potential to boost business process, KM practices have a significant impact in the operation of the retail industry. The formulation of a centralized knowledge management framework and the collaboration with the Department of Trade and Industry (DTI) is recommended to steadfast the growth of the retail industry that will give impact to the economic development of the province.

The result of the study highlighted the application of Knowledge Management practices related to the fourth industrialization of the retail industry in the province of Camarines Norte, Philippines. In order to leverage the knowledge management practices of the retail industry, it is recommended to:

- encourage group effort among the retail business to have a digital-sharing system of important ideas related to KM (with an exception of the business trade secrets), best practices, and lessons learned so that the entire industry will refurbish with a centralized KM repository of knowledge and promote a new culture of knowledge sharing and customize information in an innovative way;

- develop among the retail industry a customer-oriented organization supported by appropriate KM approach in order to improve long term relationship between the retail industry and its business environment;

- promote framework of collaboration among the different government agencies particularly the Department of Trade and Industry (DTI), as well as non-government organizations, and the civil society to better serve the consuming public; and

- a future research study may be conducted to assess the relationship of knowledge management and customer experience among the retail industry.

Acknowledgement

No financial grant was received in the preparation of this manuscript. The researcher/author wish to thank all the people who extended their expertise in the conduct of this study.

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ENGINEERING AND TECHNOLOGY

Feasibility Study on Manufacturing of Dried Plantable Moss Pot

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Abstract - The pottery business is one of the booming businesses right now, due to the lock down, many turn to planting and the demand for earthen pots increases. Thus, a study on feasibility of manufacturing of Dried Moss Plantable Pot was created which aim to make innovation in plant pot product design and function in order to tackle market competition effectively.

Plant pots made out of dried moss are sustainable and earth friendly. Dried moss can store water, even when dead, which is why it is often used as planting medium. Moss naturally fades from green to brown with age and is suitable for use anywhere in the garden.

These pots are biodegradable containers; the potters can easily plant their pots on soil and will undergo its decomposition. With more and more of us becoming conscious of our impact on the environment, many of us are constantly looking for new ways to reduce, reuse, and recycle responsibly.

With the Sustainable Development Goals as one of the main priorities, creation of sustainable businesses as well as continuous innovation in terms of design, durability, and material can increase the support and interest of customers.

Keywords - *Sustainable Development Goals, Circular Economy, Plantito/a, innovative pots*

Introduction

In the last six decades, the massive production of plastics has led to an enormous amount of waste worldwide. Over 320 million tons of polymers were produced across the globe in 2015; but unfortunately, less than 10% of the manufactured plastics are actually recycled, and a huge amount is gathering in landfills or thrown away into the environment as litter. Non-renewable petroleum-based plastics are being used in a wide variety of fields. Particularly, modern agriculture uses a huge quantity of plastics stuffs, i.e. direct coverings, greenhouse covering films, soil mulching and solarization films, silage films, shading and protective nets, nets for harvesting and post-harvesting operations, irrigation and drainage pipes, strings and ropes, pots, packaging containers and sacks. The practice of using plastic materials in agriculture is often referred to as plasticulture. Plastic waste may reduce soil porosity and, therefore, decrease circulation of air. It can also affect microbial populations, and potentially decrease the fertility of the farmland. Fragments of plastic materials have also been shown to release phthalate acid esters into the ground.

Biodegradable containers or biopots are a sustainable alternative to petroleum-based pots that could easily adjust to horticulture and floriculture production, reducing the enormous amount of plastic waste, and providing outstanding marketing opportunities. Another advantage is the plant, along with the fibre pot, can go straight into the ground. This means no root disturbance, no transplant shock and no down time while roots settle in. This is ideal for fussy plants such as coriander, which tend to bolt to seed if their roots are disturbed.

And as the increase of the demand of potteries due to the continuous interest of many in ornamental plants as well as herbs and urban farming, the concern of sustainability and circular economy was also increasing. And that is why feasibility on manufacturing of dried moss plantable pot was conceived. With more and more of us becoming conscious of our impact on the environment, many of us are constantly looking for new ways to reduce, reuse, and recycle responsibly. When it comes to our plants, then, using biodegradable plant pots is an easy way to look after the world while also looking after our leafy friends, and it can come with some surprising benefits. Continuous innovation and launch of new flower pots & planters in terms of design, durability, and material are believed to propel the future growth of global flower pots and planters market.

Materials and Methodology

This study use dried moss, as the main material for the plantable biodegradable pots. This material is easily accessible in the Philippines and found in shady damp corners and other places that water may flow, which will be harvested and dried up before grinding. A mixture of starch and water will be heated and will served as binder will be mixed with the dried moss before poring and setting it in the pot mould.

Design of Experiment and Kano Analysis was used to determine the required size, thickness, required strength and drying time (before removing in the mould and additional drying time before packaging) and was conducted from June to September of 2021 in Quezon City and municipality of Rodriguez, Rizal. Survey was conducted to determine the market acceptability and Quality Functional Deployment.

Results and Discussions

The result of the experimentation yields the optimized specification that satisfies the target respondents and this can be seen in table 1. Depending on the usage, the Dried Moss Pot can last from 6 months to 5 years upon putting soil and plant on the pot and watering it. If it is buried in the soil, and in moist area, it increases the decomposition process.

Table 1. Product Specification

Product	Dried Moss Pot
Characteristic	Plantable Biodegrable pot
Designs	2 types, Circular and Square type
Sizes	For Circular upper side outside Diameter is 160mm and inside diameter is 140mm, Bottom diameter is 110mm. Thickness is 10mm and height is 140mm For square type Thickness is 10mm, Upper sides inner part is 150mm, outer part is 170mm. bottom outer side is 110mm.
Weight (Dried and ready for selling)	lightweight
Advantage	Totally organic, no harmful chemicals

Figure 1. Product Dimensions

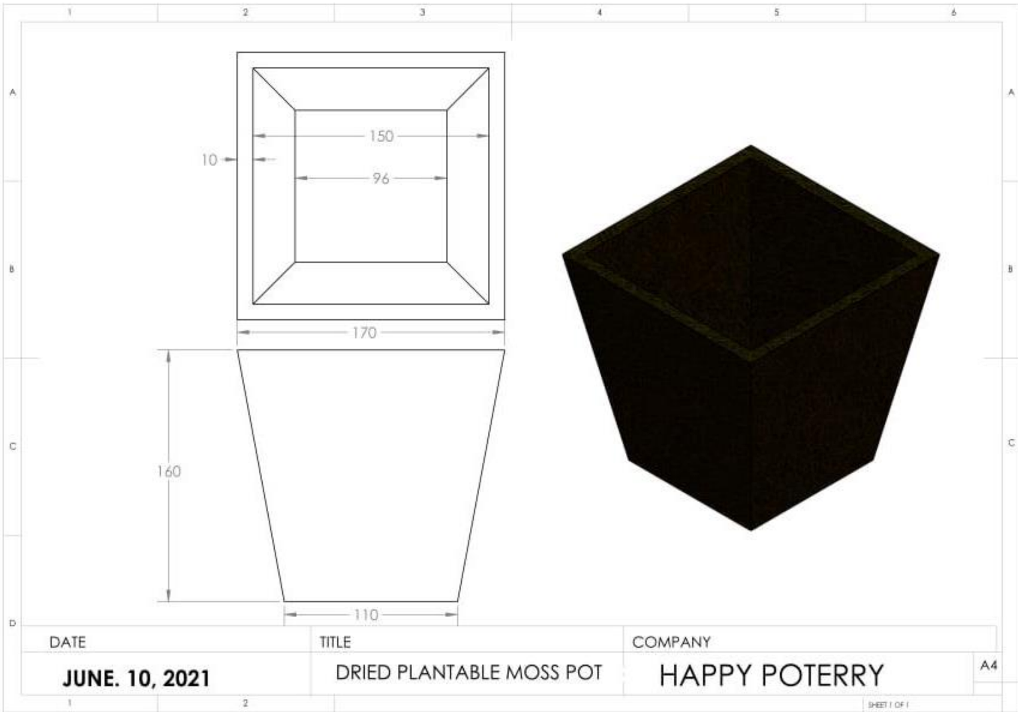

Figure 2 . **Product Design**

The mixture ratio of the binder to the dried moss that yields the best durability is the 56.25 grams of starch per 1.25 cups of hot water, mixed until the starch is dissolved, sticky and consistent (approximately 10 minutes). The mixture will be poured in the basin and the50 grams dried moss will be added gradually while mixing. This will be poured in the mould and if without hot press, and only air dried, it will be stayed in the mould by 25minutes before detached and let it sun dried again until fully hardened. For hotpressed mould, you can automatically release it in the mould and sundried.

Conclusion and Recommendations

The process and materials required to produce the goods are readily available in the market in terms of technological and manufacturing viability. The use of biodegradable and plantable pots can greatly help the problems in creation of waste such as plastics, and encourage circular economy.

There are also different materials that we can try to create biodegradables and plantable pots that its either plant wastes, animal wastes or organic wastes. With the continuous demand for plants and plant pots, what we can do is provide suitable alternatives that are sustainable, waste free, and create jobs as well for our community.

Acknowledgement

A heartfelt gratitude is being dedicated to the faculty and management of the College of Engineering for giving a wonderful opportunity to have this feasibility study as well as giving encouragement and support.

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A Study of Utilizing Biogas Fuel in a 2 Stroke Internal Combustion Engine

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Abstract - The Biofuels Law (RA 9367) aims to minimize the dependence on fossil fuels and encouraged the use of bio-based fuel sources as an alternative fuel in rural areas where farming is their only source of income and energy is scarce. Biogas is a renewable energy carrier consists of a methane and carbon dioxide mixture. Because of its improved mixing ability with air, clean-burning nature, and high-octane number that resists knocking, it is an excellent alternative source of energy to employ in internal combustion engines. The single-cylinder two stroke spark ignition (43cm3) was designed to be fed with a variety of fuel in order to assess engine performance parameters such as speed, brake power, BSFC, and thermal efficiency at different throttling positions (Low load throttle and High load throttle). This study evaluates the engine performance of biogas, Liquefied Petroleum Gas (LPG) and Gasoline with two-stroke engine oil (2T) in a dynamometer without modifying the compression ratio. To optimize its use as a fuel for power generation, biogas is purified using hydrogen sulfide adsorption and carbon dioxide absorption. The results showed that among the three (3) fuels studied, Biogas Fuel from swine manure generates the highest electrical power load of 761 Watts with a methane concentration of 51% and a bsfc of 1.4 kg/kW-h. Thus, LPG achieves the highest engine speed at 14,700 rpm with 549 Watts. As a result, the purified biogas fuel can be used in a small-scale internal combustion engine.

Keywords - Biogas Fuels, Liquified Petroleum Gas, Spark Ignition Engine, Gasoline with 2T engine oil, 2 – stroke engine

Introduction

The availability of biogas as a renewable energy source is increasing due to establishment of many organic waste processing facilities around the world. The need of electricity to support daily life activity is a must, but the availability of electric sources in the remote areas is limited, especially for farms that are far away from commercial electric distribution lines (Lie, D., et. al., 2021). Many studies are being conducted to reduce the harmful effects of exhaust emissions gases caused by the use of gasoline, diesel, and LPG fuels in internal combustion engines (ICEs). The fact that the use of fossil fuel-based fuels is harmful to the environment and hazardous to human health has led the researchers to search for alternative fuel sources. (Uslu and Celik, 2018). These alternative fuels for spark ignition engine can be classified as synthetic gasoline, liquefied petroleum gas (LPG), compressed natural gas (CNG) and biofuel. Biofuel has long been used in internal combustion engines due to its ability to reduce emissions and increase thermal brake efficiency. The use of alternative fuels such as biogas is one way to reduce fossil fuels consumption (Simsek and Uslu, 2020).

Biogas is a flammable mixture of different gases that are produced by the decomposition of biodegradable organic matters in the absence of air (no oxygen) and the presence of anaerobic micro-organisms. It consists of a mixture of 55–65% methane (CH_4) and 35–45% carbon dioxide (CO_2) with small traces of nitrogen, oxygen, water vapor and hydrogen sulfide, which are produced naturally (Kaparaju and Rintala, 2013). Among these components, only methane is essential in the combustion process, and the other components are not flammable at normal conditions but significantly reduces the calorific value of the fuel. It has a great potential to be applied in internal combustion engines because of its better mixing ability with air and clean-burning nature. When biogas is purified, it has a lower cost and lower emissions than any other secondary fuels. It also has a lot of potential because of its higher knocking resistance that allows spark-ignition engines to run at higher compression ratios, which increases the brake thermal efficiency value of the engine. It can be supplemented with liquefied petroleum gas (LPG) and compressed natural gas (CNG) if it is used in compressed form in cylinders (Barik and Sivalingam, 2013).

In addition, some studies on the use of biogas in SI engines have been conducted in recent years. Hotta et al. investigate raw biogas in a 10-compression ratio gasoline engine, and the results show that the BSFC increases by 66% while BTE decreases by 12%. On the other hand, Reddy et al. investigate the use of biogas in SI engines under different loading conditions at different fuel flow rates, and results show that the thermal efficiency is reduced by 4%, and the test generator using biogas and LPG shows biogas as emission less fuel, resulting to less CO. Nayak et al. investigated the effects of different gasoline and LPG mixtures (25%, 50%, 75% and 100% LPG) on the SI engine at different engine speeds. According to the experiment results, the pressure increases as the LPG ratio in the test fuel increases. Chandra et al. conducted an experimental investigation in an Internal Combustion engine. The thermal efficiency, specific gas consumption and brake power of methane enriched biogas were comparable to compressed natural gas. As a result, methane-enriched biogas has shown an increase in 1.6 times of power output over raw biogas when used in SI engine. It was concluded that the methane enriched biogas has excellent fuel properties similar to natural gas. Çinar et al. also investigated the effects of gasoline and LPG on engine brake torque, power, BSFC, gas emission and exhaust gas temperature on a single-cylinder and four-stroke at various engine speeds. They stated that the use of LPG increased BSFC and gas emission while decreasing brake engine torque. Although there are many studies in recent years on the use of biogas and LPG in 4-stroke SI engines, there are no studies on the use of LPG, gasoline and biogas in 2-stroke spark-ignition engine. Therefore, information about comparing the use of various biogas, LPG and gasoline with 2T engine oil on engine performance parameters with different throttling opening positions is missing in the literature. This study was conducted to address this deficiency.

Thus, the aim of the study was to increase the biogas yield through the purification and upgrading of biogas from various biomass substrates such as cow, swine and 1:1 ratio of cow and swine manure mixtures as an alternative fuel source. It also aimed to test the purified biogas fuels in a 2-Stroke Spark Ignition engine generator and compared with benchmark fuels (Gasoline with 2T engine oil and LPG). Moreover, it also intended to determine the engine performance parameters such as Speed, Torque, Brake Power, Brake Specific Fuel Consumption, and Brake Thermal Efficiency under different throttling opening conditions (Low Load Throttle and High Load Throttle) considered for power generation applications. The following are the specific goals of the research: (a) to investigate the benchmark fuels in a 2-stroke spark ignition engine at various throttling opening positions. (b) to test the purified biogas fuels in a 2-stroke Spark Ignition engine by determining the parameters at various throttling opening conditions. (c) Characterize and compare the engine performance of a 2-stroke spark ignition engine fueled by various biogas fuels to benchmark fuels.

Methodology

This research aimed to develop a simple method for converting a gasoline engine to biogas fuel and LPG without changing the compression ratio of the original spark engine. The fueled gasoline engine is from the specification that can easily be found in the market, and operates in 2-stroke spark ignition, air-cooled with a single-cylinder. And to determine the performance characteristics of a 2 – stroke spark ignition engine, two separate tests are carried out by the engine. First, all engine performance parameters were tested using benchmark fuels: gasoline with 2T engine oil and LPG. Second, all engine performance tests were conducted in the same gasoline engine with different biogas fuels (cow, swine, and a 1:1 mix of cow-swine manure) at various engine throttling opening positions (0 and 100%) at room temperature.

1.1 Production of Biogas

The experimental setup of the biogas system is designed to produce biogas that will be used to fuel the engine during the engine performance test. It consists of a biogas digester, gas holder and purification system of hydrogen sulfide and carbon dioxide using steel wool and water scrubbing system. The biogas system in this study is composed of three organic biomass materials: cow, swine and 1:1 cow-swine mixed manure were used separately at different technical settings in a separate anaerobic digester under mesophilic temperature, which uses ambient temperature ranges from 20°C to 45°C to produce biogas. Each collected manure weighs 50 kilograms. It will be mixed with manure to water ratio of 1:1.5. A temperature sensor and pressure sensor were used to monitor the temperature and pressure inside the biogas digester. Furthermore, because the research is a batch feeding process, no organic load was fed inside the digester. After being place in the digester, the selected manures were stirred daily. To ensure that the bacteria and the substrate were well-mixed and homogenous. Figure 1 and Figure 2 show the schematic diagram and Actual experimental setup, where the gas produced (raw biogas) was stored in the gas holder before going to the removal system. The CO2 and H2S impurities are removed using a water scrubbing system. Since H2S is highly corrosive both in the engine and to the purification system, it must be removed first in order to prevent damage. Then, the CO2 will be removed to increase the heating value of biogas fuel. A gas analyzer is used to analyze the methane content of the biogas. The methane composition of various purified biogas (cow, swine and cow-swine mixture) was analyzed using a BH-90 Henan Bosean portable infrared type methane gas analyzer capable of detecting 100% methane volume. Table 2.1 shown the Properties of biogas composition.

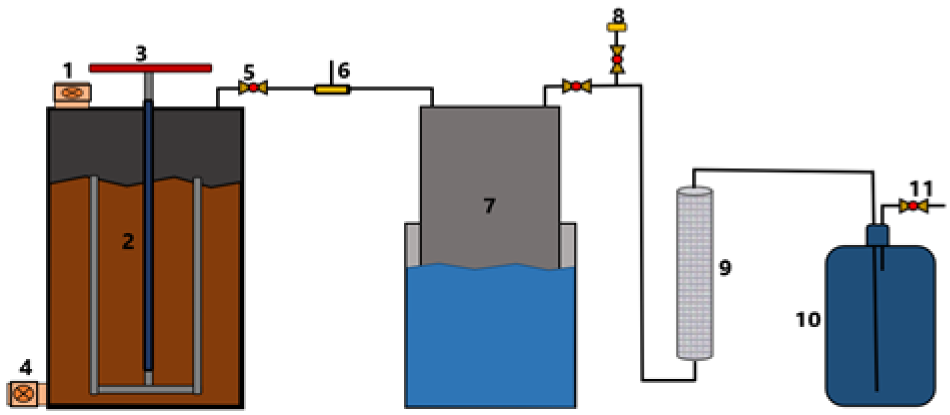

Figure 1. Schematic Diagram of Biogas System

1. Manure Inlet 2. Digester Tank 3. Stirring rod 4. Digestate Outlet 5. Gate valve 6. Pressure and Temperature Sensor 7. Floating Drum 8. Outlet for Testing Methane - Gas Analyzer 9. H2S Removal 10. CO2 Water Scrubbing Removal 11. Outlet for Testing Purified Biogas - Gas Analyzer.

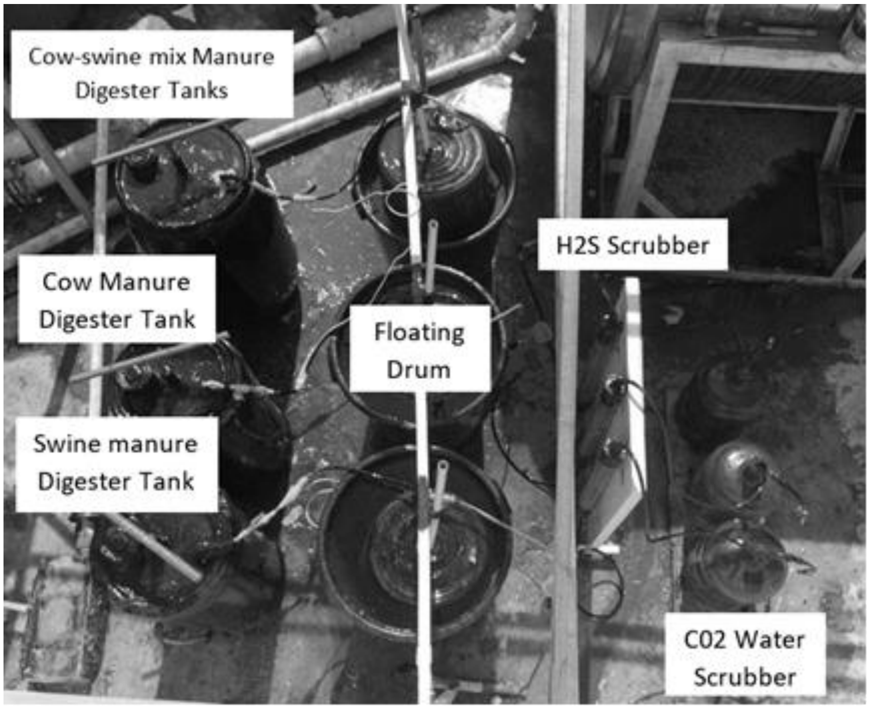

Figure 2. Actual Experimental Set – up of Biogas Production

Table 2.1. Properties of Biogas composition

Properties	Biogas from Swine Manure	Biogas from Cow Manure	Biogas from Mixture of Swine & Cow Manure
Composition (Vol. %)	CH_4 – 51% CO_2 – 49% Other gases–0%	CH_4 – 55% CO_2 – 45% Other gases–0%	CH_4 – 53% CO_2 – 47% Other gases–0%
Lower heating value at 1 atm and 15 ^oC (MJ/kg)	13.76	15.59	14.58
Density (kg/m^3)	0.671	0.671	0.671

1.2 Engine Specification

The test was carried out on a 2 – stroke engine (Fortress FPBC4300), a 43cm3, single-cylinder, spark-ignition gasoline engine with a compression ratio of 17:22. The engine used was readily available on the market. The engine's original fueling system was configured for gasoline with 2T engine oil. Since, it was desired to run on biogas, no modifications or changes were made such as spark plug gaps setting, valve clearance or fibra spacer modification, to obtain desired data with various throttling opening positions.

The engine assembly was composed of a container containing a mixture of gasoline and 2T engine oil, which was connected to the 2-stroke spark-ignition engine, and the engine's intake manifold which was connected to the gaseous fuel LPG. The DT-2234C digital tachometer and prony brake dynamometer were used to measure the brake engine speed and torque at room temperature. The engine was tested with different throttling opening positions. The Low Load throttle and High Load throttle opening position are used to gathered engine parameters. A Low Load throttle opening position is when the airflow remains constant in a fuel flow regulated to torque, whereas the High Load throttle opening position occurs when the gate of the fuel line is fully open at 100% and the accelerator is at its highest position, allowing maximum airflow in the system during suction. The engine parameters were tested and gathered for at least 10 seconds because the dynamometer used caused friction contact through slippage which can cause excessive percentage error over a longer period of time. The Fortress FPBC4300 2-stroke internal combustion engine was used to power a lawnmower. As shown, the engine's technical specifications are listed in Table 2.2.

Table 2.2. Specification of the 2 – stroke spark Ignition engine used

Engine Parts	Description
Model	FPBC4300
Engine type	Single-cylinder; 2-stroke; Air-cooled; piston valve
Volume Displacement	43cm^3
Compression Ratio	17:22
Maximum output (KW/RPM)	0.7/6500
Carburetor	Diaphragm type
Ignition system	Non-contact electronic ignition
Method of starting	Recoil type
Fuel tank capacity (L)	1.2 Liters
Maximum speed of gear shaft/ engine speed	8500/11000
Idle speed	2350 – 2900 rpm
Bore and Stroke	B = 40 mm; S = 34.2 mm

1.3 Benchmark Fuels Setup

Benchmark fuels are used to compare the performance of various biogas and alternative fuels. To determine the performance characteristic of the benchmark fuels: Gasoline with 2T engine oil and Liquefied Petroleum Gas (LPG) were used in this study. After all the data were gathered, this data was used as a benchmark for biogas fuel using various substrates and throttling openings.

1.3.1 Gasoline with 2T engine oil

The setup used a 2T engine oil as a mixture of gasoline with a fuel ratio of 30:1. It means that 30 parts of gasoline were mixed with 1 part of 2T engine oil. The engine was desired to run on various biogas fuels with no modification for easily switching back to its original fueling system and for easy conversion method of gasoline to biogas with the same throttling opening positions. At first, the test engine was run idle through 3 to 4 hours conditioning period to provide a properly “break-in” engine. Afterward, the mixture of the fresh air and gasoline with 2T engine oil were feed into the 2 - stroke engine to start the experiment with Gasoline. During the experiment the fuel tank was filled with gasoline mixed with 2T engine oil. After filling the fuel tank with exact volume, the choke was adjusted and that the throttle was placed at Low Load position. The engine was started using the manual crankshaft, and once it ignited the torque using the prony brake dynamometer was connected to the shaft and the speed of the engine are produced by using a tachometer. The speed that was gathered indicated that it had a corresponding brake torque applied with load throttle position used in the study. The same procedure was used in gathering data of High Load throttle position. The method of getting the engine brake power lasted for 10 seconds time-lapse. After performing the experiment, the engine was cooled to avoid overheating that may cause failure to engine especially the piston. All gasoline with 2T engine oil tests were completed before switching to LPG fuel and biogas fuels because the engine purchase was preconfigured by the manufacture for SI mode and originally designed to run with the mixture of gasoline and 2T engine oil. Figure 3 shows the Actual Setup of the 2–stroke spark ignition engine.

1.3.2 Liquified Petroleum Gas

For gaseous fuel, the Liquefied Petroleum Gas was used in 2 – stroke spark-ignition engine. The setup was composed of an 11-kilogram LPG tank of Pryce Gas with a mixture of 40% propane and 60% butane. The LPG fuel was connected directly to intake manifold of the 2-stroke spark-ignition engine which a weighing machine was used to measure the fuel consumption of the LPG. The gaseous fuels: Liquified Petroleum Gas and the various biogas fuels, were next to be tested after the gasoline. At first, gasoline with 2T engine oil was used to ignite the engine since the engine was not able to start with gaseous fuels. When the engine was adequately running, the fuel valve of the gasoline tank was turned off using a fuel petcock synchronizing with the opening of the LPG line valve. As the operation continues, the remaining gasoline with 2T engine oil was depleted and the gate valve of the LPG tank of the fuel line was opened to supply to the 2 – stroke engine. With this valve, the LPG flew directly to the carburetor of the combustion chamber of the engine. It was noted that during the feed of gaseous fuels, the flow rate must let at maximum to keep the gasoline engine running and then reduced until the engine was stable. The weight force of the dynamometer reads on the weighing scale in terms of kilograms to get the brake torque of the engine. Simultaneously, the tachometer read the speed of the engine in terms of RPM. The 2 – stroke spark ignition engine performance parameters were conducted with High Load throttling and Low Load Throttling conditions. The LPG had the same experimental procedure with biogas fuels when feed into 2 – stroke spark-ignition engine.

