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IN THIS ISSUE:

Vision and Mission of the IJODeL

Vision

To be a leading international academic journal that publishes and disseminates new knowledge and information, and innovative best practices in open and distance e-learning.

Mission

The IJODeL shall publish and disseminate new knowledge and information based on original research, book reviews, critical analyses of ODeL projects and undertakings from various researchers and experts in the Philippines, the ASEAN Region, and the world, and concept articles with the intention of presenting new ideas and innovative approaches to interpreting and implementing best practices in open and distance e-learning as alternative delivery mechanisms for quality education.

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technology + teaching + learning

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About the Cover

Whether a mouse-click, a quick touch, a tripod grip, a handhold, a thumbs up, a tap on the shoulder our hand and finger gestures say a lot about how we human beings enact learning.

Now, more than ever, enabled by technology the human experience of ODeL is diverse, reflective and transformative. That's a given.

We at the Faculty of Education do so because we care about the here and now— sound pedagogies, student welfare and success, which drive research, teacher education and the design of learning, simply because the teaching and learning cannot wait. Technology must therefore keep up with our minds and hands to do what we do best - be humans.

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Board of Directors and Editorial Team

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Editorial

Technology-Mediated Teaching-Learning Process: From Developing of Learning Materials to Classroom Management and Practices to Students' Welfare

Technology-mediated teaching-learning process has been in the limelight when academic institutions worldwide shifted to remote teaching and learning modality due to the COVID-19 pandemic. Such a process has been viewed as the best option to allow for teaching and learning continuity. Though the modality has existed long before the COVID-19 pandemic, it continues to be tapped universally in the K-12 and tertiary level settings. Hence, it is important to examine the technology-mediated teaching-learning process during the pre-pandemic and pandemic periods in order to understand how it works under normal and new normal conditions in this ever-changing educational landscape.

This special issue aims to create a venue for sharing research projects on how collaborations among educators and other stakeholders in the education sector responded to the call for technology-mediated teaching-learning. The articles published in this issue provide information on (a) design principles for the development of technology-mediated modules for teaching practical mathematics in the basic education; (b) teaching and assessment practices that can address online learners' needs, especially in a general education course; (c) the change of students' welfare as universities shifted to the remote teaching and learning approach; and (d) factors that can contribute to the creation of a positive climate and behavior management in a flipped classroom with peer instruction. These articles hope to provide insights and possibilities to other academic institutions at the crossroads of establishing their own technology-mediated education programs.

The article of Benedicto Norberto V. Aves and Monalisa M. Te-Sasing affirms the place of a design-based research approach in the development of technology-mediated learning materials for the teaching of practical Mathematics in a technical-vocational education. The study shows that the modules developed provided a better learning experience for students. It emphasizes the role of the online learning teacher as facilitator, feedback giver, and mentor mediating the overall learning process. The study highlights the criticality of design in considering the new role of teachers, i.e., as facilitators of the learning process. Instead of occupying the traditional role of the teacher as authority figure, teachers are now able to relinquish to their students the right to make the final decisions with regards to the time and place of their learning.

In addressing the needs of distance education learners, Mabini DG. Dizon's article examines the students' perception of what it means to be a successful student. The study highlights the need for the faculty-in-charge to create more avenues for student socialization and interaction and to provide timely responses to students' messages. It suggests that the assessment of learning in an online learning environment should consider the practical application of knowledge as well as the timelines for requirement submissions. The article engages instructors and teachers to consider their ways to help learners balance their academic and non-academic responsibilities.

Analyzing the change in students' welfare under the remote teaching and learning modality, Patrick C. de Leon's article provides empirical information to academic institutions planning to shift to the remote teaching and learning modality. The study reports that students' welfare has not been affected significantly with the shift. As such, it supports the institutional policies

of the Commission on Higher Education that mandated higher education institutions to shift to such the remote teaching and learning modality.

The article by Aprhodite M. Macale and co-authors provides information on how to create a positive learning environment as well as manage students' behavior in a flipped classroom. It suggests that promoting a positive climate for learning and behavioral management must consider transparency in the use of the modality, i.e., students should be informed on what and how to use the modality. There is also the need to effectively design the face-to-face set-up to maximize student-to-student interactions in keeping with the online learning expectations. The materials used in online learning must also be comprehensible to the students. Lastly, the study affirms the shared responsibility among the teacher and the students when it comes classroom behavior management in both virtual and physical settings.