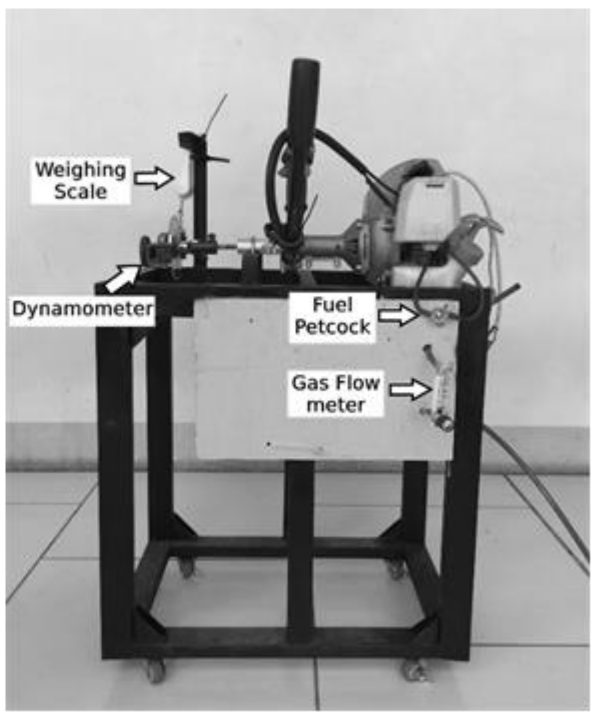

Figure 3. Actual Setup of the 2–stroke spark ignition engine

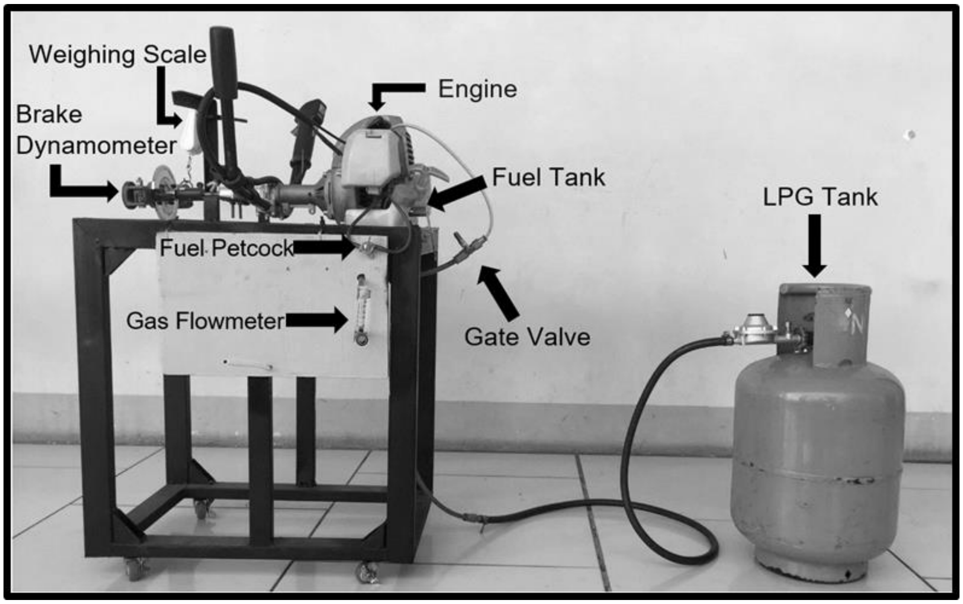

Figure 4. Actual Experimental Set – up of 2-stroke engine fueled by LPG

1.4 Engine Parameters

In conducting a performance test of an engine, different parameters were obtained. Standard engine parameters were considered for testing and investigating the performance parameters of 2 – stroke spark ignition engine. The researcher referred to the book of Engineering Fundamentals of the Internal Combustion Engine by Willard W. Pulkrabek.

1.4.1 Brake Engine Power

Torque and speed indicated the power of an engine. It is defined as a force acting at a moment's distance. It is important to determine the power since it is the indicator of rate of work of an engine (Pulkrabek, 1995).

$$P_b = 2\pi TN \quad \text{(Eq. 2.1)}$$

Where: N = Engine rotational speed, rev/s
T = Engine brake torque, N-m or Joules
Pb = Engine brake power, Watts

1.4.2 Brake Specific Fuel Consumption

Brake specific fuel consumption is the amount of fuel an engine burns per unit of mechanical work (energy) it produces. There was a need to determine the rate of fuel burnt in the engine. The lower the BSFC implies that a lesser amount of fuel is needed to generate certain power during specific time (Pulkrabek, 1995).

$$BSFC = \frac{\dot{m}_f}{P} \quad \text{(Eq. 2.2)}$$

Where: ṁf = mass of fuel/mass of biogas, kg/s
P = brake engine power, Watts
BSFC = Brake Specific Fuel Consumption, kg/kW-hr

1.4.3 Brake Thermal Efficiency

Thermal Efficiency is the ratio of the output work to the input heat. Most engines are designed with theoretical-based power (Pulkrabek, 1995).

$$\eta_{th} = \frac{P_b}{m_f Q_{HHV}} x\ 100 \quad \text{(Eq. 2.3)}$$

Where: ṁf = mass of fuel, kg/s
P = brake engine power, Watts
= fuel heating value, J/kg
= Brake Thermal Efficiency, %

Results and Discussions

This study aimed to investigate and characterize the performance of a 2-stroke spark ignition engine fueled by gasoline with 2T engine oil, Liquified Petroleum Gas and biogas from different manure mixtures (cow, swine and mixed cow-swine manure) at different throttling load.

1.5 Engine Performance of Benchmark Fuels: LPG and Gasoline with 2T engine oil

One of the objectives of this study was to determine the engine performance using benchmark fuels and biogas at the same throttling opening positions. It also aimed to show the comparison between LPG and Gasoline with 2T engine oil.

1.5.1 Engine Characteristic of Brake Engine Power and Brake Engine Speed of Benchmark Fuels

At low load throttle opening position, the LPG fuel had the highest speed from the two benchmark fuels at exactly 12,226 rpm and 0.273 Joules torque. This shows that when the performance of LPG increases, the rotational speed of the engine also increases that forced the engine to change from idle to wide-open throttle positions (Masi, 2012). The engine's original fueling system was gasoline with 2T engine oil, and the manual specified that the engine idle speed was around 3000 – 4200 rpm, but the actual brake engine speed gathered was around 2350 – 2900 rpm with a torque of 0.624 to 0.771 Joules because the spring attached to the diaphragm type carburetor was removed to prevent the engine from stopping when tightened by the dynamometer. The brake engine speed of the gasoline with 2T engine oil tends to decrease when the flywheel of the dynamometer is held tightly. And increases when the flywheel is released. When the engine was running at low load throttling position, the engine was not strong enough to grip the brake that results in a slight maintain on its rotational speed. At high load throttle position, the engine is at full capacity and needs to hold the brake tighter due to friction caused by slippage error that may stop the engine and as an effect, the engine's rotational speed increases causing the graph to oscillate. The LPG at 548.368 Watts had the highest brake engine power than gasoline with 2T engine oil. While the brake engine speed, the LPG at 14,699 rpm is higher than gasoline at 4950 rpm. According to Hotta et al., the rotational speed of the engine is highly dependent on the load applied to the dynamometer, since in both throttling positions, the LPG fuel has the highest brake engine speed than gasoline with 2T engine oil. Generally, the higher the brake engine speed obtains the higher brake power it produces and result of decrease in the brake engine torque (Chandra et al., 2011).

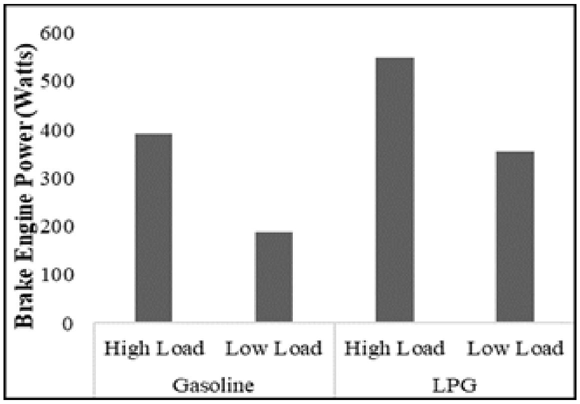

Figure 5. Engine characteristic of Brake Engine Power of Benchmark Fuels

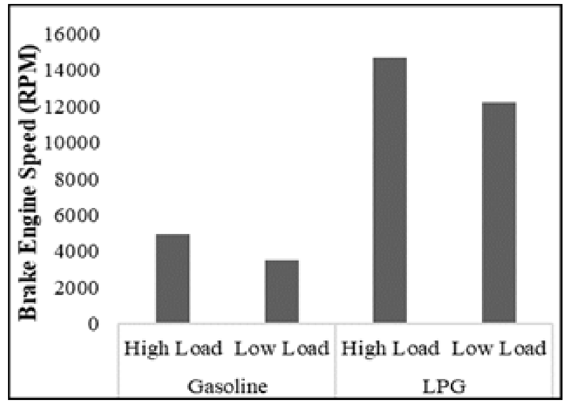

Figure 6. Engine Characteristic of Brake Engine Speed of Benchmark Fuels

1.5.2 Engine Characteristic of BSFC of Benchmark Fuels

The graph shows that the brake specific fuel consumption decreased as brake power on the engine was increased. Because the BSFC was calculated using the brake engine power and it indicates the efficiency of the engine that generates the brake power from fuel. At low load throttle, the fuel consumption was 0.016 kg/kW-h for gasoline with 2T engine oil and 0.006 kg/kW-h for LPG. There was no significant difference between the two fuels. For high load throttle position, gasoline with 2T engine oil yielded the highest fuel consumption at 0.015 kg/kW-h. As a result, at higher loads, heat loss is reduced, resulting in higher fuel consumption and better utilization to the engine (Jindal et al., 2015). According to Duc et al., the ignition delay of the engine fueled with gasoline and LPG defined as the time interval between the start of ignition and start of combustion of the engine fueled with LPG is longer than gasoline due to lower combustion rate and higher ignition point. Furthermore, when LPG is used in 2 – stroke ignition engines, the burning rate of fuel increases, and thus the combustion duration decreases. As a result, the temperature and pressure of LPG are higher than gasoline.

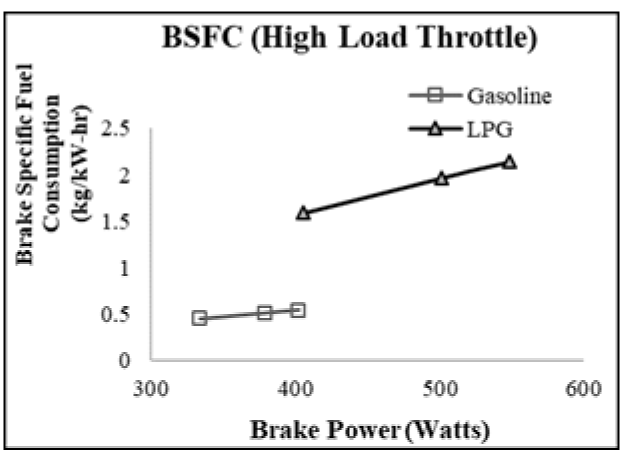

Figure 7. Engine Characteristic of High Load BSFC of Benchmark Fuels

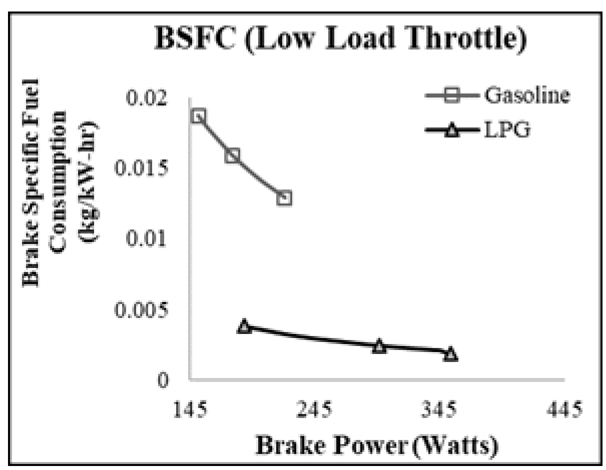

Figure 8. Engine Characteristic of Low Load BSFC of Benchmark Fuels

1.6 Engine Performance of various Biogas Fuels (Cow, Swine and mixed Cow- Swine Manure)

The anaerobic digestion in the biogas system used different biomass such as Cow Manure, Swine manure and Cow-Swine mixed manures with different setup under mesophilic temperature ranges of 25OC – 45OC to produce biogas fuel for the 2–stroke ignition engine to achieve the engine performance.

1.6.1 Engine Characteristics of Brake Engine Power and Brake Engine Speed of various biogas fuels: cow, swine and 1:1 cow – swine mix manure.

As compared to experimental data based on Reddy et al., swine manure already achieved its highest power on high load throttle at 761.485 watts, followed by cow manure and cow – swine mix manure. Under high load condition, it obtains a maximum brake engine power because the brake power developed by the engine is found to be increasing with an increase in load. An increase in loading, increases the combustion quality of the fuel, thus increasing the power output. And the brake power is just the function of engine torque and engine speed in RPM. And for the Low Load throttle position, it also shows that swine manure yields the highest power at 327.167 Watts, followed by cow-swine mixture manure and cow manure. Biogas has a comparative lower laminar flame speed and it cannot be ignited at the same crank angle of gasoline (Hotta et al., 2019). As a result, when too much fuel is injected into the engine, the engine shuts off and there is insufficient air to maintain the air-fuel mixture for the combustion process.

For the brake engine speed of the various biogas fuels at high load throttle position, the highest brake engine speed was 10,443 rpm of 0.725 Joules for swine, 10,330 rpm of 0.571 Joules for mix cow-swine manure and 9516 rpm of 0.699 Joules for cow manures. During the operation, the mixed manure substrates biogas fuel attained a stable brake engine speed that ranged from 9,500 to 10,500 rpm with applied brake torque. Therefore, the brake engine power should have an increasing trend as engine speed increases. In both throttling opening positions, both biogas fuels attained their maximum brake engine speed and decreased with the brake load increased due to the tightening of dynamometer's bolt.

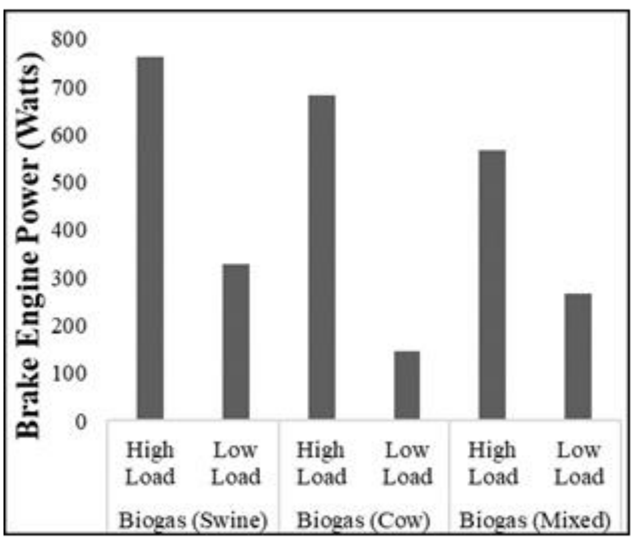

Figure 9. Engine Characteristic of Brake Engine Power of various Biogas Fuels

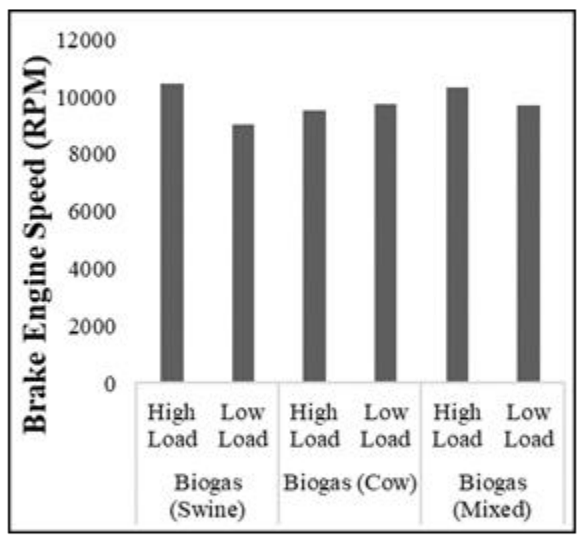

Figure 10. Engine Characteristic of Brake Engine Speed of various Biogas Fuels

1.6.2 Engine Characteristics of BSFC of various biogas fuels: cow, swine and 1:1 cow – swine mix manure

The mixed of cow – swine manure yields the highest bsfc at 1.919 kg/kW-h with 53% methane content for high load throttle opening position. The swine manure with a methane content of 51% had the lowest BSFC at 1.431 kg/kW-h. As the brake engine power increased, the BSFC also increased. As shown, the mixture of cow – swine manure had the highest brake fuel consumption for high load throttle position, but it was the least brake power engine generated, because the brake engine power is directly proportional to brake engine speed. The greater the brake engine speed, the greater the Brake Specific Fuel Consumption of a fuel. According to Arul Peter et al., the higher the percentage of purified biogas in the mixture, the higher brake specific fuel consumption due to the gaseous state of biogas. At low load throttle position, the cow manure at 2.549 kg/kW-h with 53% methane content had the highest bsfc and swine manure has the lowest bsfc at 1.127 kg/kW-h with 51% methane content. Since the 2–stroke gasoline engine ran on various biogas on low load position, the cow manure consumed more fuel than high load throttle position because as stated by Barik and Sivalingam, when the bsfc decreases with increase in engine load, the lesser fuel it required at high loads throttle position due to the increased cylinder temperature of the engine compared to low loads. Also, the bsfc is greatly dependent on brake engine power, inversely increase with brake load.

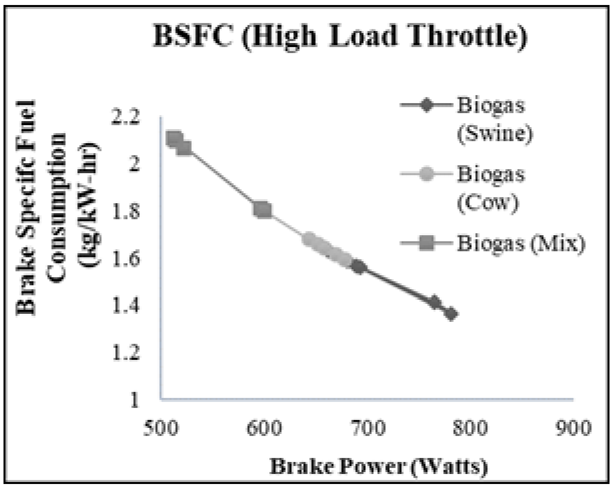

Figure 11. Engine Characteristic of High Load BSFC of various Biogas Fuels

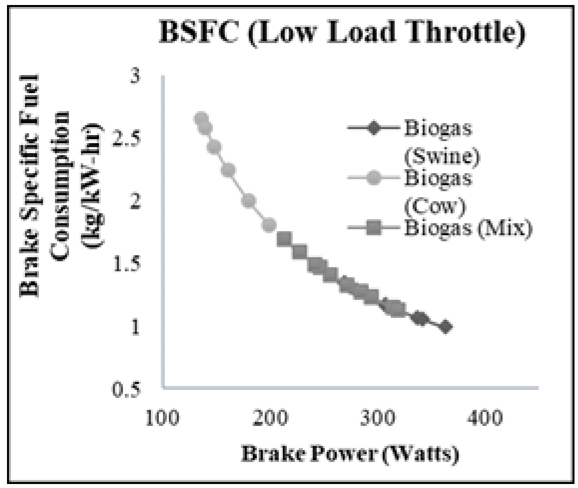

Figure 12. Engine Characteristic of Low Load BSFC of various Biogas Fuels

1.7 Comparison of Engine Performance of various Biogas Fuels and Benchmark Fuels

The main objective of this study was to determine the engine performance parameters using benchmark fuels at same throttling opening position conditions with various biogas. The conversion methods used in this research was successful and were able to run the 2 – stroke gasoline engine fueled by gasoline with 2T engine oil, various biogas and LPG.

1.7.1 Characteristics of Brake Engine Power and Brake Engine Speed of various fuels: Benchmark fuels and different biogas (cow, swine and mix manures)

Among the three fuels, the highest brake power fueled by 2–stroke spark ignition engine at high load throttle condition was the swine manure biogas at 761.485 Watts. And the least brake engine power was gasoline with 2T engine oil at 392.888 Watts. While on Low Load throttle position, the maximum brake power output of the engine operated are 353.872 Watts of LPG. Generally, the brake engine power increases with an increase in brake engine speed. Since the various biogas fuels and LPG are injected directly into the intake manifold, a large volume of intake air will be replaced by both gaseous fuels when tested. Compared to gasoline with 2T engine oil, gaseous type fuels have a better mixture formation that resulted an increase of heat release rate, increase in cylinder temperature and increase in cylinder pressure that contributed to a complete combustion process of the engine (Duc and Duy, 2018). The trend of the graph gave a clear advantage of use of purified biogas in engine operation for better power output over raw biogas and other benchmark fuels. While for brake engine speed, the various biogas fuels (cow, swine, cow-swine manure mixture) had almost the same trend of brake engine speed ranges from 10,500 rpm to 9,000 rpm. On the other hand, gasoline with 2T engine oil yield the lowest brake engine speed at 4950 rpm compared to LPG at maximum of 14,699 rpm. It was found that biogas has a lower calorific value and has a lower combustion quality than LPG, resulting in variation of engine speed. As a result, engine speed decreased by 25.67% at high load throttle position and 27.06% at low load throttle opening position when operating in purified biogas.

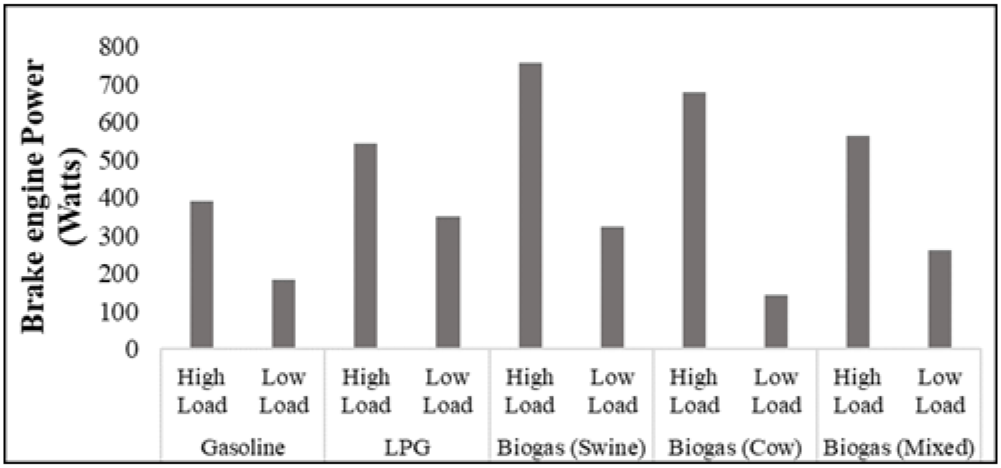

Figure 13. Characteristic of Brake Engine Power

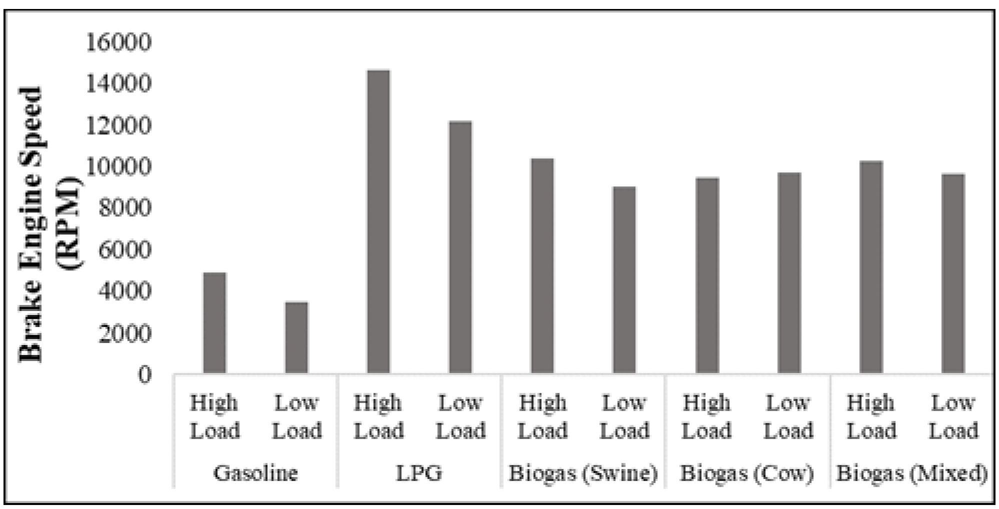

Figure 14. Characteristic of Brake Engine Power

1.7.2 Characteristic of Brake Specific Fuel Consumption Characteristics of various fuels (Benchmark fuels and different biogas)

The highest brake specific fuel consumption rates of the engine are run with purified biogas at 1.919 kg/kW-h of cow-swine manure mixtures for high load throttle position and 2.549 kg/kW-h of cow manure for Low Load throttle position. The BSFC of purified various biogas consume more fuel than benchmark fuels because LPG is 8% more efficient on SI engines (Smith et al., 1997) due to its higher-octane number, auto ignition temperature, great flame velocity and wider flammability limits that make the LPG a better fuel in spark-ignition engine (Erkus et al., 2013). At the same time, gasoline with 2T engine oil operates on its original fueling system with natural aspiration on the engine. In comparison to biogas, the higher the percentage of purified biogas in the mixture, the higher brake specific fuel consumption due to the gaseous state of biogas that attributed incomplete combustion due to suction of biogas-air mixture instead of air in the inlet manifold (Prabhu et al., 2018).

Figure 15. Characteristic of BSFC

3.3. Characteristic of Brake Thermal Efficiency Characteristics of various fuels (Benchmark fuels and different biogas)

The brake thermal efficiency is used to evaluate the engine that converts the heat input of the fuel into mechanical energy. In both throttling positions, the swine manure biogas at 18.45% yields the highest brake thermal efficiency compared to benchmark fuels at 1.41% of LPG fuel. This is due to the high methane concentration of purified biogas, the BTE on both throttling opening positions are higher than benchmark fuels because biogas has a lower thermal value than gasoline. Furthermore, LPG has a lower thermal value than gasoline in terms of mass but, in terms of volume, the lower thermal value of gasoline is greater than LPG. This indicates that more fuel must be required to achieve the same movement. As a result, LPG and biogas have higher BSFC values than gasoline. Since the fuel consumption rate are kept constant at minimal consumption and the calorific value of biogas are kept lean, BTE that depends on combustion quality increases due to increased frictional losses (Reddy et al., 2016).

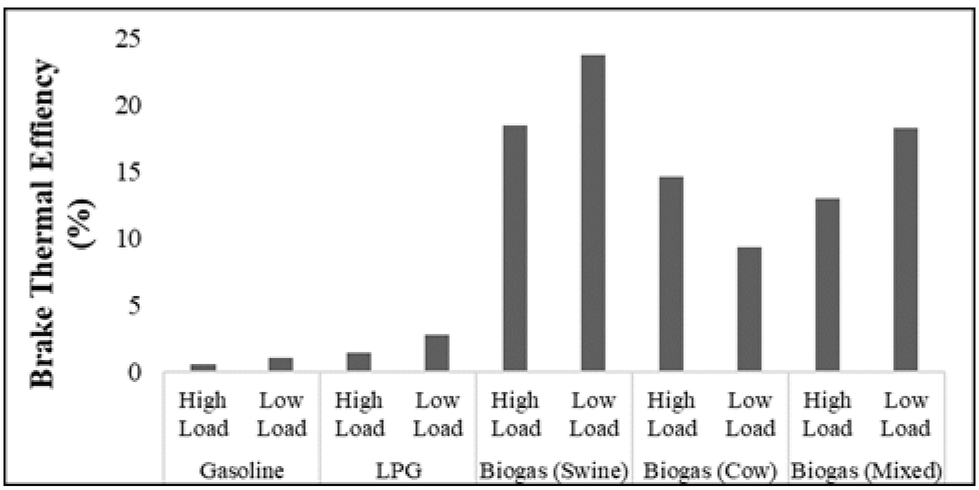

Figure 16. Characteristic of Brake Thermal Efficiency

Conclusion and Recommendations

The engine performance characteristic of a 2–stroke spark-ignition engine was compared with various biogas (cow manure, swine manure, mixed cow-swine manure) and benchmark fuels (LPG and Gasoline with 2T engine oil) under different throttling opening positions (High load throttle and Low Load throttle opening positions) for comparative characteristics. The following conclusion are derived: (1) The benchmark fuels at both throttling opening positions, the LPG achieved the highest parameters of 548.368 Watts of brake engine power, 14,499 rpm for brake engine speed, 0.003 kg/kW-h for BSFC and 1.41% for brake thermal efficiency. Because gaseous fuel for SI engines has a higher self-ignition temperature, resulting an increased engine parameter; (2) From the three-manure used to run in a 2–stroke gasoline engine, the swine manure biogas achieved the highest engine parameters at 761.485 Watts, 10,443 rpm for brake engine speed, 1.431 kg/kW-h for BSFC and 18.46% for brake thermal efficiency. The conversion from gasoline to purified biogas fueled engine is successful and able to run in a 2–stroke spark ignition engine for small scale operation; (3) The engine ran with stability and was able to achieve the engine parameters that were required in this study for comparative of benchmark fuels to various biogas in both throttling opening positions (Low load throttle and High load Throttle). From the various fuels compared, the biogas almost acquired the highest engine parameters fueled in 2-stroke spark-ignition engine in terms of brake power and brake thermal efficiency compared with Liquified Petroleum Gas attained the highest brake engine speed at all throttling opening position. Biogas can be a viable option as an alternative fuel for 2–stroke spark-ignition engines and spark-ignition engines in rural areas as the performance of the engine using biogas is considerably identical and compared to gasoline fuels and LPG. It is recommended that future studies on different pressure from optimal operating pressure to lower pressure for all fuels to be tested in 2–stroke spark ignition engine at different throttling opening positions. And to get the exhaust emission composition of the engine fueled by different fuels at different throttling positions. Also, future studies on biogas fuel compression for commercial purposes.

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A New Opportunity for Effective Standardized Facilities Management System for SUCs utilizing QR Code Technology

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Abstract - The study covered the following: elaboration concerning the existing processes used in the facility management of SUCs; a proposed standardized process for facility management using Quick Response Codes; the level of assessments, agreement, and acceptance on the inclusion of QR codes and cloud computing for university facility management, and a system prototype.

The purpose of the study is to create a system prototype that follows a standardized process and implements the QR code system for timely updates and to determine the level of acceptance for the proposed process and its features. The study intends to provide a solution to the difficulty that Philippine SUCs are currently facing. With research and development, an answer shall be produced in the form of a system prototype that integrates with technologies that shall ease the strain that decentralized and paper-based management brings.

Keywords - Facilities; Prototype; QR Code; SUCs; Web-based

Introduction

QR codes are 2-dimensional codes which contain data such as links, images, texts, or IDs that may be of different data types – even plain texts. It has a fairly larger data size capacity than that of barcodes and instead of using it for asset management only, QR codes may also be used for advertisement, even party games, reservations, or any other activity.

As mentioned, QR codes can be used in asset management. The essential question is why should one use these? The answer is that QR codes are easy-to-use, quicker, and versatile. Not only can these codes be designed to fit a company's color or logo if the company wishes to, but these are also flexible and adaptable.

With the involvement of QR code scanning for asset management and the implementation of cloud computing for computer transactions in mind, information management systems, facilities management systems specifically, may come to mind. The scanning process of QR codes in mind, it has been said that Information Technology has taken every aspect of the humans' daily lives from craft to leisure and even culture (Olmo, 2015) and one of the gifts of IT is the mobile devices. Mobile devices are close to being limitless at the present time and one of the things it can be is a scanner; particularly, a barcode scanner. Instead of buying a barcode scanner which is more costly and limited, one can use his/her mobile phone to scan a QR code and see its value if the need arises.

The Philippine State Universities and Colleges (SUCs) such as PNU, PUP, and CatSU have systems to manage their facilities and allow both insiders and outsiders to reserve these facilities. In this study, the researcher referred to PNU as SUC1, PUP as SUC2, and CatSU as SUC3.

SUC1 uses a semi-automated facility reservation system. SUC2 and SUC3 uses a paper-based facility management system. Although it delivers what it has to deliver – that is to allow reservations –, based on the interviews conducted, there are gaps and difficulties such as: decentralization, untimely management and tracking, and untidy organization.

The decentralization of the SUCs processes led to the researcher on the problems to be sought like of: untimely management and tracking, and untidy organization. Using the concepts exposed earlier, the QR code system, cloud computing, and the SUCs, the researcher conceptualized a solution that will help ease these problems. Through benchmarking, the researcher looked for a pattern in the processes used by the aforementioned SUCs to create a standardized process for facilities management systems that assists in keeping requests organized, which are on the cloud to support centralization, and with the implementation of the QR code system, a timely clock-in and clock-out of the facilities borrowed shall be recorded.

It is the goal of this to create a system prototype that follows a standardized process and implements the QR code system for timely updates and to determine the level of acceptance for the proposed process and its features.

Methodology

The researcher used the form of investigation by using the descriptive-developmental method. SUC3 is the university that has been chosen for the pilot testing of the solution. This university is located in the Bicol Region of Luzon where it is frequently hit by typhoons. With this in mind, the use of a Business Contingency Plan (BCP) is needed to support the operation and performance of system in case of there is no electricity and/or there are problems with internet services. As mentioned, the study used the descriptive-developmental method of research in achieving the requirements needed in the investigation of the study. With the aid of this method, the researcher was able to make the analysis and the development of the system.

Developmental method was used since the study is looking for a better solution to an existing traditional system. It is appropriate to the study since this method includes a fact-finding way of acquiring data with adequate interpretation. It also enables the researcher to analyze and learn the different transactions done.

Results and Discussions

The result of the study is presented in the in five parts. The first part presents the existing facilities management processes for State Universities and Colleges (SUCs). The second part presents the proposed standard process that is the QR-Based Solution. The third part gives the level of assessment of the respondents in having a standard automated process for a QR based Facilities Management for State Universities and Colleges. The fourth part describes the respondents' level of agreement on the benefits of adopting QR codes in monitoring the facilities of a University. The fifth part looks into the respondents' level of acceptance on the inclusion of the different functionality features for a University Facility Management that has provisions for public use.

1. Existing Process of the three (3) SUCs

The existing process of SUC1 has different ways of treating different categories of activities; the categories of activities are: Faculty-initiated Activities, Student-initiated Activities, and Outsider-initiated Activities.

The Faculty-initiated Activities are used to categorize the University offices who wish to use the venues for special events and programs. Student-initiated Activities are from the student organizations/classes; and Outsider-initiated Activities are for the outsiders who wish to use the venues for their activities. Per initial gathering of data, the researcher learned that SUC1 prioritizes outsiders' requests for it brings the university/college bigger income compared to that of student and/or faculty-initiated activities. Say there was a student/faculty-initiated activity which was booked prior to the event of the outsiders requests, the former activity will be moved to other venues or dates.

SUC2 has no centralized procedure being implemented on the use of the facilities. SUC2 has three major procedures in the use or in requesting facilities, namely: SUC2 Oval, vehicles, and other facilities such as: Audio Visual Room (NLRC), CM Recto, Bulwagan Balagtas, Bulwagan Bonifacio, Freedom Park, and Amphitheatre under the supervision of CDMO (Campus Development and Maintenance Office). Among the three SUCs, the case of SUC2 is different due to the fact that its oval facility has sub-facilities; the sub-facilities include a gymnasium, and an open court which also contains several facilities inside it such as 2 volleyball courts, 2 basketball courts, lawn tennis, and swimming pool which are all under the supervision of the College of Kinetics.

The SUC3 has a similar process when it comes to facility management with SUC2, both have decentralized procedures being implemented and both uses a manual process in booking requests to returns. Other similarities with regards to the process with the SUC2, which the priority of use, shall be for instructional, academic, and other related activities. Handling and supervision of vehicle request are under Motorpool department, whereas, several venues that are under the management of the Supply Office and other facilities are with the Supervising Administrative Office (SAO).

2. Standard Process with QR based solution

On the proposed standard process with QR-based solution, there are four main actors, the requestor, the system itself, staff/checker and the approver/s. The requestor may visit the website to check the availability of the facilities on the e-calendar. After checking the availability of the facilities, the requestor may fill up and submit the form. Upon submission of the requestor's information online, he/she will receive a confirmation code (a 6 character-code that is a combination of alphanumeric characters); the system will notify the approver/s via email.

For the evaluation of the reservation, there will be a set of approvers - depending on the type of requestor, whether he is an outsider or from the academe/teaching or administrative /non-teaching group – that the reservation will be routed to. The result of evaluations and the round-the-clock tracking of the request will be seen by the requestor online. There is an allotted time for each request, as stated in the Republic Act No. 9485 “An Act to Improve Efficiency in the Delivery of Government Service to the Public by Reducing Bureaucratic Red Tape, Preventing Graft and Corruption, and Providing Penalties Therefor”. This act promotes integrity, accountability, proper management of public affairs and public property as well as to establish effective practices aimed at the prevention of graft and corruption in government. That if all applications and/or requests submitted shall be acted upon by the assigned officer or employee during the period stated in the Citizen's Charter which shall not be longer than five (5) working days in the case of simple transactions and ten (10) working days in the case of complex transactions from the date the request or application was received.

Once the final signatory/approver approved the request, an email will be sent to the requestor's email account. Notifying the requestor that the facility/ies requested is ready for claiming. Other than the approval process, the final approver also has the authority to close reservations upon or after the end date has been reached.

Upon claiming, the requestor shall bring a proof of identity and the reservation code (written in paper, saved as note on a mobile phone, or memorized). The Staff/Checker shall enter the reservation code and evaluate. Once matched, the Staff/Checker may select the facility to claim and set its status to claimed/unavailable.

After the event, the requestor shall return the facility's key, on which the QR code is attached. The QR-codes shall be used in system for asset management and not the reservations per se. For facilities that do not require keys such as the oval, open field courts, pool and alike are still covered from this requirement. Thus, in replacement for the keys requirement, issuance of the QR code tag attached to cards will be made.

For the return of the facilities, the Staff/Checker shall scan the QR code tags and input the remarks and findings on the return status (such as: returned, damaged and lost) based on the ocular inspection.

This procedure can be seen in Figure 1 Proposed Standard FRS – Reserve and Approve and Figure 2, – Proposed Standard FRS – Claim and Return

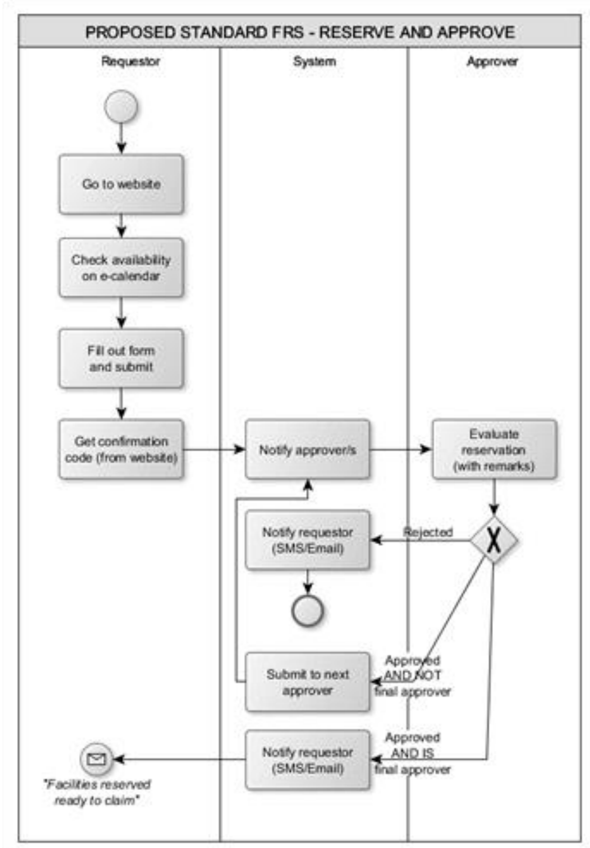

Figure 1
Proposed Standard FRS – Reserve and Approve

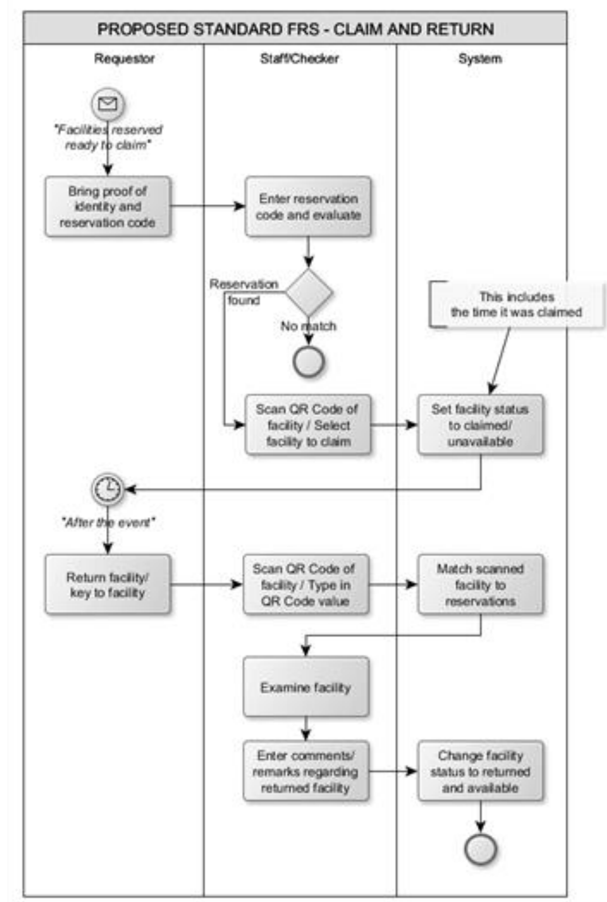

Figure 2
Proposed Standard FRS – Claim and Return

The figure on the next page shows the use-cases of the proposed facility management system with standardized process.

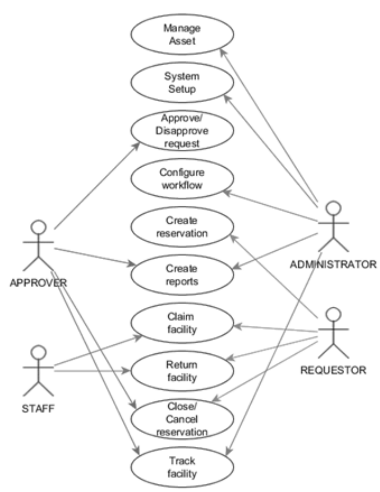

Figure 3 Use-Case Diagram for the Proposed System

As shown above, the Administrator has five use-cases that include asset management, system setup, workflow configuration, reports generation, and facility/asset tracking.

Same with the Administrator, the Approver has the same ability to view/track facilities and other SUC's assets but unlike the Administrator, the Approver has a bigger influence in request approval for he/she has the final say and/or the authority to approve/disapprove request/s; including the power to close or cancel facility reservations.

Once a request has been approved, the claiming and return of facilities will be under the supervision of the Staff/Checker. He/she has the authority to tag/put the status or findings of the borrowed facility/ties during inspection. The Staff/Checker may state the following notations: returned, damaged and lost.

3. Respondents' Level of Assessment in Having a Standard Automated Process for a QR Based Facilities Management for State Universities and Colleges

The respondents' assessment on the effects in having a standard automated process for a QR based Facilities Management for State Universities and Colleges is very strong.

The details of the interpretation are presented in detail in table 1 with its mean, interpretation, and fractional ranking.

Table 1
Respondents' Level of Assessment in having a standard automated process for a QR based Facilities Management for State Universities and Colleges

STATEMENT	MEAN RESPONSE	INTERPRETATION	RANK
1. With the proposed automated system, transactions/requests for the use of the facilities/services are captured, recorded, and traced electronically; hence, this will help in promoting, transparency in the government.	3.67	Very Strong	7.5
2. With the use of the automated system, this would expedite and streamline processes.	3.71	Very Strong	5.5
3. Such automation for facilities/services, requests would be an aid for the decision-making process.	3.53	Very Strong	10
4. Such strong system will increase the productivity of the users and economy on the part of the institution since this would be a paperless transaction.	3.73	Very Strong	3.5
5. The system will become a breakthrough in the advancement of the way transactions/requests are forwarded and monitored; that will eliminate traditional routing slip.	3.73	Very Strong	3.5
6. The proposed automated system encourages digital literacy among the users.	3.71	Very Strong	5.5
7. The proposed automated system will need support of the administration in terms of finance and	3.67	Very Strong	7.5

preparation/training on the part of the users for it to be implemented and utilized successfully.			
8. Administrative problems *mañana habit*, *ningas cogon* or other work attitude excuses of the government employees will be addressed or minimized since tracking of procedures/requests will be made on-time.	3.56	Very Strong	9
9. The proposed automated system supports a paperless environment, reducing untidiness in the workspace and it also help avoid the misuse/simple corruption of resources in the workspace.	3.76	Very Strong	1
10. The proposed automated system encourages the government to allot reasonable budget for electronic/cloud-based procedures and advancement for employees.	3.75	Very Strong	2
OVERALL MEAN	**3.68**	**Very Strong**	

4. Respondents' Level of Agreement on the benefits of adopting QR codes in monitoring the facilities of a University

The respondents' agreement on the benefits of adopting QR codes in monitoring the facilities of a University is presented in table 2 with its mean, interpretation and fractional ranking.

As seen in the table, the respondents strongly agreed that the adoption of QR codes in monitoring the facilities of a University will be beneficial based on the obtained overall mean assessment of 3.64.

The QR codes' ability to store a variety of data ranked first, has a mean of 3.73, respondents strongly agreed that it will be beneficial.

The QR codes including an Error Correction Level (ECL) that enables "damaged" codes to still be scanned ranked equal with the QR codes' versatility to be customized artistically at rank 2.5 with the mean of 3.64, interpreted as strongly agree.

The tools to generate and read 2D barcodes such as QR codes being free and management tools being available to track scanning analytics tied at rank 4.5 with a mean of 3.62 and interpreted as strongly agree.

Lastly, "QR codes can be placed in and on nearly any location" and "mobile barcode scanning is on the rise" ranked equal at 6.5 with a mean of 3.60 and interpreted as strongly agree.

The respondents strongly agreed on the benefits of QR codes and the items that have "Strongly agree" as interpretations are the same with the ones discussed as the benefits of QR code in articles and studies from Probst et al. (2012), Patel (2012), Johnson (2011), Tolliver-Walker (2012), Carmine (2012), Küçükaltan et al. (2014) such as: data types, low cost maintaining, tracking and identification, interactive, and branding approach.

All the items were marked as "Strongly Agree" which can be interpreted as: QR codes are highly beneficial for facilities monitoring. The QR code's feature to store a variety of data ranked first because of all the items in the list, this is the most obvious weakness of the current facilities management systems – being able to store a variety of data in facility tags.

Table 2
Respondents' Level of Agreement on the benefits of adopting QR codes in monitoring the facilities of a university

STATEMENT	MEAN RESPONSE	INTERPRETATION	RANK
1. Can Store a Variety of Data	3.73	Strongly Agree	1
2. Can be Placed in and on Nearly Any Location	3.60	Strongly Agree	6.5
3. Tools to Generate and Read 2D Barcodes such as QR codes are *Free*	3.62	Strongly Agree	4.5
4. Mobile Barcode Scanning is on the Rise	3.60	Strongly Agree	6.5
5. Management Tools are Available to Track Scanning Analytics	3.62	Strongly Agree	4.5
6. QR codes include an Error Correction Level (ECL) that enables "damaged" codes to still be scanned.	3.64	Strongly Agree	2.5
7. QR codes can be Customized Artistically	3.64	Strongly Agree	2.5
OVERALL MEAN	**3.64**	**Strongly Agree**	

5. Respondents' Level of Acceptance on the Inclusion of the Different Functionality Features for a University Facility Management that has Provisions for Public Use

The respondents' level of acceptance on the inclusion of the different functionality features for a University Facility Management that has provisions for public use is presented in table 9 with its mean, interpretation, and fractional ranking.

As seen in the table, the respondents found the inclusion of the different functionality features for a University Facility Management that has provisions for public use highly acceptable; this is revealed by the obtained overall mean assessment of 3.76.

Table 3
Respondents' Level of Acceptance on the inclusion of the different functionality features for a University Facility Management that has provisions for public use

STATEMENT	MEAN RESPONSE	INTERPRETATION	RANK
1. It can upload written electronic request from the requestor.	3.73	Highly Acceptable	9.5
2. It can send written requests to the recommending and approval signatories.	3.73	Highly Acceptable	9.5
3. It can let the requestor view the availability of the venue/service requested through the calendar.	3.71	Highly Acceptable	11
4. It can update booked requests and delete cancelled reservations on the calendar.	3.67	Highly Acceptable	13
5. It can update the requestor's request status or update on real time.	3.78	Highly Acceptable	5
6. It can upload written electronic request from the requestor.	3.73	Highly Acceptable	9.5

7. It can send written requests to the recommending and approval signatories.	3.73	Highly Acceptable	9.5
8. It can show remarks or causes of delay on the approval status.	3.75	Highly Acceptable	7.5
9. It can display signatories' action on the request.	3.75	Highly Acceptable	7.5
10. It can print and view of transactions any time.	3.76	Highly Acceptable	6
11. Standardized, organized and indexed storage facility management request.	3.84	Highly Acceptable	1.5
12. Interconnectivity/centralized information system for the facility request.	3.84	Highly Acceptable	1.5
13. Centralized and secured records keeping of requests and transactions.	3.80	Highly Acceptable	4
14. There is a separate account and scope/module for administrator, request signatories and user/requestors promoting control in access and system security.	3.82	Highly Acceptable	3
OVERALL MEAN	**3.76**	**Highly Acceptable**	

Conclusion and Recommendations

The study has drawn the following conclusions based on the findings plotted by the researcher:

Based on the benchmarking conducted, it can be concluded that with the semi-automated process used by SUC1 and the manual process used by SUC2 and SUC3, challenges specified in the study are truly experienced by the organizations; that being decentralization, strenuous routing of signatories, untimely and untidy management and tracking of facilities request.

It is concluded that the developed Facilities Management Solution is functional and reliable. It supports a paperless environment which may minimize simple acts of corruption in the workspace like the misuse of resources and time. With this said, it can further minimize corruption because of the solutions turn-around time monitoring for approval feature wherein requestors can transparently view the time consumed by approvers during the approval process. Finally, it supports/answers the general problem such as decentralized paper-based management.

The researcher found that adopting QR Codes for monitoring facilities of a university is very beneficial. It is found that the capability of storing variety of data is the most beneficial, and capability of being placed in and on nearly any location is the least beneficial.

Overall, the researcher found that the inclusion of different functionality features for a university facility management is highly acceptable. It has been concluded that having a standardized, organized and indexed storage facility management request and a centralized information system of facility request is most acceptable amongst the features.

The researcher concluded that with the inclusion of highly recommended features in the current process, a more robust automated and more streamlined Facilities Management of State Universities and Colleges will be created.

The following recommendations are offered:

It is suggested that the system should be deployed in a cloud-based environment in order to establish a more accessible and centralized information system.

It is recommended that the solution is used constantly once implemented in order to create a sense of familiarity. With this, the user will be able to use it with ease and through time and correct usage, the solution will be able to aid the entire organization in terms of productivity, economy, and even aid in creating better decisions for the area of facilities management.

It is recommended that the future researchers and developers exploit the QR code system and put its other capabilities to use in facilities management in a manner that it will be usable and beneficial.

It is suggested that other features will be included in the system or allow the integration of other sub-systems like that of billing or the integration of mobile applications to make the FMS' functionalities more robust.