With this set of articles, we hope this special issue covering empirical information will inspire creative thinking and reflection among our readers - those who are intent on establishing technology-mediated education in their institutions or those who are heeding the call to enhance their teaching and learning processes to reduce the students' apprehension with such a modality. We hope that readers can use examples from these studies to ensure effective teaching-learning transactions in the best way possible amid challenging circumstances.

Ricardo T. Bagarinao, Ph.D.
Juliet Aleta R. Villanueva, Ph.D.

Design Research Approach in Developing Technology-Mediated Learning Modules in Practical Mathematics for Technical Vocational Education

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Abstract

Technical vocational education has become one of the four major tracks in the K to 12 curriculum in the Philippines (Ocampo, 2014). However, online learning technologies are not yet fully integrated into the core technical-vocational courses of this curriculum. Using the design research model of Mckenney and Reeves (2013) with two iterations, this study developed a set of technology-mediated learning modules in practical mathematics for the technical-vocational track of the K to 12 curriculum. From three researcher-made instruments, data were gathered from randomly selected samples from a private sectarian college. Results indicate that the design research modules were characterized by the following design principles: a) small-group collaborative learning through synchronous and asynchronous discussions based on simplified authentic problem-based tasks; b) online teaching roles as a facilitator, feedback giver, learning community mentor, course designer, and manager; c) use of Facebook and its online group chat; d) use of multimedia approach, behavioral objectives, simple language, and exercises in the presentation of the modules; and e) student context based on job skills specialization, motivation and interest in practical mathematics, familiarity with information and communication technology, and socio-economic status. Using the Mann-Whitney test at 0.05 significance level, the overall mean score of the second iteration group is significantly higher than the overall mean score of the first iteration group. This indicates that the technology-mediated learning modules facilitated the learning of practical mathematics concepts. This study recommends the design research approach because its iteration process has validated and put together effective design principles for online teaching and learning of practical mathematics. Further, it has involved both students and the teacher in developing these modules that yielded better student learning outcomes.

Keywords: *design research, practical mathematics, technology-mediated learning modules, design principles*

Introduction

Countries like Australia, Canada, and China as well as the European Community, have used online learning as the latest or dominant mode of delivery for the instruction for learners of vocational education (China Online Education Report, 2014; Stevens, 2001). In the Philippines, several short-term courses were offered by the Technical Education and Skills Development Authority (TESDA) through online learning technology. However, online learning technologies are not yet fully integrated into technical vocational education, currently a major track of the K to 12 curriculum (Ocampo, 2014). Such integration to a technical vocational course like practical mathematics may yield an online learning environment of convenience, instructor availability, and student engagement, especially to students who are time bound – due to work or distance – or place bound – due to far location or physical limitations (Juan et al., 2011).

An ongoing large body of literature shows that the online learning format is an effective way of building the learning engagement of students (Lewis & Allen 2005; McConnell, 2006). Moreover,

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this distant mode of learning yields prospects for promoting a reflective and collaborative learning environment (Koh & Hill, 2009; Land & Dornisch, 2001). From the instructors' point of view, they found online teaching advantageous because they can: a) plan their courses ahead of time; b) maintain personal communications with their students; c) have access to a variety of students; d) gain opportunity to improve their pedagogical skills; and e) have more control over the learning environment (Telmesani, 2010).

The sustained effort for a technology-based mathematics curriculum has mediated online learning of mathematics. Such technology has provided tools that make online learning more convenient, effective, and engaging.

The computing technology – like the scientific and graphing calculators and computer programs with varied mathematical functions – has freed up learners from the mechanical task of calculating and allowed them to discern and explore mathematics (Heid, 1988). The multimedia presentation of mathematical knowledge through digital boards and the Internet has fostered greater student engagement and connected mathematics abstractions to the real world (diSessa, 2001).

To develop these technology-mediated learning modules, this study used design research as an approach that is characterized as interventionist, iterative, process-oriented, utility-oriented, and theory-oriented (Kelly, 2003). This approach offers a twofold yield: a research-based intervention and a generation or validation of theories (Plomp & Nieveen, 2013). The first yield is a research-based intervention to solve a complex problem in educational practice. The second yield is a set of validated design strategies to strengthen educational learning practices in learning and teaching practical mathematics in an online environment. Also, this set of validated design strategies may add to the body of knowledge of developing technology-mediated learning modules in the mathematics curriculum of technical vocational schools.