It is suggested that other than the incorporation of predictive maintenance feature, the incorporation of SMS notification to the requestors to support a quicker and easier notification process be added as well.
The use of Business Contingency Plan (BCP) is highly advised to support the operation and performance of system in case of there is no electricity and/or there are problems with internet services (such as cloud storage troubles; and slow bandwidth rate) like of the case of SUC3.

The use of webcam of scanning is also an alternative. However, for more stable and effective scanning, the use of a 2D barcode scanner is better, though it is more expensive.

There should be close monitoring of facilities, venues and equipment for tagging of remarks/findings after return, to attain the degree of accuracy in its real time.

Acknowledgement

Above all, the researcher gives thanks to the Lord Almighty for making her feel grateful. She likewise thanks her colleagues in CatSU-CICT headed by Dean Acedo and the former Dean Vera, her mentor Dr. Rosicar E. Escober, her friends Mr. Jason Fama, her family and to her lucky charm, Yuan.

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Ultrasonic Blind Stick

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Abstract - This developmental research aimed to design, develop, and test an Ultrasonic Blind Stick to help visually impaired people. It contained the technical features: obstacle detection and multiple sensors utilization. It also aimed to test its quality in terms of stability, functionality, reliability, cost-effectiveness, and sensory; and to develop a user's manual. The respondents of the study consisted of ten electronics engineers, fifteen engineering students, and five visually impaired persons from the Home for the Blind Community. The data gathering process began with a written request to the City Government Office of Bacolod through the Department of Social Services & Development (DSSD) which sought the approval to conduct the study at the Home for the Blind, and the Dean of the College of Engineering to conduct the study in the institution. The study utilized a researchers'-made research instrument, which recorded a validity rating of 4.33 and a reliability rating of 0.95, making it valid and reliable. Results revealed that the distance of the prototype from the obstacle should be between 0.1 and 0.7 meters to provide accurate detection. The water sensor buzzes if there is a puddle of water, and as the distance of the prototype from an obstacle decrease, the frequency of tone produced by the buzzer increases. The quality dimensions: functionality, reliability, and sensory, were interpreted as excellent according to the evaluation of visually impaired people; all quality dimensions from the professionals; and only cost-effectiveness was interpreted as very satisfactory based on the evaluation of the students.

Keywords - Ultrasonic Blind Stick, visually impaired people; Home for the Blind Community; Department of Social Services & Development; Quality dimensions

Introduction

Vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight (Pangavhane, Patil, More, Kulkarni, 2016). The conventional and oldest mobility aids for persons with visual impairments are characterized by many limitations. World Health Organization (2018) stated that globally it is estimated that approximately 1.3 billion people live with some form of vision impairment. Over the years, the walking cane has been the most common tool that visually impaired people use to navigate and detect obstacles (Nowshin, Shadman, Joy, Aninda & Minhajul, 2017). Today's technology is improving daily aspects to provide a flexible and safe environment for visually impaired people.

Previous studies focused only on developing a smart walking stick using ultrasonic sensors and buzzers to aid visually impaired people to navigate, but so far, there have been few studies conducted which attempted to incorporate a water detector sensor and wireless remote. This prompted researchers to develop a new technology that would aid visually impaired people, a technology that is user-friendly and would enhance guidance to them.

This study aimed to provide an alternative to the traditional walking stick. The developed blind stick intends to provide accurate detection of objects and guide the visually impaired person accordingly. The blind stick was integrated with ultrasonic sensors along with a water detector sensor. The study utilized ultrasonic sensors to detect obstacles in three directions (front, right, and left) using ultrasonic waves and a water detector sensor to detect puddles of water. These sensors were installed on a cane, and a roller was installed on the cane to provide convenience for the visually impaired person. On sensing obstacles, the sensor passes data to the microcontroller. The microcontroller then processes this data and checks if the obstacle is within the vicinity of the visually impaired person. Once an obstacle is detected, the buzzers would produce distinct tones for each direction (front, left, and right). Likewise, the frequency of tone would increase as the distance of the obstacle decreases. Moreover, a different buzzer would be triggered if puddles of water were detected and would produce a different tone. Furthermore, a wireless-based remote was also integrated to help visually impaired persons find their blind stick if they forget where they kept it. It is along with these premises that a study of this nature was conducted.

Objectives of the Study

Generally, this study aimed to design, develop, and test an Ultrasonic Blind Stick.

Specifically, this study sought to:

1. Design and develop an Ultrasonic Blind Stick with the following technical features:
   a. Obstacle detection; and
   b. Multiple sensors utilization
2. Test the quality of the Ultrasonic Blind Stick in terms of:
   a. Stability;
   b. Functionality;
   c. Reliability;
   d. Cost Effectiveness; and
   e. Sensory
3. Develop a user's manual

Methodology

This quantitative study employed a developmental method of research to design, develop, and test an Ultrasonic Blind Stick. Similarly, this study emphasized the technical features: obstacle detection and multiple sensors utilization as the design criteria. This study has also employed the procedures: planning, designing, assembly, testing, and maintaining to ensure the successful designing, development, and testing of the prototype with excellent quality.

First, the planning stage began with deciding what electronic components and modules would be used for the security and power supply of the prototype. This stage also included the drafting of the possible physical layout of the prototype. Second, the designing stage involved the creation of the general layout of the prototype, intense analysis of the design conditions and assumptions, identification of the possible key parameters, comparison, and analysis of different materials suited for the prototype, block diagram of the study, the parts and function of the prototype, and the flowchart of the prototype.

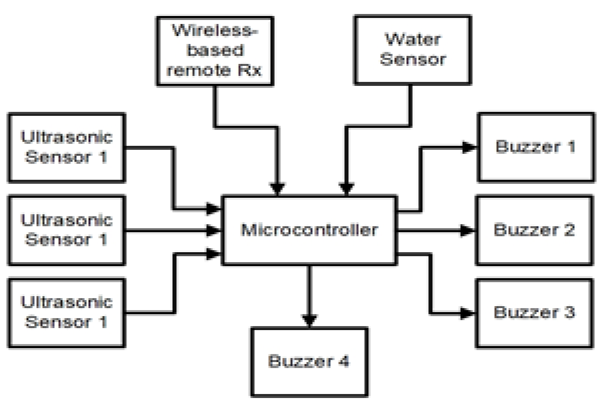

Figure 1. Block Diagram of the Study

As shown in figure 1, the microcontroller was used for controlling the sensors. Waterproof ultrasonic sensors were utilized as a proximity sensor to detect obstacles which would then assist the visually impaired person in navigating. Likewise, the water sensor was utilized to notify the visually impaired person if there is a puddle of water near the visually impaired person.

Third, the assembly stage emphasized the preparation of the tools, equipment, and materials that were utilized in the development, construction, and installation of the components of the prototype. Fourth, the testing stage focused on the continuity of electrical connections, testing for component failures, and initial quality testing. And fifth, maintaining stage involved the periodic checking of the connections of components of the prototype.

Evaluation Procedure and Data Analysis

The evaluation process began with a written request to the City Government Office of Bacolod through the Department of Social Services & Development (DSSD) which sought the approval to conduct the study at the Home for the Blind and the Dean of the College of Engineering to conduct the study in the university. Moreover, the researchers conformed to the ethical requirements of research during the conduct of the study.

The mean was utilized to assess the quality of the prototype. There were five scales to interpret the quality of the prototype. As such, a mean scale of 4.21 – 5.00 was interpreted as Excellent; 3.41 – 4.20 as Very Satisfactory; 2.61 – 3.40 as Satisfactory; 1.81 – 2.60 as Poor; and 1.00 – 1.80 as Very Poor.

Research Instrument, Validity, and Reliability

The researchers developed a researchers'-made survey questionnaire. The survey questionnaire was a 25-item instrument, which employed a 5-point Likert scale to the stability, functionality, reliability, cost-effectiveness, and sensory of the prototype, wherein 5 = Very Agreeable, 4 = Agreeable, 3 = Fair, 2 = Not Agreeable, and 1 = Not Very Agreeable. Moreover, the contents of the instrument underwent content validation by a panel of evaluators comprising experts in the field of Electronics Engineering and the English language. With a validity rating of 4.33 over 5.00 using the criteria set forth by Carter V. Good and Douglas B. Scates, it was declared valid. Similarly, Cronbach alpha was utilized to determine the reliability of the instrument. Test value established an alpha value of 0.93, making the researchers'-made research instrument very reliable.

Respondents of the Study

The respondents of the study consisted of ten (10) experts in the field of Electronics or any other related fields, fifteen (15) Engineering students, and five (5) visually impaired persons from the Home for the Blind Community. Also, the instrument was administered for three (3) weeks. Moreover, the researchers utilized convenience sampling to provide easy and fast data collection.

Results and Discussions

The first objective of the study was to design and develop an Ultrasonic Blind Stick with the technical features – obstacle detection and multiple sensors utilization.

Table 1. Functionality Test of the Prototype

Ultrasonic Sensor 1 Detected?	Ultrasonic Sensor 2 Detected?	Ultrasonic Sensor 3 Detected?	Distance 1	Distance 2	Distance 3	Buzzer 1	Buzzer 2	Buzzer 3
✓	×	×	<0.7m	>0.7m	>0.7m	✓	×	×
×	✓	×	>0.7m	<0.7m	>0.7m	×	✓	×
×	×	✓	>0.7m	>0.7m	<0.7m	×	×	✓
✓	✓	×	<0.7m	<0.7m	>0.7m	✓(1st)	✓(2nd)	×
×	✓	✓	>0.7m	<0.7m	<0.7m	×	✓(1st)	✓(2nd)
✓	×	✓	<0.7m	>0.7m	<0.7m	✓(1st)	×	✓(2nd)
✓	✓	✓	<0.7m	<0.7m	<0.7m	✓(1st)	✓(2nd)	✓(3rd)

Table 1 shows the functionality of the prototype, where the ultrasonic sensors were assessed if it would detect an obstacle (front, left, right) within the specified distance and if the buzzer will trigger if an obstacle was detected. Results revealed that the ultrasonic could only detect an obstacle for fewer than 0.7 meters. Likewise, the buzzer would only be triggered if an obstacle was detected. The buzzers would trigger in a succeeding manner if there were multiple obstacles detected. And as the distance of the prototype from an obstacle decrease, the frequency of tone produced by the buzzers increases.

Table 2. Functionality Test of the Water Sensor

	Surface	Detected	Beeped
DRY	✓	✓	×
WET	✓	✓	✓

As shown in table 2, the water sensor could detect an obstacle regardless of how dry or wet the surface was. However, the buzzer would only be triggered if the surface was wet. This implied that the buzzer would be triggered if there was a puddle of water on the surface, which then notifies the visually impaired person that the surface is wet. Results also revealed that as the distance of the prototype from a puddle of water decreases, the frequency of tone produced by the buzzer increases.

Table 3. Loudness and Range Test of the Wireless Buzzer

Is the button pressed?	Distance	Loudness (dB)
Yes	0m	79dBA
Yes	1m	74dBA
Yes	2m	70dBA
Yes	3m	66dBA
Yes	4m	64dBA

Table 3 above presents the loudness and range test results of the wireless buzzer. Results revealed that as the distance of the wireless buzzer from the prototype decreases, the loudness of tone produced by the buzzer increases.

The second objective of the study was to test the quality of the Ultrasonic Blind Stick in terms of stability, functionality, reliability, cost-effectiveness, and sensory. The prototype was evaluated by experts in the field of electronics engineering or any other related fields, engineering students, and visually impaired persons from the Home for the Blind Community based on the research instrument developed by the researchers.

Table 4. Evaluation Results from Professionals

Quality Dimensions	Mean	Verbal Interpretation
Stability	4.58	Excellent
Functionality	4.50	Excellent
Reliability	4.46	Excellent
Cost-Effectiveness	4.42	Excellent
Sensory	4.44	Excellent

Legend:			
	4.21 – 5.00	Excellent	(E)
	3.41 – 4.20	Very Satisfactory	(VG)
	2.61 – 3.40	Satisfactory	(G)
	1.81 – 2.60	Poor	(P)
	1.00 – 1.80	Very Poor	(VP)

Table 4 presents the evaluation results of the prototype from professionals. Results revealed that among the quality dimensions evaluated, stability was the strongest attribute of the prototype (M = 4.58), whereas its weakest attribute was cost-effectiveness (M = 4.42).

Table 5. Evaluation Results from Engineering Students

Quality Dimensions	Mean	Verbal Interpretation
Stability	4.29	Excellent
Functionality	4.31	Excellent
Reliability	4.37	Excellent
Cost-Effectiveness	3.88	Very Satisfactory
Sensory	4.55	Excellent

Legend:			
	4.21 – 5.00	Excellent	(E)
	3.41 – 4.20	Very Satisfactory	(VG)
	2.61 – 3.40	Satisfactory	(G)
	1.81 – 2.60	Poor	(P)
	1.00 – 1.80	Very Poor	(VP)

Table 5 presents the evaluation results of the prototype from engineering students. Results revealed that among the quality dimensions evaluated, only cost-effectiveness registered an interpretation of "Very Satisfactory" (M = 3.88). It was also revealed that sensory was the strongest attribute of the prototype (M = 4.55).

Table 6. Evaluation Results from Visually Impaired Persons

Quality Dimensions	Mean	Verbal Interpretation
Stability	4.16	Very Satisfactory
Functionality	4.60	Excellent
Reliability	4.48	Excellent
Cost-Effectiveness	4.12	Very Satisfactory
Sensory	4.48	Excellent

Legend:			
	4.21 – 5.00	Excellent	(E)
	3.41 – 4.20	Very Satisfactory	(VG)
	2.61 – 3.40	Satisfactory	(G)
	1.81 – 2.60	Poor	(P)
	1.00 – 1.80	Very Poor	(VP)

As shown in table 6, stability and cost-effectiveness registered an interpretation of "Very Satisfactory" (M = 4.16, M = 4.12). Results also revealed that functionality was the strongest attribute (M = 4.60), whereas its weakest attribute was cost-effectiveness (M = 4.12).

The third objective of the study was to develop the corresponding user's manual of the prototype. It was found out that the user's manual was user-friendly and easy to operate.

Conclusion and Recommendations

Based on the findings of the study, the following conclusions were drawn.

1. The Ultrasonic Blind Stick was functional and operational, considering the technical features mentioned in the study.
2. The prototype encompassed all quality dimensions mentioned in the study.
3. The user's manual was user-friendly and easy to operate.

In view of the findings and conclusion of the study, the following recommendations were formulated.

Future researchers should conduct related studies on the unexplored and underexplored aspects of this study. Suggestions to future researchers for the present technical features include the utilization of long-distance and high sensitivity proximity sensors, incorporation of headphones so that the sound produced by the buzzers could still be heard in crowded places, incorporation of vibration sensors to effectively alarm the visually impaired if an obstacle is nearby.

Future researchers were also encouraged to include additional technical features like lightweight, retractable cane so that the prototype could effectively be utilized in uneven surfaces, incorporation of a fall-detection sensor so that family members of visually impaired persons would be alerted if they have been in an accident. Moreover, future researchers should concentrate on cost-effectiveness when they develop improvements in the study.

Acknowledgement

To the following persons whose valuable contributions made this academic endeavor a success, my sincere and profound gratitude.

Dr. Norberto P. Mangulabnan, Dr. Andrew Eusebio S. Tan, Dr. Leah L. Fernandez, Dr. Joe Marie D. Dormido, Dr. Erlyn Mae G. Desamparado, Dr. Enna S. Bodoso, for their assistance and invaluable support.

Dr. Renato B. Salmingo, Dr. Dioscoro P. Marañon Jr., Dr. Vicente Y. Buenconsejo, for critiquing our manuscript.

Mrs. Pacita Tero, Mr. Elmer Dela Cruz, for allowing us to the conduct our study in the Home of the Blind Community.

The professional experts, engineering students, and the members of the Home of the Blind Community, for diligently and objectively evaluating the prototype.

Our family, friends, and relatives, for the unconditional love and undying support and encouragement.

And God Almighty, the author of knowledge and wisdom, for the gift of life and gift of understanding.

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Early Prediction of Diabetes using ID3 Algorithm

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Abstract - Diabetes is a very chronic disease that we should treat in an early stage. Predicting diabetes in an early stage can help us treat it well and improved treatment. Nowadays, a lot of research in diabetes done through data mining to help us predict and analyse through the help of each attribute and datasets. In this paper, the researcher manages to use the attributes and datasets as the training data and use ID3 algorithm to predict the result. The finding shows a strong relationship with other attribute used in this research. With regards to result, ages 31-40 and 41-50 most likely to have a diabetes. Another result says that delayed healing and sudden weight loss can be also a sign of a diabetic person. With this research, we can assist in decision making to our medical professionals in predicting the early signs of diabetes and can treat it in an early stage.

Keywords - Data Mining; Diabetes; ID3 Algorithm

Introduction

Nowadays, there are increasing number of diabetes cases around the world. This type of diseases can affect your life, your lifestyle, and the way you manage your daily routine. A lot of people suffer from this chronic disease and there are increasing number of deaths in this case. With this kind of disease, there is a chance of suffering from blindness and delayed healing. A lot of funds also spent by individual and our government to fight this kind disease (Paterson and Mercer 2018) (Skyler et al. 2017). There is an increased amount of diabetes as statistics shown in the year 2013 that revealed around 382 million individuals had this ailment around the world (Tao, Shi, and Zhao 2015). It was the fifth leading cause of death in women and eight leading causes of death for both sexes in 2015. Higher income countries have a high probability of diabetes (Organization 2019). There are approximately 451 million adults in 2017 that were treated with diabetes worldwide. There will be a projected of 693 million patients with diabetes will be exist around the world in 2045, and there will be a half number of populations will be undiagnosed. In 2017, the government spent an approximately 850 million USD with diabetes patient (Cho et al. 2018). We have very limited research in biological data but as time goes by their will be a computation and statistical models to be used for analysis. Several healthcare organizations gathered data from their patients to be use in this study. There is a continuous development of new knowledge gathered from a data using data mining techniques. Data mining were used to extract knowledge from the data, and this could be used for decision making process that will help medical assistance (Diwani et al. 2013). Several data mining techniques were used to predict and analyse this disease and finding knowledge with biomedical data (Alam 2019) (Alam and Awan 2018).

There is a lot of challenge in diagnosing a diabetes, because some attributes need to be considered before analysing and predicting the result (Cobos 2018). The following attributes were considered by the author: (1) Age; (2) Gender; (3) Sudden Weight Loss; (4) Genital Thrush; (5) Visual Blurring; (6) Delayed Healing; (7) Alopecia; and (8) Obesity. These attributes may help in analysing and predicting early sign of diabetes (Dorcely et al. 2017). In this study, early prediction of diabetes can be done using different attributes and decision tree prediction data mining Iterative like Dichotomiser (ID3) algorithm.

Methodology

Dataset

The dataset used in this study, is taken from Kaggle were sample of datasets are available (Kaggle 2021). Using this dataset, we can predict a patient whether it has a diabetes or not, the researcher gathered a list of 520 records that will be use in this prediction. The list of attributes to be use are: (1) Age; (2) Gender;

(3) Sudden Weight Loss; (4) Genital Thrush; (5) Visual Blurring; (6) Delayed Healing; (7) Alopecia; and (8) Obesity (9) Result. Table 1 shows the detailed attributes.

Attribute Explanation:

1. **Sudden Weight Loss** - unexplained weight loss can be a warning sign of diabetes (Pareek et al. 2018).
2. **Genital Thrush** - is a yeast infection (candida albicans) which tends to affect warm, moist areas of the body such as the vagina, penis, mouth and certain areas of skin (Morris 2021).
3. **Visual Blurring** - is a common sign of diabetes that isn't under control. When blood sugar levels are high for a long time, body water is pulled into the lens, causing it to swell (Lee, Chen, and Lai 2021).
4. **Delayed Healing** - wounds or sores that take more than a few weeks to heal might be infected and require medical treatment, and often indicate an underlying disease such as diabetes (Aikawa et al. 2017).
5. **Alopecia** - diabetes can interrupt process and slow down your hair growth. Having diabetes can also cause you to lose more hair than usual (Zhang and Nie 2021).
6. **Obesity** – obese people is more likely to have a diabetes (Ghada 2020).

Table 1. Attributes

Attribute	**Range**
Age	Age Bracket
Gender	Male/Female
Sudden Weight Loss	YES/NO
Genital Thrush	YES/NO
Visual Blurring	YES/NO
Delayed Healing	YES/NO
Alopecia	YES/NO
Obesity	YES/NO
Result	Positive/Negative

Diabetes Prediction System Architecture

Figure 1 shows the system architecture used for this study. It consists of three major phases such as (1) Data Pre-processing; (2) Apply ID3 Algorithm; and (3) Prediction.

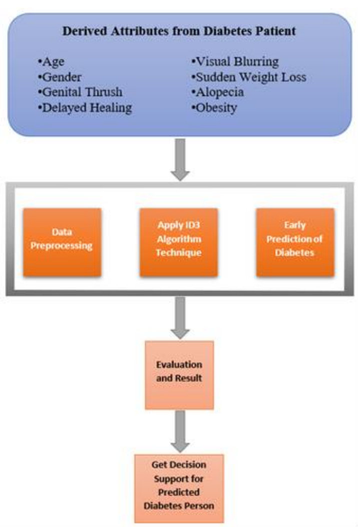

Figure 1. Diabetes Prediction System Architecture

I. Data Pre-processing

It is a process where the data needs to be check for the values and or noisy and inconsistent data. If the quality of the data is not that good, then there is no quality result to be found. For us to achieve a good quality of results, we need to pre-process the data before using it. There is a list of process that we might need to consider before applying the ID3 algorithm, there the following: (1) Data Cleaning; (2) Data Reduction; and (3) Data Transformation (Benhar, Idri, and Fernández-Alemán 2018).

1.1. Data Cleaning

In this stage, we might need to fill up the missing values and remove the data that we don’t need or the noisy data. Removing the noisy data can resolve a result of inconsistencies (Zainal Abidin, Ismail, and Emran 2018). In case of age, the researcher changes it to range so that we can predict a good quality of output.

1.2. Data Reduction

This process is used to reduce the number of attributes in a dataset that don’t correspond to changes in our prediction. Sometimes, smaller volume of dataset produces the same or almost the same result with bigger volume (Liu and Motoda 2015).

1.3. Data Transformation

Data transformation is consisting of smoothing, normalization, and aggregation of data (Malley, Ramazzotti, and Wu 2016). Binning method was also used for smoothness of data like age that can be classify into 6 categories as shown in Table 2.

Table 2. Binning of Age

Age (years)	Age Bins
21	20-30
31	31-40
41	41-50
51	51-60
61	61-70
71	>70

A sample dataset of 70 individual will be use as our training data for the prediction, as shown in Figure 2.

Age	Gender	sudden weight loss	Genital thrush	visual blurring	delayed healing	Alopecia	Obesity	class
31-40	Male	No	No	No	Yes	Yes	Yes	Negative
31-40	Male	No	Yes	No	Yes	No	No	Positive
31-40	Male	No	Yes	No	Yes	Yes	No	Positive
31-40	Male	Yes	Yes	No	No	Yes	No	Negative
31-40	Male	No	Yes	No	Yes	No	Yes	Positive
31-40	Male	No	Yes	No	No	Yes	No	Positive
31-40	Male	No	No	No	Yes	Yes	No	Negative
31-40	Male	Yes	No	No	No	Yes	No	Positive
20-30	Female	Yes	No	No	Yes	No	No	Positive
20-30	Female	No	No	No	Yes	No	No	Positive
20-30	Female	No	No	Yes	No	Yes	No	Negative
41-50	Female	No	No	No	Yes	No	No	Negative
41-50	Female	No	No	Yes	Yes	No	No	Positive
41-50	Female	Yes	No	No	No	No	Yes	Positive
20-30	Female	No	No	Yes	No	No	No	Positive
41-50	Female	No	No	Yes	No	No	No	Negative
41-50	Female	Yes	No	Yes	Yes	No	No	Positive

20-30	Female	Yes	No	No	Yes	No	No	Positive
41-50	Female	Yes	Yes	No	Yes	Yes	Yes	Negative
>70	Male	Yes	Yes	Yes	Yes	No	No	Positive
>70	Female	Yes	Yes	Yes	No	Yes	No	Positive
>70	Male	Yes	No	No	Yes	Yes	No	Negative
41-50	Male	Yes	No	No	Yes	No	No	Positive
20-30	Male	No	Yes	Yes	Yes	Yes	No	Positive
51-60	Male	Yes	Yes	Yes	No	Yes	Yes	Positive
>70	Male	Yes	Yes	No	No	No	No	Negative
51-60	Female	Yes	Yes	Yes	Yes	No	No	Positive
41-50	Female	Yes	No	Yes	Yes	No	No	Positive
20-30	Female	Yes	No	No	No	No	No	Positive
31-40	Male	No	No	No	No	No	No	Negative
20-30	Male	No	No	No	No	No	No	Negative
61-70	Male	No	No	Yes	Yes	Yes	Yes	Positive
51-60	Male	No	No	No	No	No	No	Negative
51-60	Male	No	No	No	Yes	Yes	Yes	Negative
51-60	Male	Yes	Yes	No	Yes	Yes	No	Positive
41-50	Male	Yes	Yes	No	Yes	Yes	No	Negative
31-40	Male	No	Yes	No	No	No	No	Negative
31-40	Male	No	No	No	No	No	No	Positive
41-50	Male	No	No	No	No	No	No	Negative

Figure 2. Training Dataset

In figure 3, it shows a test dataset that will be use later for prediction.

Age	Gender	sudden weight loss	Genital thrush	visual blurring	delayed healing	Alopecia	Obesity	class
41-50	Male	Yes	No	No	Yes	Yes	Yes	
31-40	Male	No	No	No	Yes	No	No	
>70	Male	No	Yes	No	Yes	Yes	No	
51-60	Female	Yes	Yes	No	No	Yes	No	
41-50	Female	No	No	Yes	Yes	No	Yes	
31-40	Male	No	Yes	No	No	Yes	No	
31-40	Male	No	No	No	Yes	Yes	No	
31-40	Male	Yes	No	No	Yes	No	Yes	
41-50	Female	Yes	No	No	Yes	No	No	
20-30	Female	No	No	No	Yes	No	No	

Figure 3. Test Dataset

II. Apply ID3 Algorithm

How does ID3 decide which attribute is the best? ID3 uses entropy and information gain to construct a decision tree (Mehrotra, Saxena, and Doohan 2018).

Information Gain

The information gain is based on the decrease in entropy after a dataset is split on an attribute. Constructing a decision tree is all about finding attribute that returns the highest information gain. It tells us how important a given attribute of a set is. We will use this to decide of attributes in the nodes of a decision tree. To define Gain, we first borrow an idea from Information Theory – Entropy (Mehrotra et al. 2018).

Entropy

A decision tree is built top-down from a root node and involves partitioning the data into subsets that contain instances with similar values (homogenous). ID3 algorithm uses entropy to calculate the homogeneity of a sample. If the sample is completely homogeneous the entropy is zero and if the sample is an equally divided it has entropy of one (Mehrotra et al. 2018).

Dataset

It is divided into training sets (used to build the model), and test sets (used to validate) (Rohman et al. 2019).

A Step-by-Step Process in Computing the Entropy and Information Gain.

Formula:

Uses Shannon Entropy (Kaewrod and Jearanaitanakij 2017)
Entropy(S) = − P(p) log2(P(p)) − P(n) log2(P(n))
P(p) = proportion of positive training examples in S
P(n) = proportion of negative training examples in S

Step 1: Compute for the Entropy of the entire data set.
Step 2: Compute for the Entropy and Gain for each attribute in the set.
Step 3: Select the attribute with the most Information Gain and use it as the root of the tree.

Rules: (Kaewrod and Jearanaitanakij 2017)
1. A branch with entropy of 0 is a leaf node.
2. A branch with entropy more than 0 needs further splitting.
3. Construct the Decision Tree and repeat until all nodes are pure (Zero Entropy).
4. The ID3 algorithm is run recursively on the non-leaf branches, until all data is classified.

III. Prediction

We are now going to evaluate all the attributes after it is computed based on ID3 algorithm. It will also display the predicted output for the historical data.

In figure 4, these are the files that are stored on our java folder where the program is stored. As you can see the files DiabetesDatasetTest.csv and DiabetesDatasetTrain.csv are what we are needing for the next process.

Name	Date modified	Type	Size
.classpath	20/11/2021 12:27 PM	CLASSPATH File	1 KB
.project	20/11/2021 12:27 PM	PROJECT File	1 KB
DiabetesDatasetTest.csv	20/11/2021 6:25 PM	Microsoft Excel C...	1 KB
DiabetesDatasetTrain.csv	20/11/2021 5:49 PM	Microsoft Excel C...	3 KB
ID3$TreeNode.class	20/11/2021 12:37 PM	CLASS File	2 KB
ID3.class	20/11/2021 12:37 PM	CLASS File	8 KB
ID3.java	20/11/2021 12:37 PM	JAVA File	14 KB

Figure 4. Java Folder

Using java program, we can predict the result based on the training data and test data both have a CSV file. Just type the following syntax in command prompt for us to create another csv file for the predicted result as shown in figure 5.

```
java ID3 DiabetesDatasetTrain.csv DiabetesDatasetTest.csv > PredictionResult.csv
```

Figure 5. Command Prompt Syntax

After typing the syntax, another file will be created as our predicted output for the filename PredictionResult.csv as shown in figure 6.

Name	Date modified	Type	Size
.classpath	20/11/2021 12:27 PM	CLASSPATH File	1 KB
.project	20/11/2021 12:27 PM	PROJECT File	1 KB
DiabetesDatasetTest.csv	20/11/2021 6:25 PM	Microsoft Excel C...	1 KB
DiabetesDatasetTrain.csv	20/11/2021 5:49 PM	Microsoft Excel C...	3 KB
ID3$TreeNode.class	20/11/2021 12:37 PM	CLASS File	2 KB
ID3.class	20/11/2021 12:37 PM	CLASS File	8 KB
ID3.java	20/11/2021 12:37 PM	JAVA File	14 KB
PredictionResult.csv	20/11/2021 6:12 PM	Microsoft Excel C...	4 KB

Figure 6. Added File PredictionResult.csv

Figure 7 shows the compressed ID3 result applied to our program and the prediction result based on the test dataset that we have applied to our program. Based on the result, there are 6 positive to a diabetes and 4 negative.

sudden weight loss=No
ï»¿Age=31-40
Genital thrush=No
Alopecia=Yes
Class: Negative
Alopecia=No
Obesity=Yes
Class: Negative
Obesity=No
delayed healing=Yes
Class: Negative
delayed healing=No
visual blurring=No
Gender=Male
Class: Negative
Gender=Female
Class: Negative
visual blurring=Yes
Class: Negative
Genital thrush=Yes
delayed healing=Yes
Class: Positive
delayed healing=No
Alopecia=Yes
Class: Positive
Alopecia=No
Class: Negative
ï»¿Age=20-30
delayed healing=Yes
Genital thrush=No
Obesity=Yes
Class: Negative
Obesity=No
Alopecia=Yes
Class: Negative
Alopecia=No
visual blurring=No
Gender=Male
Class: Negative
Gender=Female

Genital thrush=No
Gender=Male
Class: Negative
Gender=Female
Class: Negative
Genital thrush=Yes
Class: Negative
Obesity=No
Class: Positive
ï»¿Age=>70
Class: Negative
ï»¿Age=51-60
Class: Positive
ï»¿Age=61-70
Class: Negative
visual blurring=Yes
Class: Positive
Positive
Negative
Negative
Positive
Positive
Positive
Negative
Positive
Positive
Negative

Figure 7. Prediction Result

Results and Discussions

In figure 8, using the historical data (training data) and test data, the researcher came up with the following prediction result: (1) Patient 1, 4, 5, 6, 8, and 9 will be most likely to have a diabetes based on the predicted result; (2) Ages 31-40 and 41-50 may have a diabetes; and (3) We can also consider that delayed healing and sudden weight loss can be a sign for person that has a diabetes.

Test Data

Age	Gender	sudden weight loss	Genital thrush	visual blurring	delayed healing	Alopecia	Obesity	class
41-50	Male	Yes	No	No	Yes	Yes	Yes	
31-40	Male	No	No	No	Yes	No	No	
>70	Male	No	Yes	No	Yes	Yes	No	
51-60	Female	Yes	Yes	No	No	Yes	No	
41-50	Female	No	No	Yes	Yes	No	Yes	
31-40	Male	No	Yes	No	No	Yes	No	
31-40	Male	No	No	No	Yes	Yes	No	
31-40	Male	Yes	No	No	Yes	No	Yes	
41-50	Female	Yes	No	No	Yes	No	No	
20-30	Female	No	No	No	Yes	No	No	

Prediction Result

Prediction Result
Positive
Negative
Negative
Positive
Positive
Positive
Negative
Positive
Positive
Negative

Figure 8. Test Data and Prediction Result

Conclusion and Recommendations

The researcher provided very good research in combining data mining technique in predicting early sign of diabetes. ID3 algorithm was used to analyze and predict the result using the given attributes and several records that had been used as a training data. The medical professional can also benefit with this research to help them in their decision making. With regards to result, ages 31-40 and 41-50 most likely to have a diabetes. Another result says that delayed healing and sudden weight loss can be also a sign of a diabetic person.

Due to lack of time, the researcher would like to recommend that this study would have a good application for easy data analysis and prediction.

Acknowledgement

The researcher would like to thank the Quezon City University particularly the College of Computer Science and Information Technology for giving us an opportunity, guidance, and pushing us to create a research paper that we are now submitting in this conference. Truly a great pleasure for having us in this very beautiful conference. Thank you very much.

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File Encryption and Decryption using Blowfish Algorithm in Securing School Records

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Abstract - Uploading and storing files via cloud storage can be a good strategy especially if you are using this with your important files. Sharing cloud storage with different person can ease the problem in providing all the needed files to everyone. But this can bring some problem in concern to the privacy of each file being shared with others. So, this paper addresses the current problem through a file encryption/decryption using blowfish algorithm to secure the file before this can be uploaded on the cloud storage that was shared with others. Using the application, the file is being encrypted with password security before it can be uploaded on the cloud storage. From the cloud storage, the file needs to download and using the application to decrypt the file using the same password and the file is now readable.

Keywords - Blowfish Algorithm, Cryptography, Cloud Storage

Introduction

Data can be a precious and useful to groups and people. This can be also use in different ways like in work, school requirements, projects, assignments, research, thesis, etc. (Malathi et al., 2019). Different companies offered cloud storage like Google Drive and One Drive that been using by many people, governments, private companies, etc. (Yuhuan, 2017) Uploading and storing files via cloud storage can be a good strategy especially if you are using this with your important files (Khatod et al., 2020). Sharing cloud storage with different person can ease the problem in providing all the needed files to everyone (Machida et al., 2020). But this can bring some problem in concern to the privacy of each file being shared with others. So, the researcher proposed a file encryption/decryption using blowfish algorithm to secure the file before this can be uploaded on the cloud storage that was shared with others.
Cryptography is the process of hiding information and can achieve security by encoding messages so that this can't be read (Hazhirpasand & Ghafari, 2021). Using cryptography, it can prevent modification and unauthorized access of the file during the transmission and address data privacy preservation (Abdulla & Rana, 2021) (Radhika et al., 2021). Some popular symmetric-key block ciphers currently available this includes DES, 3DES, CAST5, RC6, CAST5, Twofish, Serpent, AES, and IDEA (Elgeldawi et al., 2019).

Blowfish algorithm was designed by Bruce Schneier in 1994; this aims to replace the outdated DES and it is a symmetric block cipher. Blowfish is a 64-bit variable length symmetric block cipher (Schneier, 1994). Blowfish is one of the fastest, compact, easy to understand, easy to implement, free alternative to existing encryption algorithms and features variable security level except when changing keys (Quilala et al., 2018). Blowfish algorithm consists of two parts-key expansion and data encryption. In the key expansion, applying XOR to the variable length key and plaintext are used to produce the subkeys and generate the four key-dependent s-boxes. Each round requires around four kB which made the algorithm inapplicable for devices with a small memory like a smart card and phone. Using the algorithm, computation of the subkeys every time results in slower operation which made the algorithm inefficient to use in an application that requires changing secret key frequently (Hashim et al., 2021).

Methodology

This will discuss the whole process of the proposed research.

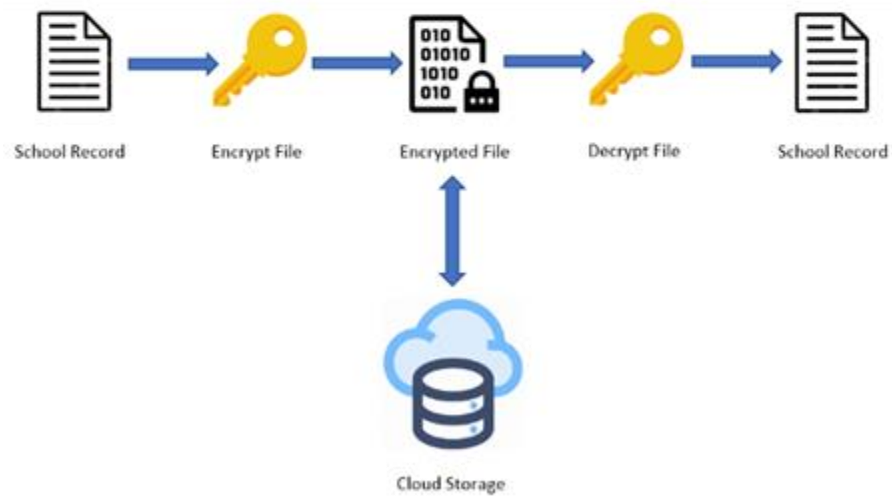

Figure 1. System Architecture

In figure 1, the file will be encrypted using blowfish algorithm with password security and the file will be uploaded on the cloud storage. In decrypting, choose the encrypted file in the cloud storage and enter the correct password and the file will now be decrypted and readable.

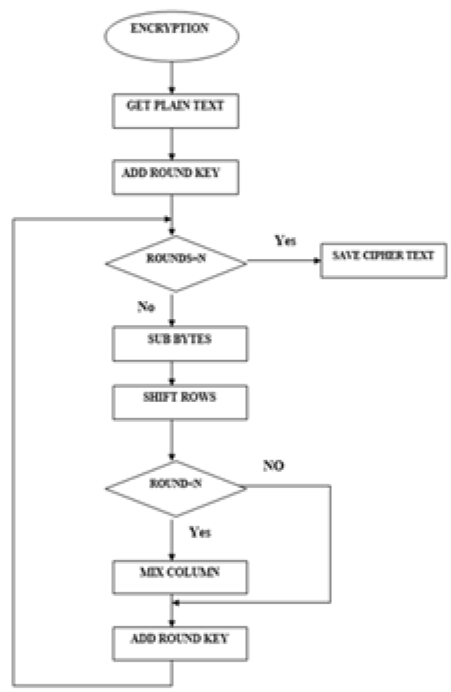

Figure 2. Encryption Process Flowchart

In figure 2, the user will get the plain text and then add a round key. If the Rounds=N is yes it will save a cipher text, and if the Rounds=N is no it process a sub bytes and shift rows. A Round<N is yes it will mix the column and if no both are going to add round key and proceed again to Rounds=N.

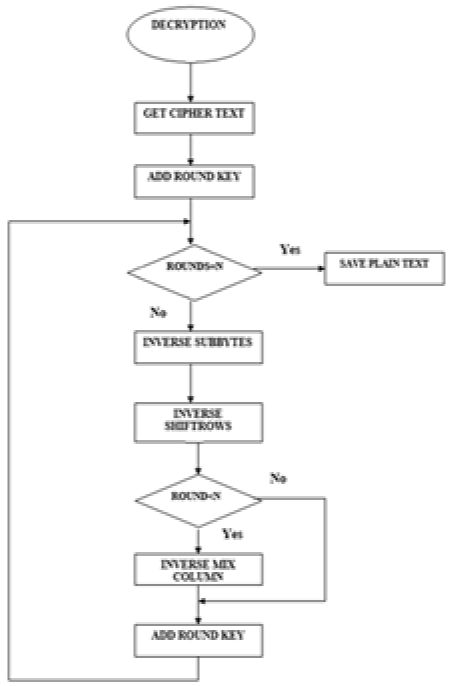

Figure 3. Decryption Process Flowchart

In figure 3, the user will get the cipher text and it will add round key. If Round is no, it will inverse the sub bytes and inverse shift rows, otherwise it will save plain text. If Round is yes, it will inverse mix column and if no it will proceed to add round key.

Step by step process of Blowfish Algorithm

(Al-Kateeb & Mohammed, 2020)(Aldarwbi & Al-Kharobi, 2017)(de Los Reyes et al., 2019)(Gamido, 2020)(Hameed & Ali, 2019)(Kim & Kim, 2019)(Li & Liu, 2020)(Xu et al., 2020)

1 Initiate the substitution box (Sbox) and permutation box (Pbox). The Pbox entries are shown as the Pi in the diagram above. There are a total of 18 Pbox entries.
2 Next, we split our 64-bit plaintext into two equal blocks, L and R.
3 Next, we enter an encryption loop that runs 16 times. The following steps take place in each loop:
   a. We XOR L with Pi, where i depends on the loop's current iteration.
   b. We then XOR R with F, which is a function of L that makes use of the Sbox split into 4 blocks. The overview of the F function is shown in the image below.
   c. Finally, L and R are swapped before the loop enters its next iteration.
4 After the loop finishes, L and R are swapped once more.
5 Next, we make use of our last two unused Pbox entries by XORing R with P17 and L with P18.
6 Finally, we combine L and R to retrieve the ciphertext.

Results and Discussions

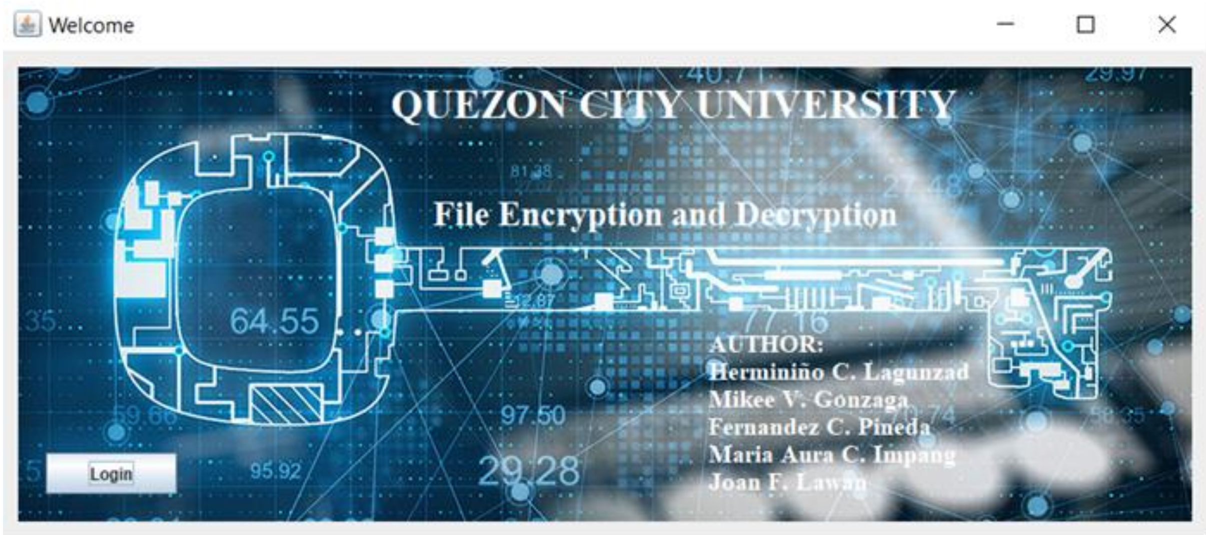

Figure 4. Welcome Page

This shows the main page of the application as shown in figure 4.

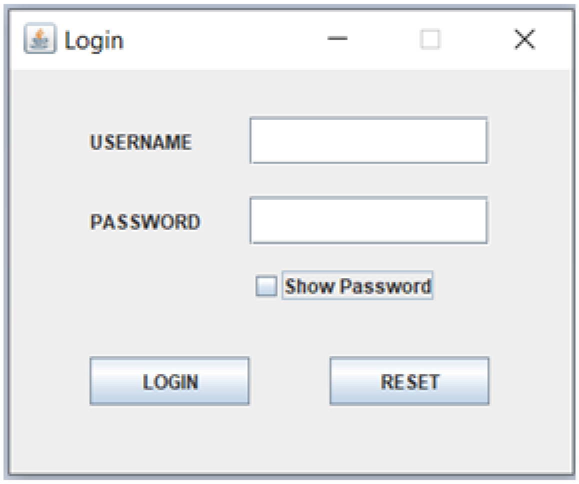

Figure 5. Login Page

In figure 5, the user may need to enter the correct username and password to use the application.

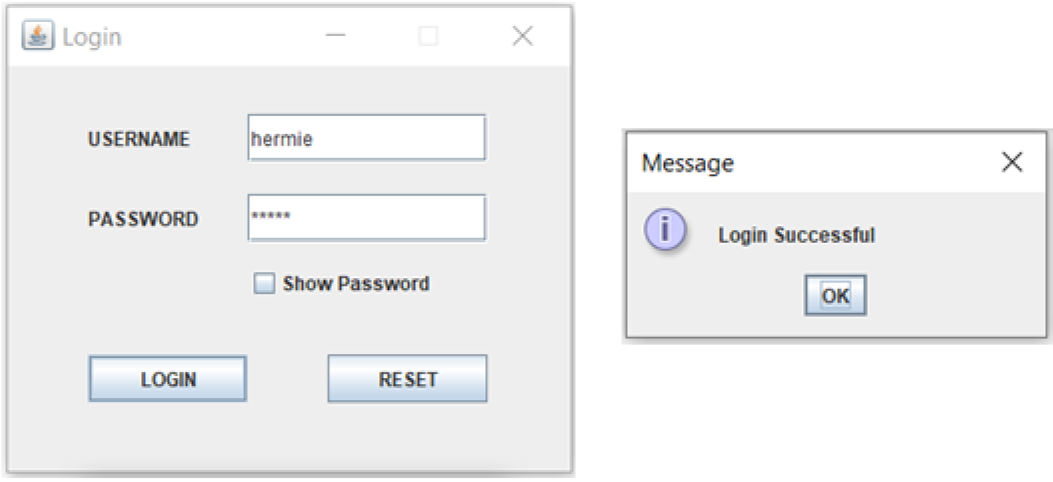

Figure 6. Login Successful

If the user entered the correct username and password, he/she can now use the application as shown in figure 6.

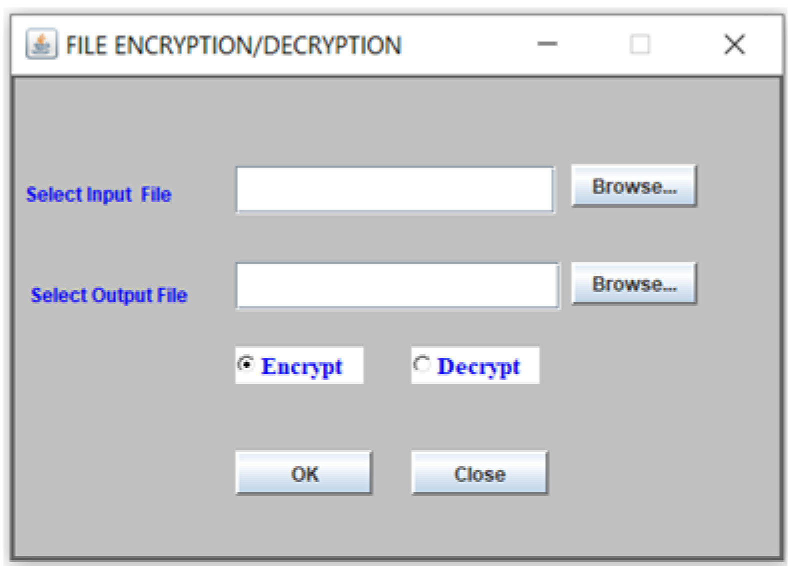

Figure 7. File Encryption/Decryption

In figure 7, the user can now encrypt and decrypt file.

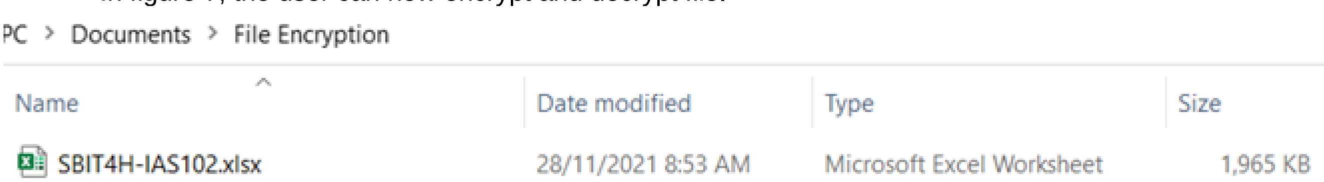

Figure 8. Original File

Figure 8 shows the original file that will be use for our encryption process.

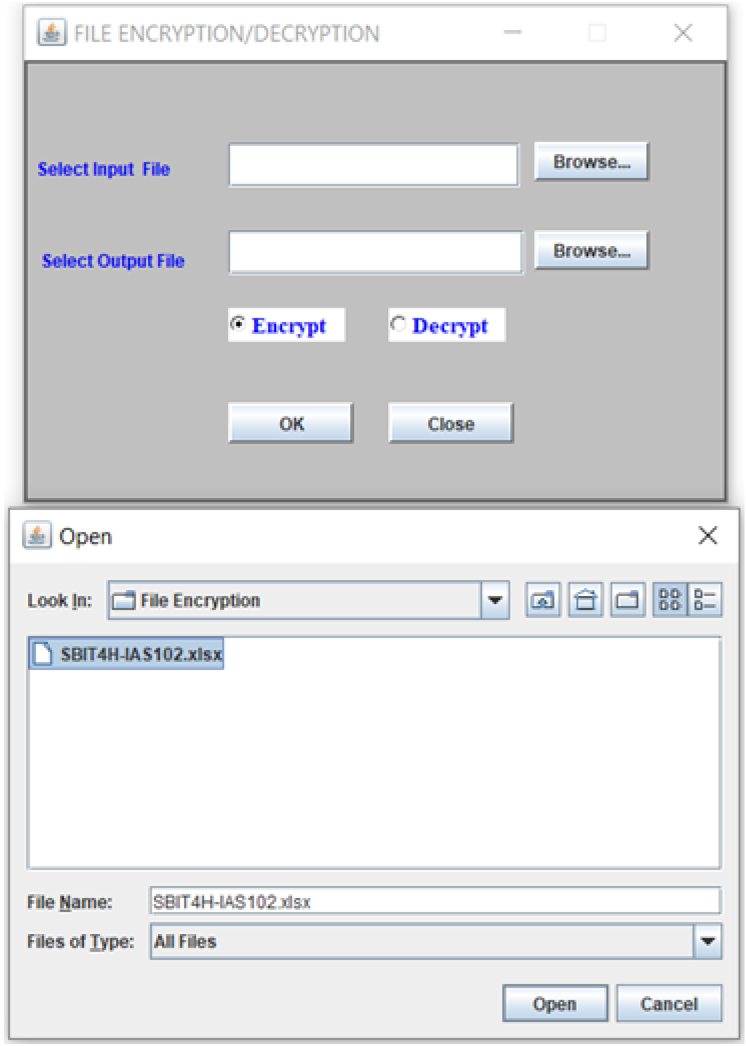

Figure 9. Select File for Encryption

Figure 9 shows the file selection process where you can select the file you want to encrypt.

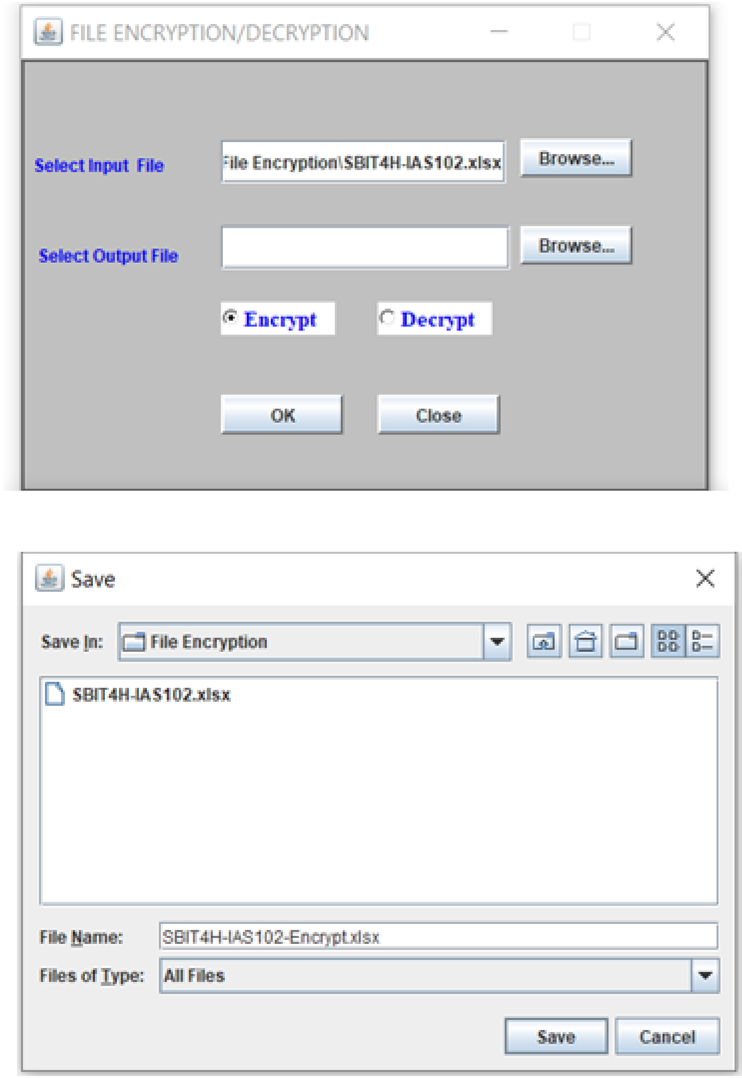

Figure 10. Select File for Encryption Output

In select input and output file, you need to select either the same file or different file for your input and output file. In selecting two different files for this process, will prevent the original file for corruption. After selecting the file, you need to check the Encrypt combo box then click OK as shown in figure 10.

Figure 11. Encrypt Password

Another form will appear requesting the password you may want to apply as show in figure 11.

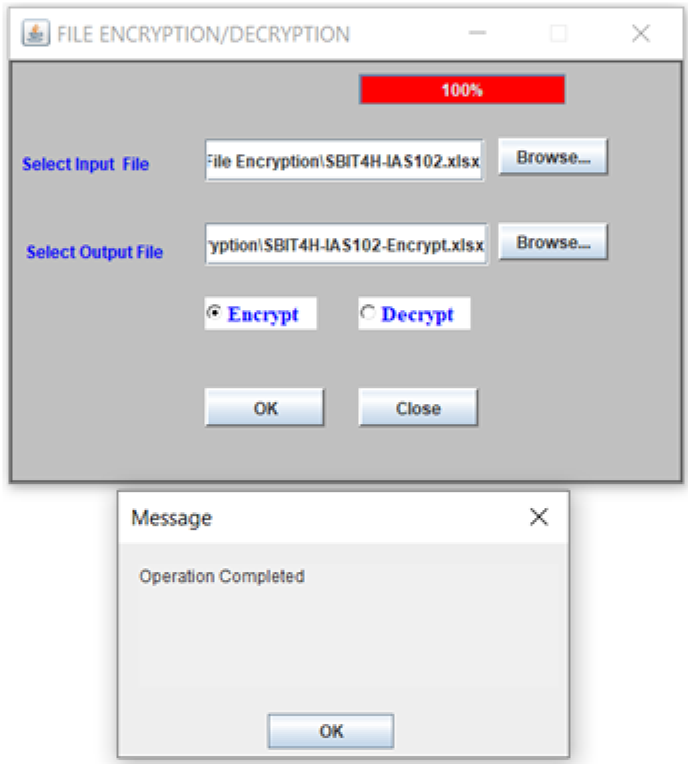

Figure 12. File Encryption Successful

After entering the password, a message box will appear "Operation Completed". This means that the file has been encrypted and ready for sharing as shown in figure 12.

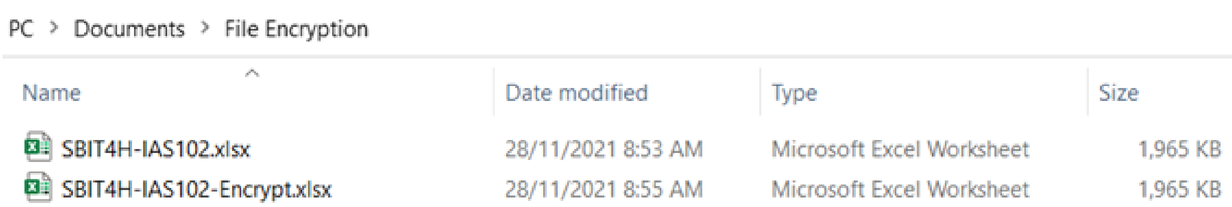

Figure 13. Encrypted File Created

After the encryption process successful, a new file will be created for the encrypted file as shown in figure 13.

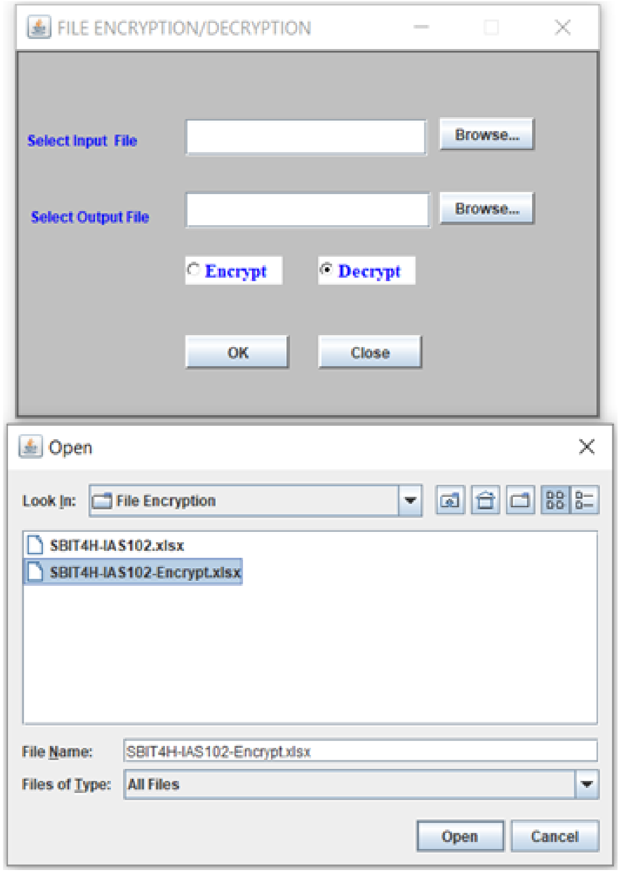

Figure 14. Select File for Decryption

In figure 14, the user may need to select the encrypted file for this process.

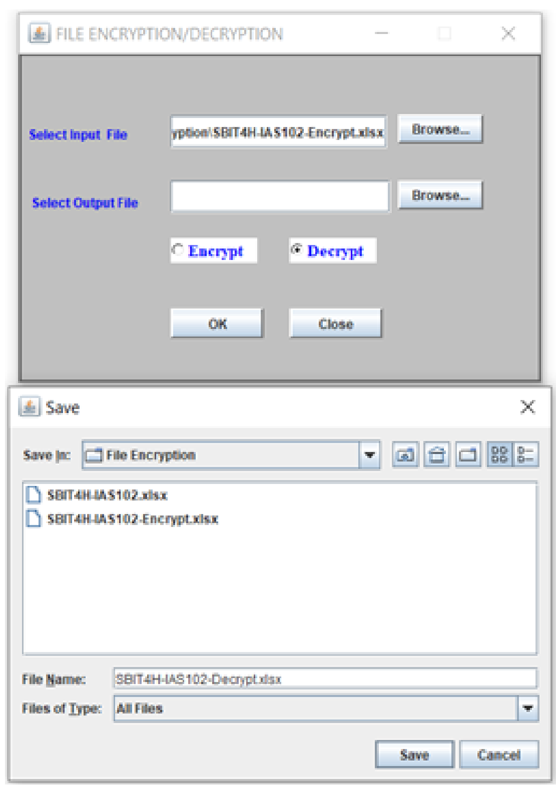

Figure 15. Select File for decryption Output

In figure 15, the user will select the file that needs to be decrypt and the user has the choice of selecting two different file or one file only for this process. Then the user needs to click the Decrypt combo box then click OK.

Figure 16. Decrypt Password

After clicking the OK button, the password form will appear, and you need to enter the same password that entered during encryption process as shown in figure16.

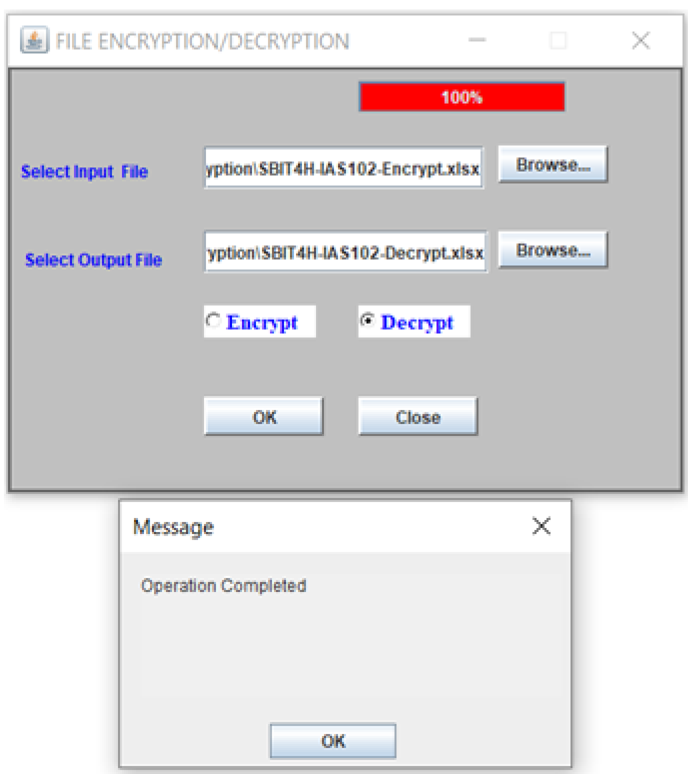

Figure 17. Decryption Successful

In figure 17, shows the decryption process is completed after entering the right password. The file is now available for viewing.

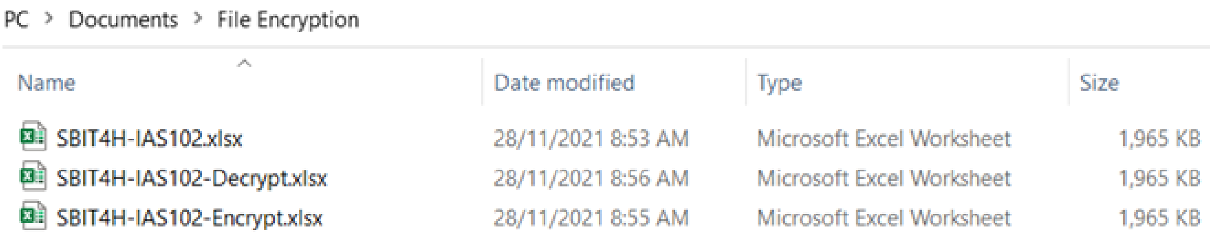

Figure 18. Decrypted File Created

In figure 18, after a successful decryption process, a file will be created and is now readable.

Acknowledgement

The researcher would like to thank the Quezon City University particularly the College of Computer Science and Information Technology for giving us an opportunity, guidance, and pushing us to create a research paper that we are now submitting in this conference. Truly a great pleasure for having us in this very beautiful conference. Thank you very much.

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Quality and Safety Assessment of a Developed Solar Thermal Processing System for Cashew (Anarcardium occidentale) Kernels Processing

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Abstract - In many instances, when designing and building an equipment for food applications, there exists a gap between efficiency and food safety. Machines are efficient but the safety of the food that it processes were not considered. These machines are deemed inappropriate once introduced to potential users. The study aims to assess the quality and safety of a developed concentrated solar thermal processing (CSTP) system for cashew kernels roasting for local processors in Cagayan de Oro, Philippines. Microbiological and physico-chemical analyses were conducted and evaluated using the Philippine National Standards (PNS) as reference for specifications. Moisture, color, and microbial content are well within the standards of maximum 5%, white to brown, and negative to E. coli and Salmonella, respectively. Breakage during processing from measuring size per kilogram was also very minimal at below 5%. These results show that a localized, cheaper, and readily fabricated CSTP system can produce roasted cashew kernels within PNS and can be adopted for use for a more efficient and quality and safety compliant processing.

Keywords - Assessment; cashew; solar; thermal processing; quality and safety

Introduction

One of the challenges faced by rural farmers is the lack of access to processing equipment that could value add their produce especially when there is surplus of harvest. Low mechanization of crops in the Philippines has tremendous impacts on socioeconomic status, labour productivity and farm income, among others (PCARRD, 2009). There is available equipment in the market, but it is either too expensive or not fit for the farmer's produce. Local fabrication tailor fitting an equipment according to the groups of produce, i.e. grains, nuts, etc., is seen to be a solution to address the demands for farm modernization with consideration to servicing that will now be locally available. It has also been observed that quality and safety of processed products has been a major concern of consumers (FSN, 2020) as well as a basic human right (WHO, 2019). More and more humans are also interested in foods with bioactive compounds for the health benefits these foods provide. In the Philippines and globally, cashew kernels are considered a high value product due to its taste and bioactive compounds (Alasalvar, 2015).

As a major tourist food souvenir in the Philippines, cashew kernels among other nuts are always a product that is worthy of assistance especially in the process standardization. Roasting being on of the processes has still been done manually even up to today by majority of cashew kernel local processors. The efficiency of the manual roasting process is low. Availability of roasting machines is minimal or the price is beyond the capacity of local micro and small cashew enterprises in Cagayan de Oro City, Philippines. Electricity is also sometimes not available in farms and use of these electricity-based equipment is not practical. To address this, the fabrication laboratory of the USTP has developed a concentrated solar thermal processor that is capable of roasting nuts and other produce and electricity-independent.

Therefore, this study is aimed at assessing the quality and safety of cashew kernels roasted using a developed concentrated solar thermal processing system in terms of its physico-chemical and microbial properties.

Methodology

Procurement of cashew kernels. Good quality cashew kernels were procured direct from the farm at Lumbia, Cagayan de Oro, Philippines based on the specifications in the Philippine National Standards for Cashew (PNS/BAFPS 59:2008). The cashew kernels are pre-dried and peeled ready for roasting.

Roasting of cashew kernels. The plain cashew nuts were roasted in the roasting chamber of the concentrated solar thermal processor. It is roasted at 180°C for 30 minutes with the drum roaster mechanically spins to ensure equal roasting.

Proximate analysis. Calories, moisture, protein, fat, ash and carbohydrates of the samples were determined using the methods recommended by the OMA AOAC (2007).

Physico-chemical analyses. Color and percent breakage were analysed. Color was analysed through high resolution photography of cashew kernels from raw to fully roasted at a 10-minute interval and quantified using a Konica-Minolta CR 400 Chroma Meter. Percent breakage is calculated by measuring the total broken kernels and dividing it with the total weight of the kernels and multiplying it by 100.

Microbial analyses. Plain and roasted cashew kernels were subjected to aerobic plate count, yeast and mold count, Salmonella detection and E. coli enumeration. The methods of analyses were based on the Bacteriological Analytical Manual.

Results and Discussions

Proximate analyses. Table 1 shows the chemical composition of cashew kernels. More or less, the values can be compared to those provided by the Philippine Food Composition Table (PhilFCT, 2021) for roasted cashew kernels.

Table 1. Chemical composition (g/100g) of plain and roasted cashew kernels

Parameter (g/100g)	Plain cashew kernel	CSTP Roasted cashew kernel
Calories, kcal	**528.94**	**618.98**
Fat	**38.80**	**46.78**
Protein	**21.75**	**17.84**
Moisture content	**6.14**	**2.10**
Ash	**2.45**	**2.63**
Carbohydrate	**27.10**	**31.65**

Calories, in kcal, is seen to increase as a result of the loss of moisture and concentration of fat content with the kernels. These results coincide with studies such as that in potatoes (Ramasawmy,e t.al, 1999) and some tree nuts (Ghazzawi, 2017). Roasting has also resulted in the decrease of protein which can be explained by the denaturation of some amino acids at high temperatures. These are also observed in studies on roasting temperatures and protein in beef patties (Xia, et.al, 2021), flaxseed meal (Waszkowiak, 2020) and cashews (Yan, et.al., 2021).

Table 2. Average color profile of cashew kernels

Parameter	Plain cashew kernel	CSTP Roasted cashew kernel
Color output		
Time	0 minutes	35 minutes
L*a*b* values	72.47*2.57*20.25	61.55*8.45*27.14
% Breakage	-	3.79%

Roasting was stopped when the color changed from whitish brown to brown. Table 2 shows that at 35 minutes, the cashew kernels are already in a dark brown color which is no longer desirable. As such, it was determined that the roasting time, provided temperature of 180°C is reached will last for 30 minutes to produce safe and quality roasted cashews.

The L*a*b* values are also called the tri-stimulus model created by Richard Hunter in the 1940's. The L*a*b* stands for lightness, red/green value and blue/yellow value, respectively. The higher the L* color means that it is leaning toward the ligher portion of the chart (Xrite, 2021).

A percent breakage of 3.79% indicates that the spinning motion of the roaster can produce roasted cashew kernels that are of high efficiency in terms of minimal loss from breakage without the need for human labor. There are no breakage percentage for the plain cashew kernels at it was already set to only use good quality cashew kernels for the roasting process.

Table 3. Microbial analyses of plain and roasted cashew kernels

Parameter (g/100g)	Plain cashew kernel	CSTP Roasted cashew kernel
Aerobic plate count	1.31×10^5	1.20×10^5 CFU/g
Yeast and molds	77 CFU/g	17 CFU/g
E. coli	<3.0 MPN/g	<3.0 MPN/g
Salmonella	Not detected	Not detected

Microbial analyses result presented in Table 3 shows that roasting, although produces heat that can potentially destroy viable microorganisms, but it is not enough to kill a lot (Britton, et.al., 2021) due to the inherent amount present in the raw material. What is more important is to ensure that the moisture is within standard as low moisture has a positive effect towards the quality (Shirmohammadi, et.al., no date) and safety (Shakerardekani, et.al., 2019) of the product during storage.

E. coli and Salmonella are pathogenic microorganisms that may indicate faecal contamination in food. The absence of Salmonella and E. coli below the acceptable standard of 3 MPN/g (FDA, 2013) indicates that the roasted cashew kernels produced using the CSTP is safe for human consumption.

The reduction of yeast and molds from the plain cashew kernels to the roasted kernels are within expectation given that low resistance of many yeasts and molds species to dry heat (Scott and Bernard, 1985). A 106/g aerobic count and lower is indicative of acceptable microorganism's level for nuts (Irtwange and Oshode, 2009). The results may relate to the effectivity of pre-treatment of plain cashew kernels prior to roasting. Overall, the microbial results show that the use of CSTP as an economical roaster for nuts is viable.

Conclusion and Recommendations

The study has shown that farm mechanization can be fulfilled by local fabrication of an efficient and safe food producing machine in this case, a concentrated solar thermal processing (CSTP) system for roasting. With minimal changes in the microbial load before and after roasting, this suggests the importance of following Good Manufacturing Practices during the preprocessing treatments to produce plain cashew kernels. In general, based on physico-chemical, proximate analysis and microbial profile data, the CSTP is a suitable equipment to roast cashew nuts.

Acknowledgement

The authors would extend our thanks to the Department of Science and Technology Regional Office X for the financial support for the research, as well to the University of Science and Technology of Southern Philippines for the Administrative support in implementing the said research undertaking.

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Performance and Capabilities of Automated a Solar-Powered Floating-Type Aeration System for Aquaculture Ponds

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Abstract - Aeration improves water quality in the pond and make it more favorable to fish environment. The Automated Solar Powered Floating Type Aeration System (ASPFTAS) was designed based on environmental requirement and actual characteristics of fresh water fishpond. The system consists of platform, power system, controllers with sensor, signalling and aerator. Machine possessed the capability to monitor the real time condition of the water, record and saved the data in an SD card and transmit data to mobile phones. The oxygen transfer rate (OTR) of ASPFTAS recorded 0.07 kg of oxygen infused in the water in one (1) hour using the four diffusers. The standard aeration efficiency attained during the test was 0.2710 kg of oxygen/hp-hr. The standard oxygen transfer efficiency was 0.36 at 18 kg of oxygen mass transferred by aerator into the fishpond water. The results of aeration test rated highly effective; the dissolved oxygen level increased 1.32 ppm in 10 minutes test. The performance of ASPFTAS using 1, 2, 3 and 4 diffusers at different depths, distances and different time of aeration revealed significantly difference among treatments. The evaluation of process controller, sensors and signalling system conducted in a laboratory for one hour revealed highly sensitive.

Keywords - Aeration system, Dissolved Oxygen, Oxygen Transfer Rate, Solar-powered aerator, Automation

Introduction

Fisheries are one of the major industries in the agriculture sector. It is composed of three subsectors, namely: commercial fisheries, municipal fisheries, and aquaculture. Based on the recent national accounting estimates, fisheries sector contributes 19.6% of the total Gross Value Added (GVA) in agriculture and 1.8% of the total GDP. The Philippines is ranked 7th among the top fish producing countries in the world in 2012. However, since 2010 its economic contribution has been declining (PSA, 2014). Nowadays, aquaculture sectors are moving towards highly intensive farming to significantly increase the production and contest the growing demand as projected years to come, but the chances of risk increased due to management failures. In addition, the intensive production does not have enough facilities and equipment to maintain since the acquisition and installation costs are highly expensive in developing countries like the Philippines.

Modern aquaculture experience suggests that about 2,000 kg/ha of most species of shrimp and fish including tilapia can be produce in ponds without aeration. With proper aeration, it is reasonable to expect a production of up to 6,000 kg/ha. Tilapia are a species that can tolerate low dissolved oxygen (DO) with production in excess of 5,000 kg/ha in unaerated ponds (Oakes, et al., 2011). The use of an aeration system in pond increases the dissolved oxygen levels; it creates water movement, it enhances fish productivity, makes pond healthier and prevents unwanted vegetation growth. A diffused aeration system works by pushing the air from bottom to top of the pond water, releasing it into thousands of tiny bubbles that rise to the surface and disrupt the thermocline. This water movement provides a more uniform oxygen level and temperature throughout the entire body of water.

Research Objectives

The general objective of the study was to design and automate a solar-powered floating type aeration system to improve dissolved oxygen in the fishpond. Specifically, the study aimed to: (a) evaluate the aeration performance aeration system; (b) evaluate the automation capabilities of SPFTAS in improving the dissolved oxygen level; and, (c) evaluate the sensitivity response of automation system.

Methodology

Materials and Methods

Design of Automated SPFTAS

The ASPFTAS (Figure 1) was fabricated based on the design requirements of the aeration system, solar power system, buoyancy control system (floating platform), process control and sensor system, and signalling system.

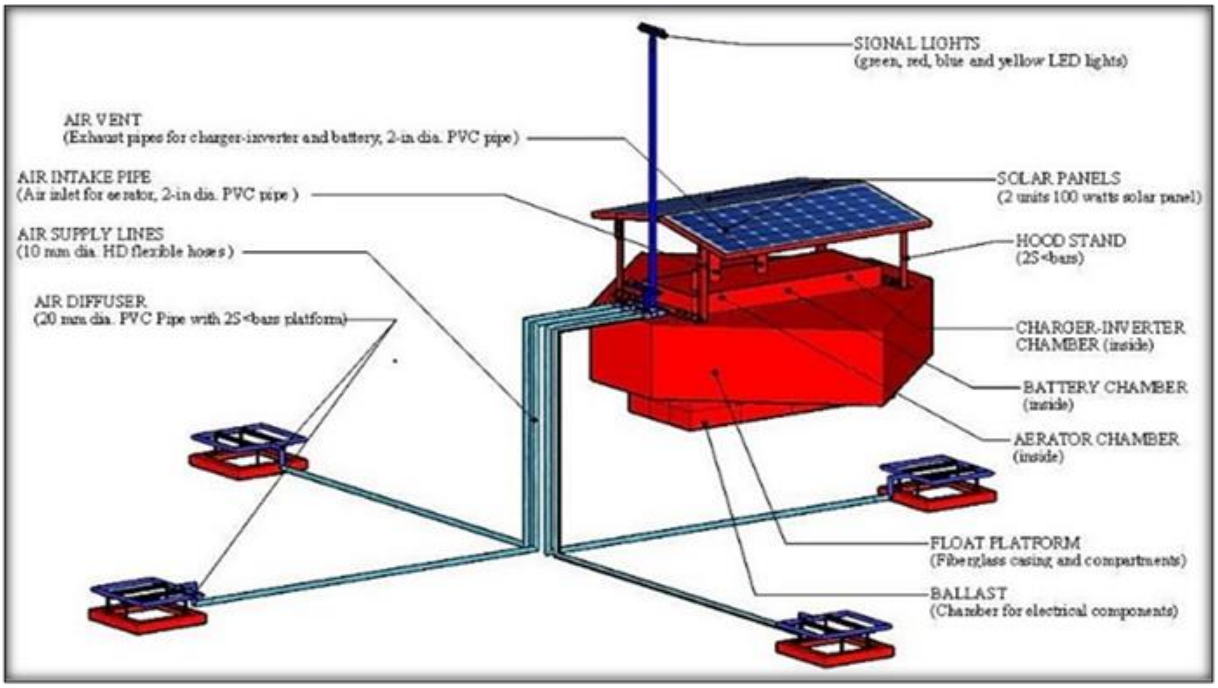

Figure 1. Design of ASPFTAS

Aeration System

The aeration system consists of 180 watts aerator to supply the volume of air to supply DO requirement. The aerator used a vortex type air pump with input rating of 220 volts alternating current and pressure output of 8.0 kPa. Operated with AC power and connected to relay switch coupled to a 220-volt outlet from power inverter.

The SPFTAS is equipped with four (4) diffusers made of 20.0 mm outside diameter perforated PVC pipes with a metal base platform made from a 20 mm x 20 mm x 5 mm angle bar. The diffusers are 10.0-mm diameter chemical hose feeder lines and are attached individually to a PVC valve (ball-type) valve.

Solar Power System

The system power requirement used 196 watts to operate the 180 watts aerator and its accessories in 1 hr. The total power requirement to operate 5 hrs per day was 980 watts. Since the ASPTAS can only deplete the battery charge level to 50%, the system required battery capacity was 1960 watts or a battery with bank size of 163 ampere-hour. The ASPFTAS used a 12 V- 200 Ah deep cycle lead-acid type storage battery. The system used 3,000 watts inverter-charger with an actual rating of 2,100 watts to transform direct current power into alternating current and has an output voltage of 220 volts and 6 ampere current

rating. Based on the power requirement the ASPFTAS needed to use 2 solar panels, each with 100 watts capacity to fully charge the battery in 6 hours.
The installation and deployment of SPFTAS depended on the size and shape of the pond. The pond that was used in

Installation of SPFTAS and Pond Layout

the test and evaluation had a dimension of 44 m x 44 m. The minimum water depth was 0.8 m. The pond layout and positioning of the SPFTAS in the performance evaluation are illustrated in Figures 2 and 3.

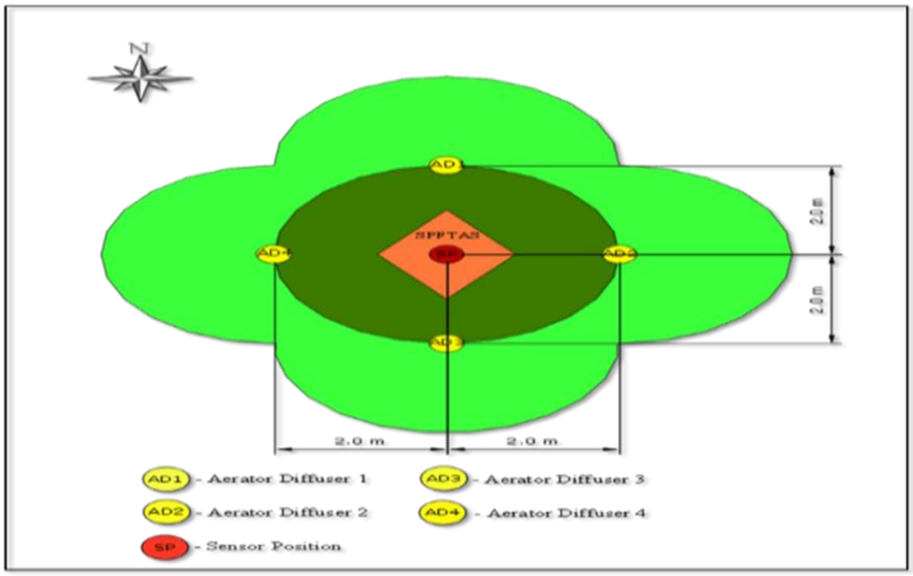

Figure 2. Diffuser layout and set-up of SPFTAS for the evaluation of aerator performance, sensitivity of sensor and signaling system.

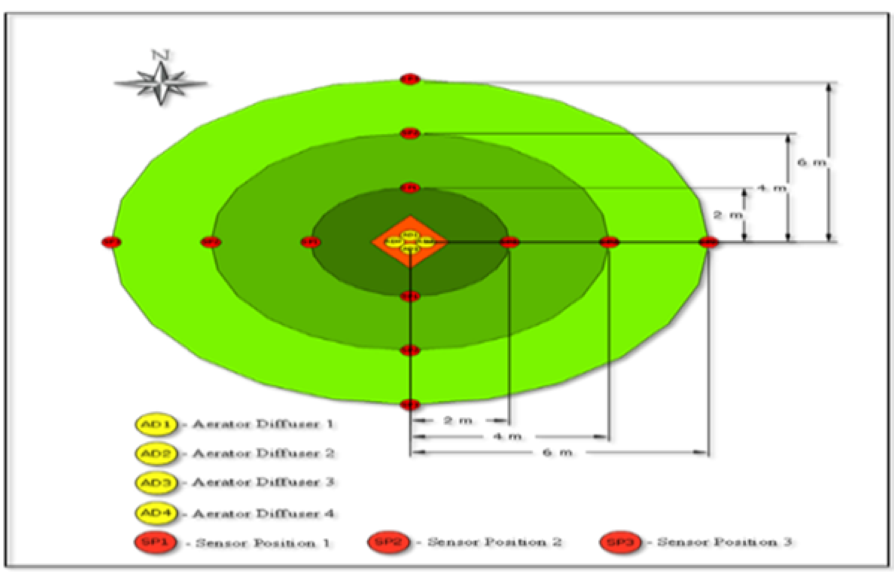

Figure 3. Set-up of SPFTAS and sensor layout for 4 diffusers for measurement of DO concentration at various distances and depth.

Performance and Capabilities Testing and Evaluation

Aeration Performance

The performance evaluation of aerator was measured as either standard oxygen transfer rate (SOTR) or standard aeration efficiency (SAE) and standard oxygen transfer efficiency (SOTE). The SOTR is the amount of oxygen added to the water in one hour under standard conditions expressed as kilograms of O2/hr (APHA, 1985). The SAE is the standard oxygen transfer rate divided by the horsepower (hp) of the unit, expressed as kg of O2/hp-hr transferred to the water (Lawson and Merry, 1993). The SOTE refers to the fraction of oxygen in an input airflow dissolved under the standard condition. It is expressed as SOTR per (kg/s).

The aerator dissolved oxygen transfer capacity. The rate of oxygen transferred by the aerator is the aerator capacity (AC), which is defined as the rate of oxygen transferred in one hour operation divided by dissolved oxygen requirement per liter. It is expressed in cubic-meter per hour. The following formulas were used in the determination of performance parameters:

SOTR = (KL a20) x CS,20 x V (1)

where: SOTR - standard oxygen transfer rate, kg of O_2/hr
K_La_{20} - volumetric mass transfer coefficient at standard condition for measuring probe, temperature 20 and 1 atm, second-1
$C_{S,20}$ - dissolved oxygen saturation concentration at standard condition measuring probe, temperature 20 and 1 atm, mg/L
V- volume of water, m^3

$$SAE = \frac{SOTR}{Power\ Input} \qquad (2)$$

where: SAE - standard aeration efficiency, kg of O_2/kWh
SOTR - standard oxygen transfer rate, kg of O_2/hr
Power Input - aeration power, watts

$$SOTE = \frac{SOTR}{WO_2} \qquad (3)$$

where: SOTE - standard oxygen transfer efficiency
SOTR - standard oxygen transfer rate, kg of O_2/hr
W_{O_2} - mass flow of oxygen in air stream

$$AC = \frac{SOTR}{OR} \qquad (4)$$

where: SOTE - standard oxygen transfer efficiency
OR - oxygen requirement (mg/l)

Test and Evaluation of Dissolved Oxygen Levels

The dissolved oxygen levels of concentration in water using four diffusers at different distances from the device in a given time intervals and water depth were determined as the dispersion of oxygen in the test pond. The performance evaluation of SPFTAS in maintaining dissolved oxygen level was conducted in the fishpond with stocking rate of a 15 fingerlings/m3. The level of DO after the operation was measured to determine the increase of DO level in the water and effectivity of SPFTAS in increasing the level of DO at different time duration. Table 1 shows the performance parameters for the evaluation SPFTAS effectivity and the following threshold values that were used as guide in rating the SPFTAS:

Table 1. Performance parameters for the evaluation SPFTAS effectivity

PARAMETERS	HE	ME	LE	FAIL
DO increase 1 ppm in ≤ 10 min operation	✓			
DO increase 1 ppm in ≤ 15 min operation		✓		
DO increase 1 ppm in ≤ 20 min operation			✓	
DO increase 1 ppm in >20 min operation				✓

Highly effective (HE): when the dissolved oxygen level increase 1 ppm from initial DO level in 10 minutes operation within 2.0 m radius of influence
Moderately effective (ME): when the dissolved oxygen level increase 1 ppm from initial DO level in 15 minutes operation within 2.0 m radius of influence
Less effective (LE): when the dissolved oxygen level increase 1 ppm from initial DO level in 20 minutes operation within 2.0 m radius of influence

Sensitivity of SPFTAS Process Controller

The sensitivity of process controller and signaling system was evaluated based on the timeliness it triggered the aerator to start when the dissolved oxygen level decreased below 3.0 ppm and the time it stopped when the dissolved oxygen level increased above 5.0 ppm. The signal lights were also observed if it had any of the condition set and if the horn sounded the alarm based on the programmed commands. The range of time durations for sensitivity ratings were as follow:

Table 2. Performance parameters for the evaluation ASPFTAS controller sensitivity

PARAMETERS	HS	MS	LS	FAIL
Response in ≤ 5 sec	✓			
Response in > 5 ≤ 10 sec		✓		
Response in > 10 ≤ 30 sec			✓	
Response in > 30 sec				✓

Highly Sensitive (HS): when the system responds within 5 seconds
Moderately Sensitive (MS): when the system responds within 5-10 seconds
Less Sensitive (LS): when the system responds within 10-30 seconds

Data Analysis

The regression analysis was used to describe the effects of different number of diffusers in relation to the dissolved oxygen level in a given time interval, and at different depth ranges. The characteristics of DO using four diffusers were analyzed using univariate analysis. The data were analyzed using SPSS version 22.

Results and Discussions

Aeration Performance and Efficiency

The test results obtained 0.07 kg of oxygen per hour Oxygen Transfer Rate using four (4) diffusers (Petrille, J. and Boyd, C.E., 1984). The Standard Aeration Efficiency obtained was 0.2710 kg of oxygen per hp-hr. The Standard Oxygen Transfer Efficiency attained during the test was 0.36 or equivalent to 18 kg of oxygen mass transferred by aerator into the water. The aeration capacity of ASPFTAS was computed by determining the volume of aerated water in an hour (m3/hr) based on the SOTR obtained. The aeration capacity of machine was 14.0 m3/hr. This is the volume of water that would be supplied by DO (0 ppm to

5 ppm). However, if the initial DO levelled 3 ppm at the start of the aeration process and the target is to increase it to 5 ppm the volume of water that could be aerated will be increased to 35.0 m3/hr.

Dissolved Oxygen (DO) Levels

The evaluation of aeration performance was tested in the pond with a stocking rate of 15 pieces/m3. The stock size ranged from 2-3 cm and it was categorized as fingerlings. The water depth at the time of evaluation was 1.2 m in depth. The evaluation was conducted in 10-, 15- and 20-min aeration test. The results revealed that the dissolved oxygen level increased by 1.32 ppm. Since it exceeds 1.0 ppm after 10 min aeration threshold. The test was rated highly effective. It was also observed that the dissolved oxygen levels increased further after 15 and 20 min of aeration. Figure 4 indicates the levels of dissolved oxygen increased as the time of aeration is prolonged. This indicate that the designed aeration system is capable and has the ability to increase the dissolved oxygen level in the pond with 15 fingerlings/ m3 stocking rate.

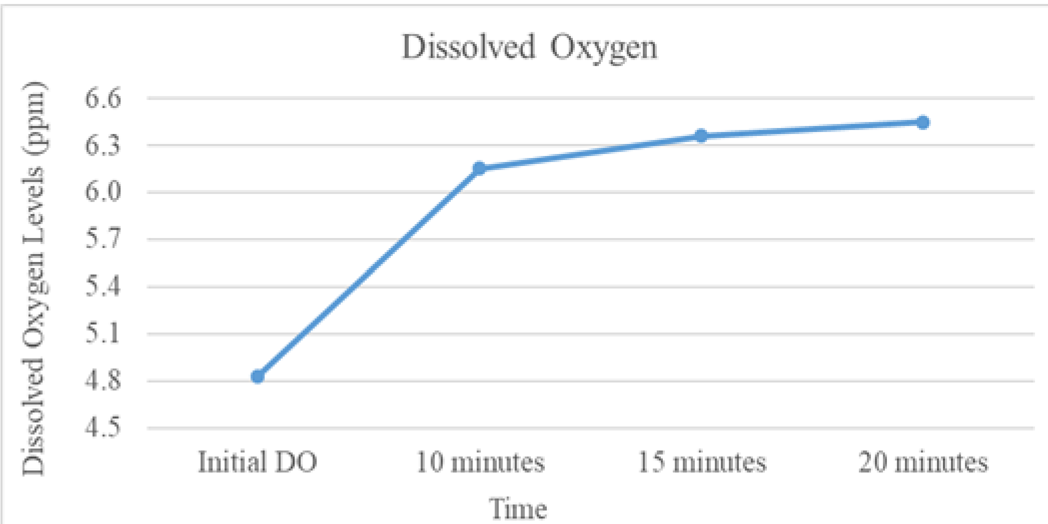

Figure 4. DO levels (ppm) on test evaluation of aeration effectiveness

Performance of ASPFTAS in Dispersing Dissolved Oxygen

The performance of SPFTAS in dispersing dissolved oxygen was evaluated in three parameters: A varying depths from the surface (20 cm), middle (40 cm) and bottom (60 cm); distances at 2 m, 4 m and 6 m from the center, different time intervals of 1 hour, 2 hours and 3 hours.

Dissolved Oxygen at Different Depths and Number of Diffusers

The results on DO without diffusers shows that at the upper water level was higher than the middle and bottom. The results also revealed that the dissolved oxygen was significantly different from every depth. The results on 1, 2 and 3 diffusers show that the DO were highest at the surface than the middle and bottom. The results using 1, 2 and 3 diffusers revealed that the dissolved oxygen levels were highly significant from each depth at different number of diffusers. The results of test using 4 diffusers shows that the DO at the surface was still the highest compared to that on the middle and on the bottom. The results of analysis revealed that the dissolved oxygen levels at different depths were significantly different among each other. Figure 5 shows the dissolved oxygen levels at different depths (20, 40, and 60 cm) using 1, 2, 3 and 4 diffusers.

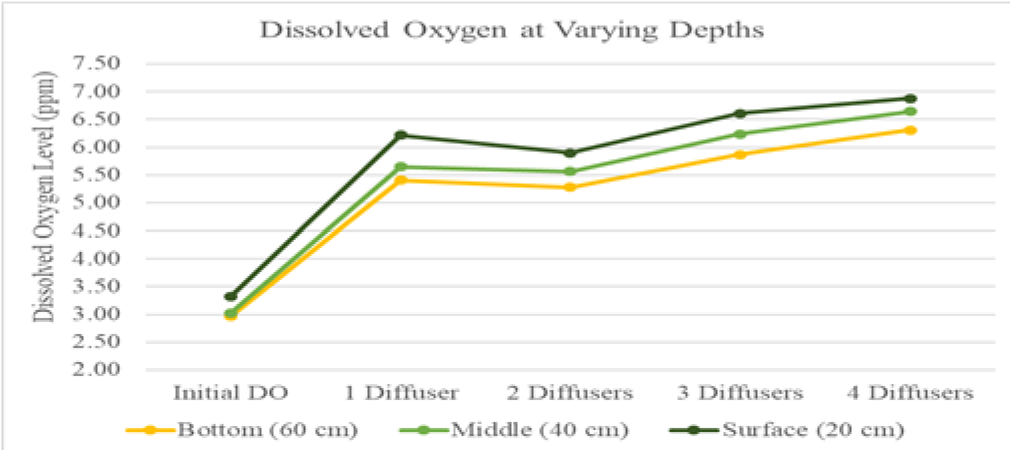

Figure 5. Dissolved Oxygen levels (ppm) at varying depths using 1, 2, 3 and 4 diffusers

Dissolved Oxygen at Distances and Number of Diffusers

The results DO without diffuser showed that at 4 meters from the center was highest among all means. The results also revealed that the dissolved oxygen levels at different distances from the center were significantly different. The results on performance using 1, 2 and 3 diffusers revealed that the DO at the center was still the highest among other distances. The results also showed that the dissolved oxygen levels using the 1, 2 and 3 diffusers at different distances were significantly different from each other. The results on 4 diffusers showed that the DO at the center was higher than the DO at other distances. The results revealed that the dissolved oxygen levels at varying depths were not significantly different from each other using four diffusers. Figure 6 shows the dissolved oxygen levels at different distances (center, 2, 4, and 6 m) using 1, 2, 3 and 4 diffusers.

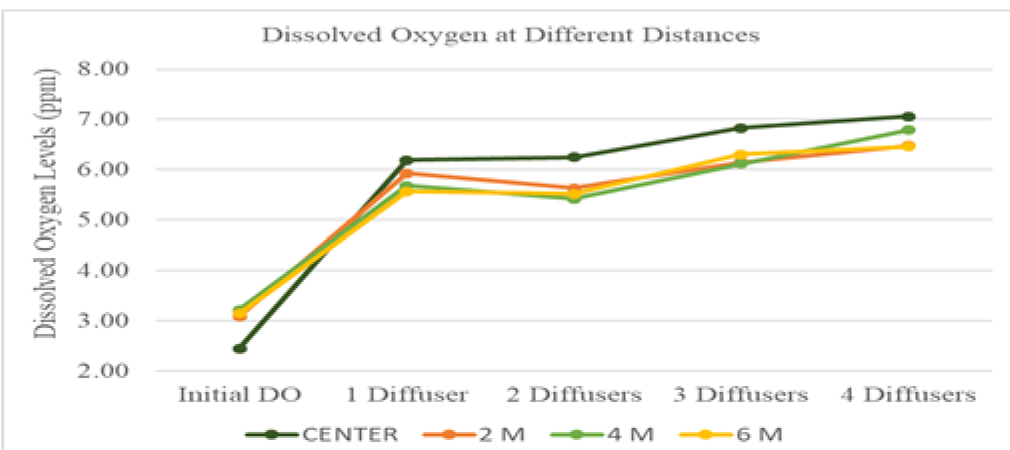

Figure 6. DO levels (ppm) at different distances using 1, 2, 3 and 4 diffusers

Dissolved Oxygen at Time Intervals and Number of Diffusers

The results of performance showed that the DO after three hours of operation was highest among the DO levels at other time durations. The results revealed that the dissolved oxygen levels at different time intervals were significantly different. The results using 2, 3 and 4 diffusers revealed that the DO level after three hours of operation were constantly the highest among the DO levels at other time duration. The results also revealed that the dissolved oxygen levels at different time intervals were highly significant from each other using 2, 3 and 4 diffusers. Figure 7 shows the dissolved oxygen levels at different time intervals (1, 2, and 3 hrs.) using 2, 3 and 4 diffusers.

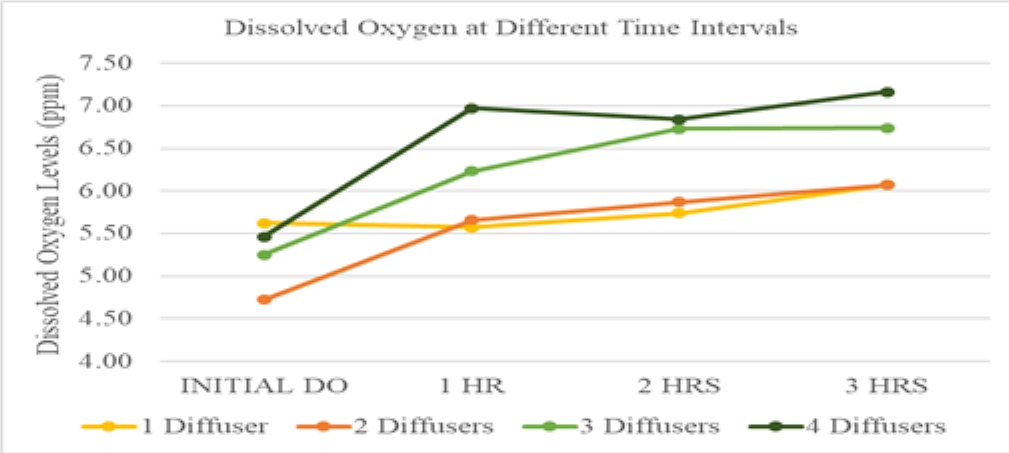

Figure 7. DO levels (ppm) at different time intervals using 1, 2, 3 and 4 diffusers

Dissolved Oxygen Levels Performance

Analysis of the DO levels showed that it was affected by the number of diffusers used, time duration and temperature. The results also revealed that the DO levels using different numbers of diffuser were significant to each other, while the DO levels at different time durations and temperature were highly significant. DO levels at different depths and distances at four orientations (N, E, W, S) were not significant. The results revealed that the DO levels dispersed by using four diffusers had no difference with depths, distances and four orientations. The evaluation of performance involving all the parameters analyzed using multiple regression model had stablished the equation to predict DO level in the pond using SPFTAS. To predict the dissolved oxygen levels in the pond using SPFTAS, the regression equation is as follows:

$$Đ\Theta p = \Gamma + \rho\,(Đ) + \alpha\,(\Omega) + \delta\,(\Phi) + \tau\,(T) + \gamma\,(\Psi)$$

Where: $Đ\Theta p$= DO predicted
Γ= intercept
ρ = coefficient for number of diffusers
$Đ$ = number of diffusers
α =coefficient for depth
Ω = depth
δ= coefficient for distance
Φ = distance
τ = coefficient for time
T = time
γ= coefficient for temperature
Ψ= temperatures

SPFTAS Automation System

Process Controller, Sensor and Signalling System

The results of sensitivity analysis showed that most of the components involved in the automation process, data logging, and transmission of data, signalling and turning-on of aerator were highly sensitive. Most of the components responded within five seconds after initiation of command and functions. The aerator and the yellow light exhibited less sensitive when the DO level was at 5 ppm. The aerator responded 25 seconds after the horn was triggered and the DO level was at 5.0 ppm. This can be attributed to the weak mobile network signal in the area which caused the delay in the sending of data and this made the aerators respond late. Likewise, the signal lights responded late until the last command was initiated. The data transmission was also found to be moderately sensitive. This may be due to the location of the testing area resulting to a week signal transmission. It was observed that only 15 out of the expected 22 messages sent were received through text messages (SMS); resulting in a 68% reliability. Table 58 shows the evaluation of data for the responses of the different component functions.

Table 3. Sensitivity of automation components and signaling system responses to the mode of functions

DO LEVEL MODE	DO (LEVEL)	RESPONSE TIME DELAT OF 1 CYCLE OPERATION							Data Logging	REMARKS
		LED				HORN	Sending Text	AERATOR		
		Yellow	Green	Blue	Red					
DO High	> 5.00	HS	HS				MS		HS	
DO Set Maximum Range	5.00	LS					MS		HS	
DO at Range (decreasing)	5.00 - 3.00	HS		HS			MS		HS	
DO Set Minimum Range	3	HS			HS	HS	MS	HS	HS	
DO Lower	>3	HS			HS		MS		HS	
DO at Range (increasing)	3.00 - 5.00	HS		HS			MS		HS	
DO Set Maximum Range	5.00	LS				HS	MS	LS	HS	MWNSOUTS
DO Increasing	> 5.00	HS	HS				MS		HS	
DO Set Maximum Range	5.00	HS					MS		HS	
DO at Range (decreasing)	5.00 - 3.00	HS		HS			MS		HS	
DO Set Minimum Range	3	HS			HS	HS	MS	HS	HS	
DO Lower	>3	HS			HS		MS		HS	
DO at Range (increasing)	3.00 - 5.00	HS		HS			MS		HS	
DO Set Maximum Range	5.00	LS				HS	MS	LS	HS	MWNSOUTS
DO Increasing	> 5.00	HS					MS		HS	

Conclusion and Recommendations

The general objective of the study was to design and automate a solar powered floating type aeration system to improve dissolved oxygen in the fish pond. Specifically, it evaluated the dissolved oxygen level. In this study, the performance of SPFTAS was evaluated in many aspects. The sensitivity of sensors that initiated the automation mechanism was also evaluated and the responses of components installed. The economic analysis of SPFTAS was also taken. The automated SPFTAS was designed, installed and tested with all its components to improve water quality of fish pond. The SPFTAS was made of fiberglass, with two units of 100-watt solar panel and charge controller, one unit 12 volt-200 ampere-hour deep cycle battery, 12 volts – 220 volts power inverter and 180-watt vortex type aerator. The design could stand in fishpond environment. The sensors, signaling and alarm system triggered the full automation of SPFTAS.

1 The results of the test concluded that the SPFTAS has acceptable Oxygen Transfer Rate (OTR) and Aeration Efficiency (AE). The performance of aeration system in maintaining dissolved oxygen

level in intensive production system (15 pieces per cubic meter) in 20 minutes operation was highly effective in 2 m range and 1 m water depth.

2 The levels of dissolved oxygen dispersed at different depths and distances, and orientations exceeded the 5-ppm maintaining DO level requirement in fish pond using four diffusers. The means of DO levels of different numbers of diffusers used were enough to sustain the requirement and the highest mean reached 6.953 ppm. Therefore, the performance of SPFTAS was enough to improve the water quality in fish pond.

3 The overall performance of SPFTAS was significant at 1, 2, 3, and 4 diffusers, depths, distances and time. While in different orientations there were no significant differences. These results of analysis attested the positive impact of aeration system in terms of uniformed distribution of dissolved oxygen. Based on the results it concluded that the greater the number of diffusers installed, the higher is the DO level at any depth, time and distance. The prediction of device performances was estimated using the equation: $ĐΘp = \Gamma + \rho (Đ) + \alpha (\Omega) + \delta (\Phi) + \tau (T) + \gamma (\Psi)$, with a standard error of 1.44

4 The results of the study on automation indicated that automated SPFTAS was verified as important device in real time monitoring, improving and maintaining water quality as well as in immediate response to the

5 water environment. Findings of the study also attested that the automation, signaling, alarm system, real time data logging and data transmission are developments in research, monitoring and adverse climatic condition. In general, the aeration process controller, sensors, alarm and signaling system are highly sensitive. Therefore, automation of SPFTAS is very much important to address the pressing problems in fish ponds.

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The Potential Use of the Microcontroller-based Automated Disinfection Device (MADD) in Eliminating Bacteria in Fomites

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Abstract - Ultraviolet (UV) radiation has been utilized as a germicidal or disinfectant for many years, particularly in the medical industry. With its potential to eliminate bacteria among fomites or any inanimate object that, when contaminated with or exposed to infectious agents, can transfer disease to a new host like parcels, the study on developing and designing a Microcontroller-based Automated Disinfection Device (MADD) using Arduino that can help eliminate bacteria found on parcels received by online shoppers was conducted during the first semester of the Academic Year 2020-2021 at Quezon City University (QCU). An evolutionary prototyping technique was adopted in developing and testing the MADD. The results show that MADD is durable, efficient, functional, and useful when it comes to disinfecting bacteria found on the surfaces of selected objects. The study concludes that aside from its present use, the microcontroller is useful when developing a technology like MADD, and it can be maximized when it is combined with other devices like the UV C light lamp to disinfect surfaces and objects that are possible carriers of disease-causing agents. Since MADD uses C++ programming language, it is suggested that using other programming languages may improve the device's efficiency. And lastly, improvement on MADD's over-all design and disinfecting ability is highly recommended.

Keywords - Microcontroller-based device, Disinfection device, Ultraviolet radiation disinfection, Fomites, Bacterial disinfection

Introduction

For many years, ultraviolet (UV) radiation has been used as a germicidal or disinfectant, most notably in the medical industry (Reed, 2010). UV lights have been shown in studies to have germicidal properties, which means they kill bacteria and microbes (Levetin, et al. 2001). UV light technology has been used for disinfection purposes for centuries (Menzies, et al. 2003).

Ultraviolet Lights come in a variety of types and are used for a variety of purposes: Ultraviolet A, Ultraviolet B, and Ultraviolet C are the most commonly used in the industry (Hockberger, 2002). Ultraviolet A is a type of ultraviolet light that is less harmful than Ultraviolet B, but approximately 1,000 times less effective than Ultraviolet B and Ultraviolet C, which can cause skin aging and increase the risk of developing unusual skin cancer (Hockberger, 2000). While ultraviolet B is effective at inactivating SARS viruses, it is significantly less effective than ultraviolet C and significantly more dangerous to humans (Reed, 2010; Hockberger, 2002; Hockberger, 2000). UVB radiation is capable of penetrating the skin and eye. This type of Ultraviolet B has the potential to damage deoxyribonucleic acid (DNA), making it one of the risk factors for skin cancer and cataracts. While ultraviolet C is commonly used to disinfect air, water, and nonporous surfaces, it has been used to prevent the spread of bacteria (tuberculosis) for decades and is referred to as germicidal (Beggs, 2006).

SARS-CoV-2, the virus that causes Covid19, is an enveloped virus, which means that its genetic material is enclosed within a protein and lipid outer layer. The envelope contains spike proteins that allow the virus to attach to human cells during infection. SARS-CoV-2, like other enveloped respiratory viruses, has a labile envelope that degrades rapidly when exposed to surfactants found in cleaning agents and under certain environmental conditions. The risk of fomite-mediated transmission is proportional to the community's infection prevalence rate. the amount of virus that infected people expel, the deposition of expelled virus particles onto surfaces (fomites), which is affected by air flow and ventilation, the interaction of virus particles with environmental factors that cause damage to virus particles while airborne and on fomites, the time interval between when a surface becomes contaminated and when a person touches it, the efficiency of virus particle transfer from fomite surfaces to hands and from hands to mucous membranes.

Due to the numerous variables that influence the efficiency of environmental transmission, the relative risk of fomite transmission of SARS-CoV-2 is considered low in comparison to direct contact, droplet transmission, or airborne transmission (Kampf, et al. 2020; Meyerowitz, et al. 2020). However, the proportion of SARS-CoV-2 infections acquired via surface (fomite) transmission is unknown (Kampf, et al. 2020; Meyerowitz, et al. 2020). There have been a few reports of Covid19 cases that may have been transmitted via fomite. Often, infections can be traced back to multiple transmission pathways. Transmission of fomite is difficult to establish conclusively, in part because respiratory transmission via asymptomatic individuals cannot be ruled out (Bae, et al. 2020; Cai, et al. 2020; Xie, et al. 2020). According to case reports, SARS-CoV-2 is spread between people by touching surfaces where an ill person has recently coughed or sneezed and then touching the mouth, nose, or eyes directly (Bae, et al. 2020; Cai, et al. 2020; Xie, et al. 2020). Hand hygiene acts as a barrier to the transmission of fomite and has been linked to a decreased risk of infection (Doung-Ngern, et al. 2020).

Quantitative microbial risk assessment (QMRA) studies have been conducted to characterize and understand the relative risk of SARS-CoV-2 fomite transmission, as well as to determine the need for and effectiveness of risk reduction measures. These studies' findings indicate that the risk of infection with SARS-CoV-2 via the fomite transmission route is low, generally less than 1 in 10,000, which means that each contact with a contaminated surface has a less than 1 in 10,000 chance of causing an infection (Wilson, et al. 2020; Harvey, et al. 2020; Pitol & Julian, 2020). Certain studies estimated exposure risks primarily by analyzing SARS-CoV-2 RNA quantification data from outdoor environments. They noted that their QMRA estimates are subject to uncertainty, which can be reduced by increasing the accuracy and precision of the data used in the models. Outdoor surfaces should have lower infectious SARS-CoV-2 concentrations than indoor surfaces due to air dilution and movement, as well as harsher environmental conditions such as sunlight. Additionally, one QMRA study evaluated the effectiveness of prevention measures for reducing the risk of fomite transmission and discovered that proper hand hygiene can significantly reduce the risk of SARS-CoV-2 transmission from contaminated surfaces, whereas daily surface disinfection had little effect on reducing estimated risks (Pitol & Julian, 2020).

Globally, the Covid19 pandemic has caused crisis and suffering, affecting commerce and trading, as people are fearful of venturing outside their homes to purchase necessities in order to avoid virus infection. With the rise of online shopping and delivery, disinfection becomes a necessity. Currently, a manual disinfection process is used globally, which involves spraying alcohol on the surface and wiping it clean with a clean towel. Online shopping and delivery have become popular and disinfecting the area where packages or parcels are received has become a common practice. The Department of Health (2020) issued Memorandum No. 2020-0157, which contains guidelines for cleaning and disinfecting in a variety of settings as a means of infection prevention and control against Covid19.

According to the guideline, disinfectants such as 70% ethyl alcohol and a strong bleach solution can be used to combat bacteria and viruses that cause Covid19, and it is recommended to mop or wipe surfaces directly or spray disinfectants directly on them. This technique has been implemented and is in use.

With the potential for UV light to kill bacteria on fomites or any inanimate object that, when contaminated or exposed to infectious agents, can transmit disease to a new host, such as parcels, the development of devices for disinfecting surfaces and other objects that can transmit bacterial or viral-causing diseases has become a trend. Microcontrollers are used in a wide variety of applications and systems (Hsiung, 1992). Multiple microcontrollers are frequently used in devices to perform specific tasks, such as an automated disinfection device (Hsiung, 1992).

Hence, research into the development and design of an automated disinfection device is necessary. Thus, the primary goal of this study is to develop a Microcontroller-based Automated Disinfection Device (MADD) based on the Arduino platform that is durable, efficient, functional, and useful for disinfecting and eliminating bacteria found on the surfaces of parcels received by online shoppers.

Methodology

For many years, ultraviolet (UV) radiation has been used as a germicidal or disinfectant, most notably in the medical industry. With the potential to eradicate bacteria from fomites or any inanimate object that, when contaminated or exposed to infectious agents, can transmit disease to a new host, such as parcels, the study on developing and designing a Microcontroller-based Automated Disinfection Device (MADD) using Arduino that can assist in the elimination of bacteria found on parcels received by online shoppers was conducted during the first semester of the Academic Year 2020-2021 at Quezon City University (QCU).

To address the objectives of the study, the evolutionary prototyping technique was adopted in developing and testing the Microcontroller-based Automated Disinfection Device or MADD. Figure 1 shows the prototyping model used in the study.

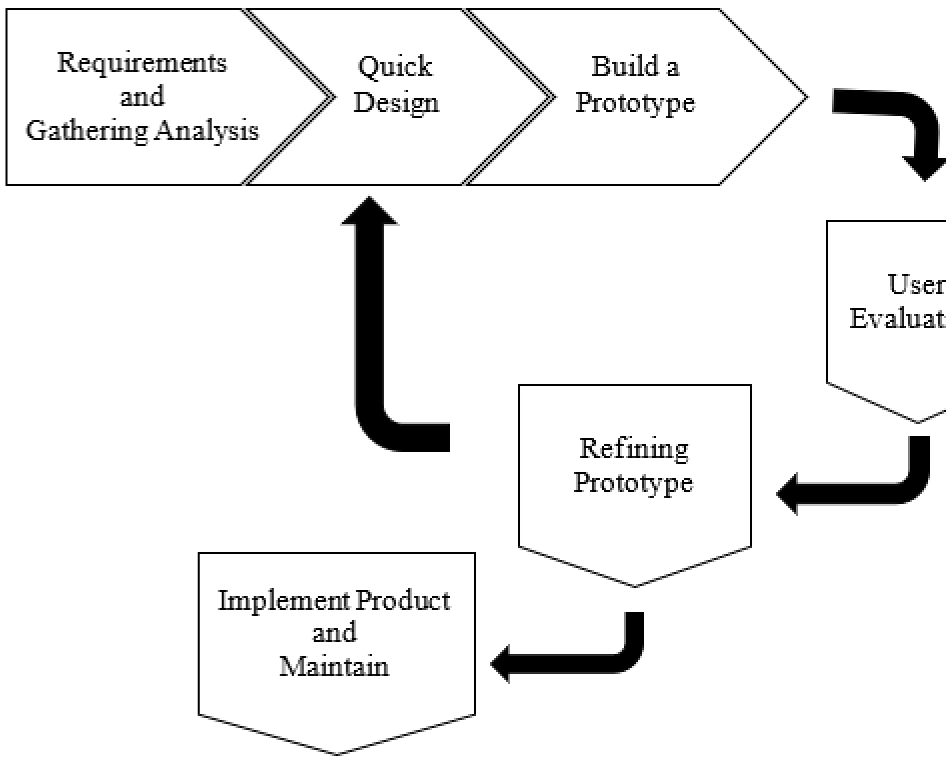


Figure 1. Prototyping Model

The first stage of the process in developing the Microcontroller-based Automated Disinfection Device (MADD) involves the identification of the existing needs, problems and formulating the objectives. After the needs, problems and objectives were clearly identified, the researchers come up with the design of the model which primarily helped them to visualize the final output. This stage is known as the quick design phase of prototyping, at this point, the researchers did the layout of the design of the model and made a sketch where each components of the model would be placed. Also, in this phase the researcher created a circuit diagram design (see figure 2) to describe and show how each component would be interfaced in the circuit board and to other parts of the prototype.

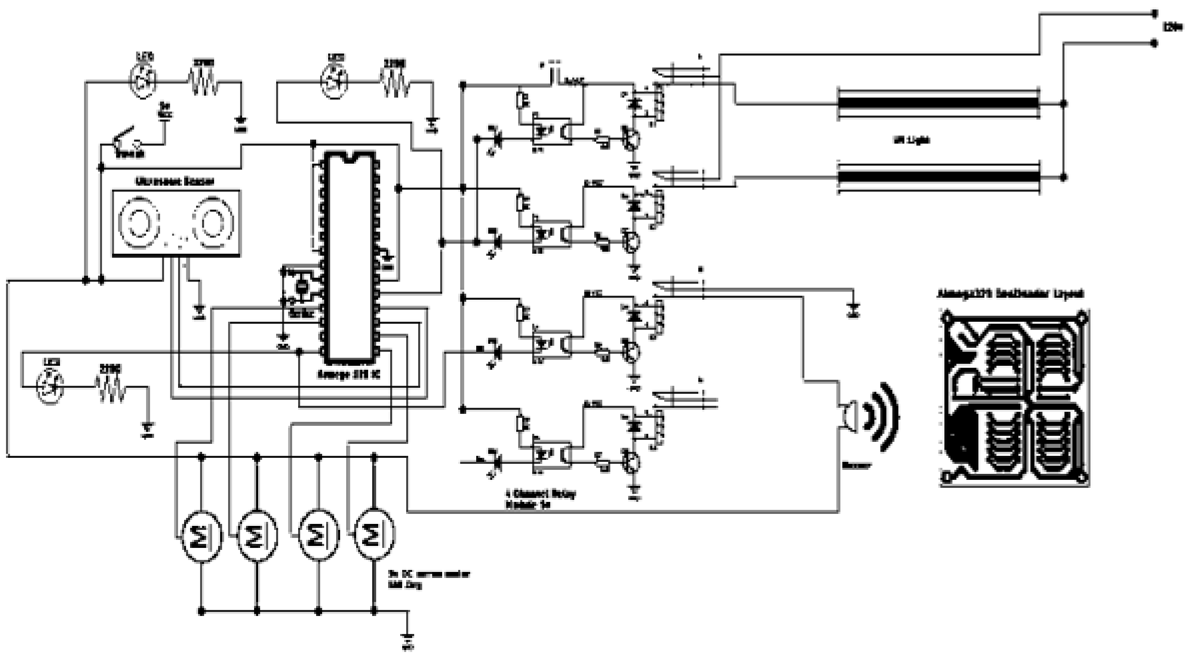


Figure 2. Schematic Circuit Diagram

As shown in figure 2, the components of the MADD were interfaced and connected properly. The signal input of servo motors in pairs are connected to ATmega328 microcontroller to open the doors of the device, and the UV lamp and buzzer were connected to the relay module, which is connected to ATmega328 microcontroller to switch it on once the parcel is inside the device.

Software development of the device was also included in building the prototype. The primary function of the program is to initiate the disinfection process by animating the device itself with the help of sensor recognition, ATmega328 microcontroller, and UV light lamp. The program used was C++ using Arduino IDE. Arduino IDE supports programming languages C and C++. The proponents decided to use the C++ among the programing languages supported by Arduino IDE. Studies shows that C++ being one of the programming languages supported by Arduino Programming Language based on performance is way better than C language in terms of speed, compatibility, memory and point of emphasis. The process flowchart that guided the entire process involved within the device is presented in figure 3.

Figure 3 shows that the components involved in the processes were the ultrasonic sensor, servo motors, relay modules and the UV light lamps. The input signal comes from the ultrasonic sensor and it sends to ATmega328. If signal received does not satisfy the condition, it will repeat the loop until the condition satisfies and proceed to the next condition and execute the disinfection.

After the prototype development, the users evaluated the device in terms of its functionality and usefulness when it comes to disinfecting bacteria.

The device is supposed to achieve a 90 to 95% functionality rate. The researchers tested the device's the functionality of the switch to determine whether the sensor responded and recognized the items upfront. During the process of the evaluation, the researcher inspected the device whether the servo motors responded to inanimate the device's doors and observed if the relay module reacts to turn on the UV light and the buzzer. In addition, the researchers observed the LED light indicator to determine if the ATmega328 microcontroller processed the programming language embedded to it and if the UV light is working properly.

The switch was tested if it allowed a sufficient power supply to flow through the device. And then the sensors were tested if they were recognizing the item accordingly. The servo motors were tested if they responded as quickly as one second to open the doors of the device from zero to one hundred degrees within ten seconds and close after the same time frame. Furthermore, the relay module was tested if it reacted accordingly by switching on and off the UV light and the buzzer. Also, the microcontroller was tested if it controlled the required operations in the system. And lastly, the UV light was tested if it responded properly when the microcontroller sends the signal to the relay module by switching it on.

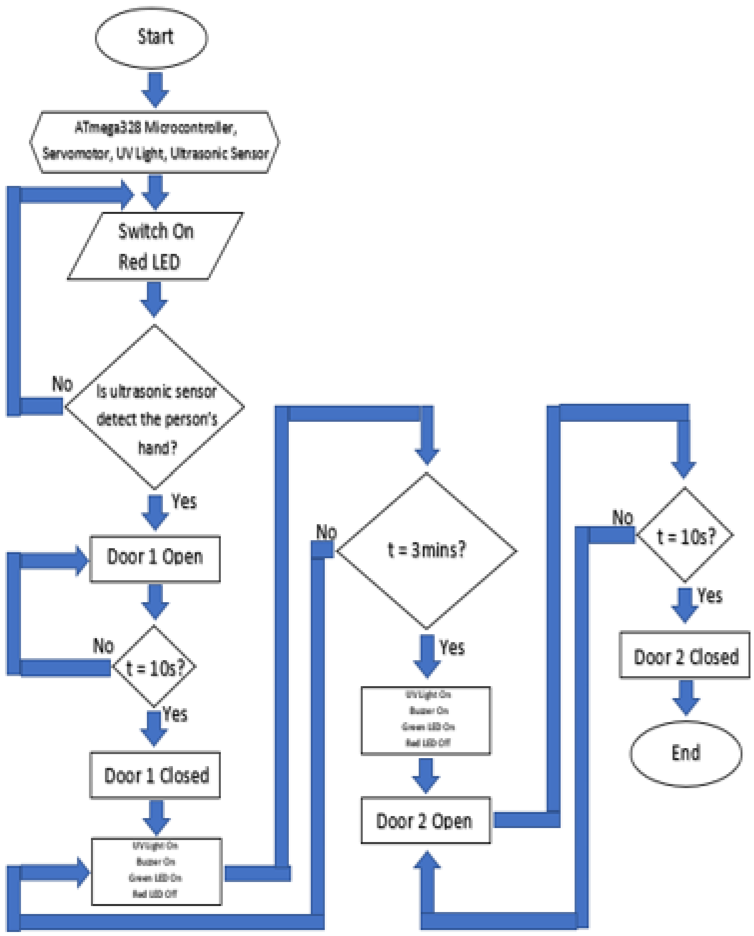


Figure 3. The Process Flowchart

To check the functionality of the system, they conducted multiple tests to validate that the module, sensors, and components of the system were functional.

To determine usefulness of the device in terms of eliminating bacteria in fomites, the third author conducted a bacterial analysis using bacteria gram staning technique before and after the parcel and other objects placed in the device. There were four samples placed inside the device labeled as SP1 for the surface of online shopping bag, SP2 for the surface of a Twenty Peso bill, SP3 for the surface of a ballpoint pen (SP3), and SP4 for the surface of a face shield commonly used as personal protective device to Covid19 virus. The amount of bacteria present in fomites of these samples were tested and compared before and after to establish how MADD is useful in eliminating bacteria in fomites.

After the user's evaluation phase, the prototype was refined. At this stage, suitable adjustments were made based on the results of the evaluation phase. And lastly, in the final stage of the prototype development, the final output was deployed, operated, and maintained for use.

Results and Discussions

Microcontroller-based Automated Disinfection Device (MADD)

The developed Microcontroller-based Automated Disinfection Device (MADD) is shown in the figure 4. The prototype is mainly composed of ultrasonic sensor, servo motor, relay, switch, and ultraviolet light. The ultrasonic sensor is interface with the microcontroller, once triggered, it will position the servo motor to ninety degrees, opening the front door. The front door remains open within 10 seconds and close afterwards. After the door closes, the ultraviolet light lamp will be turned on and emit light for disinfection process. Once the disinfection process is done, the back door of the device will open, and the user can pull out the parcel inside the device.

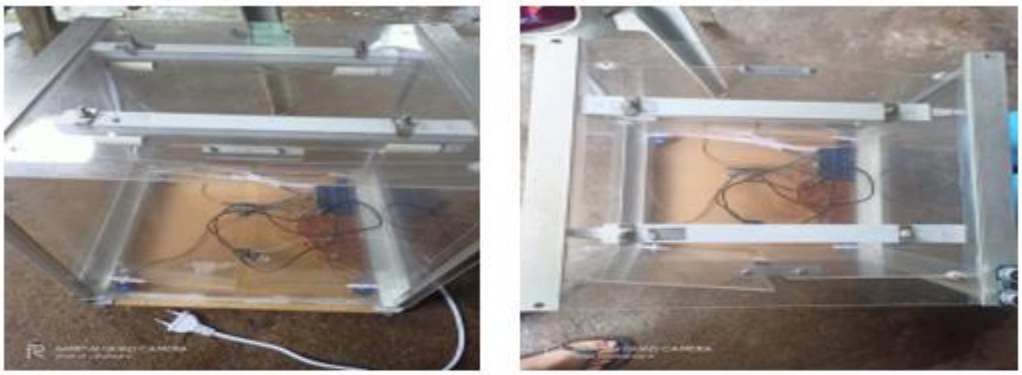


Figure 4. Microcontroller-based Automated Disinfection Device (MADD)

Assessment of the Microcontroller-based Automated Disinfection Device (MADD)

The functionality test used to check the ultrasonic sensor, servo motor, relay module, LED indicators, Atmega328 microcontroller and UV light revealed that these components are functional. Table 1 shows the result of the functionality test performed to the different components of the device.

The results showed that all the components of the MADD gained a positive remark, thus the push button switch, ultrasonic sensor, servo motor, relay module, ATMEGA 328 microcontroller, UV light and the buzzer found in the device were all functional.

Specifically, by pressing the switch on, the device automatically turned on, and when the evaluator pressed the off button, the device automatically turned off. In the actual test, the device successfully detected the hand of the user 5cm away from it. The distance primarily sensible to achieve contact less process when inserting the parcel or products inside the device. In addition, the device did not open when the hand of the user is beyond the 5cm distance from the detector.

Table 1. Summary of the Functionality Test to the Components of MADD

Components and Modules	No. of Functional Requirements	Test Case	Remarks
Push-button Switch	1	10	Passed
HC-SR04 Ultrasonic Sensor	1	10	Passed
SG90 Micro Servo Motor	4	10	Passed
4 Channel Relay Module 5v	1	10	Passed
LED	3	10	Passed
ATmega328 Microcontroller	1	10	Passed
UV Lamp	1	10	Passed
Buzzer	1	10	Passed

Furthermore, the actual test shows that the door of the device successfully opened and closed using servo motor from 0 degree to 100 degrees and vice versa. And in terms of the relay module of the device, the actual test shows that the relay module successfully operates and controls the buzzer and UV light by turning it on and off.

The LED light indicator test revealed that the green and red LEDs are turned on and off successfully by the microcontroller. And being the brain of the device, the ATmega328 microcontroller via C++ program, successfully sends signals to the relay module, servo motor, and LED-based on the program. And lastly, during the actual test, the UV light automatically turned on as well as the buzzer when the object is placed inside the device and turned off immediately after three minutes, to completely disinfect the object. Based on the studies, the duration of the exposure of the object under UV light allows to disinfect the object completely.

Since the device is a microcontroller based, it allows MADD to execute sequence of instructions and process that will enable to disinfect fomites of selected samples used in the study. The ATmega328 microcontroller used in the device was able to perform the expected task. The results supported the claim of Hsiung in 1992 that microcontrollers like the ATmega328p microcontroller completely perform specific tasks, such as disinfecting the surfaces of the samples specifically and accurately. Furthermore, the results show how the ultrasonic sensor allows the device to open its door from zero to ninety degrees with servo motor, which able to detect objects at a certain distance, that allows contactless feature of the device.

Usefulness of the Microcontroller-based Automated Disinfection Device (MADD) on Eliminating Bacteria in Fomites

Results show that the developed Microcontroller-based Automated Disinfection Device (MADD) is useful on eliminating bacteria in fomites.

Table 2. Results of the Bacterial Staining Technique to the Samples Before Using MADD

Sample	Presence/Absence	Quantity	Morphology	Type
SP1	Present	Many	rod (bacilli)	Gram +
SP2	Present	Many	spherical (cocci), rod (bacilli)	Gram + Gram -
SP3	Present	Many	rod (bacilli)	Gram +
SP4	Present	Many	spherical (cocci), rod (bacilli)	Gram + Gram -

As shown in Table 2, the surface of the sample materials being tested shows the presence of gram-positive and gram-negative bacterial cells in a cluster/group as elaborated in figure 4.

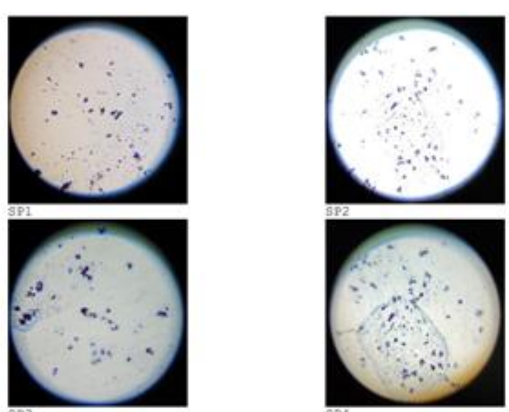


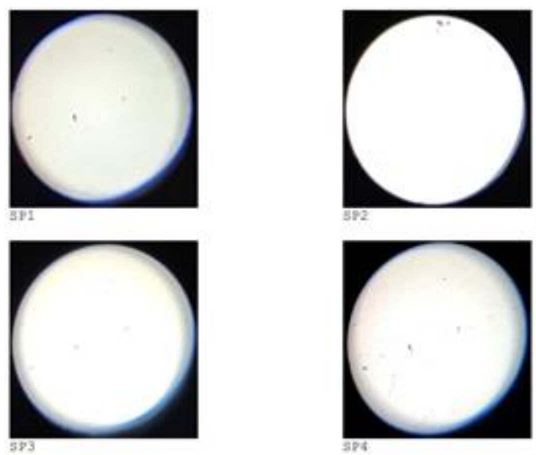
Figure 4. Bacterial Presence in Fomites of the Samples Before the Use of Microcontroller-based Automated Disinfection Device (MADD)

On the other hand, Table 3 shows the results of the bacteria gram staining technique on the surfaces of the samples after they were exposed to UV light using MADD.

Table 3. Results of the Bacterial Staining Technique to the Samples After Using MADD

Sample	Presence/Absence	Quantity	Morphology	Type
SP1	Present	Few	rod (bacilli)	Gram +
SP2	Present	Few	spherical (cocci)	Gram +
SP3	Absent	None	rod (bacilli)	Gram +
SP4	Present	Few	spherical (cocci), rod (bacilli)	Gram + Gram -

Table 3 revealed that the surface of the sample materials being tested shows a presence to none of mostly gram-positive and some gram-negative bacterial cells in a cluster or group as elaborated in figure 5.



The above results confirm and support previous studies about the use of UV light as germicidal or disinfectant (Reed, 2010). The comparison between the results of the gram staining technique on fomites of selected samples shows that UV lights have germicidal properties, which can eliminate bacteria and microbes (Levetin, et al. 2001). Furthermore, the results confirm that UV light technology can be used for disinfection purposes (Menzies, et al. 2003).

Conclusion and Recommendations

The study concludes that aside from its present use, the microcontroller is useful when developing a technology like the Microcontroller-based Automated Disinfection Device (MADD), and it can be maximized when it is combined with other devices like the UV light lamp to disinfect fomites of objects that are potential carriers of disease-causing agents. Since MADD uses C++ programming language, it is suggested that using other programming languages may improve the device's efficiency. And lastly, improvement on MADD's over-all design and disinfecting ability is highly recommended.

Acknowledgement

The authors would like to thank Dr. Racidon P. Bernarte, QCU Vice-President for Research, Extension, Planning and Linkages, Dr. Bradford Antonio C. Martinez, QCU Vice-President for Academic Affairs, Prof. Pia Angelina C. Tan, QCU OIC Vice-President for Administration, and Dr. Theresita V. Atienza, QCU President for their encouragement and support in the conduct of this study. The authors would also like to acknowledge the support of their family and close friends.

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