Objectives of the Study

The study aimed to develop technology-mediated learning modules in practical mathematics for the technical-vocational track of the K to 12 curriculum following the design research approach. To address this, the study—

1. identified the characteristics of technology-mediated learning modules in practical mathematics for the technical-vocational track in terms of a) context of the students; b) online learning approach; c) roles of the online teacher; d) technology tools used; and e) presentation of the online learning modules; and

2. determined how the first iteration group and second iteration group differ in terms of student's evaluation of the effectiveness of the technology-mediated learning modules in practical mathematics.

Conceptual Framework

Figure 1

The conceptual framework of the study

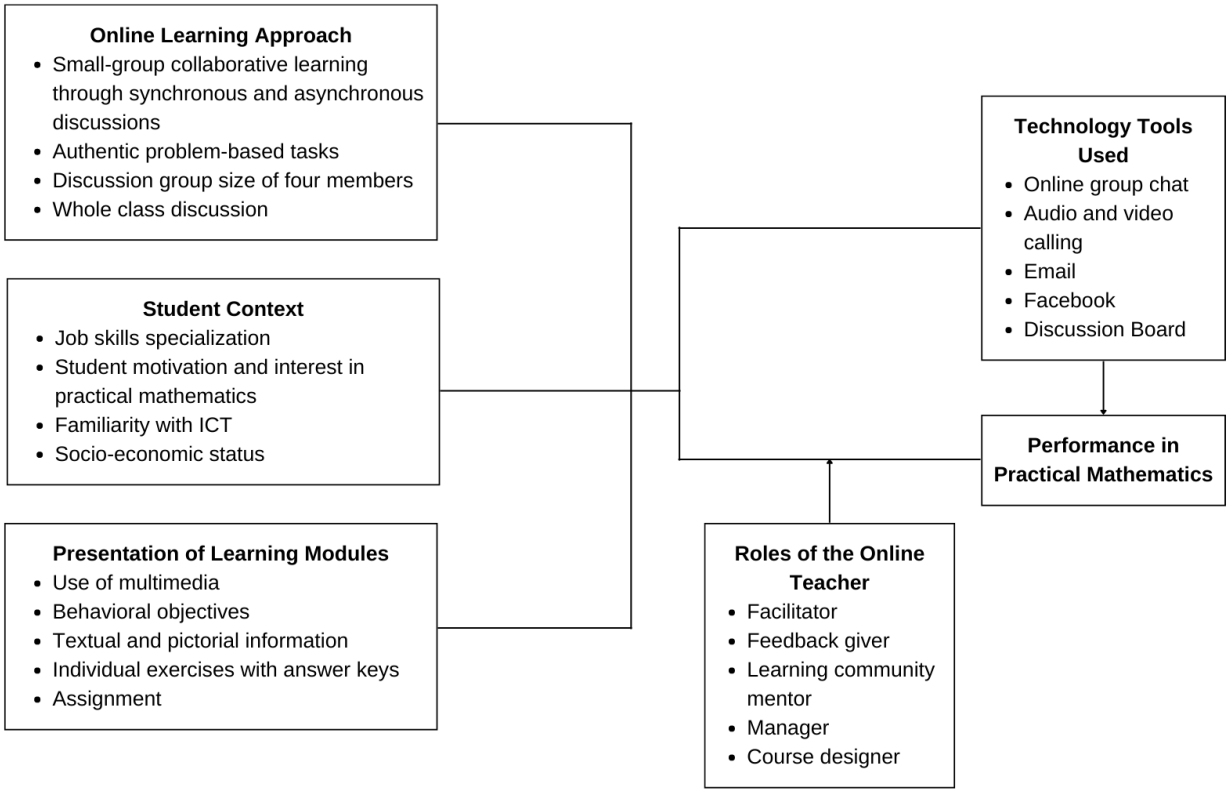


Figure 1 shows the conceptual framework of developing technology-mediated learning modules in practical mathematics using design research. The variables in the framework include the following: performance in practical mathematics, student context, online learning approach, roles of the online teacher, technology tools used, and presentation of the learning modules.

The student context is based on the personal characteristics and background of the student participants. These include the job skills specialization, motivation and interest in mathematics, familiarity with ICT, and economic status. The focus of the mathematics curriculum in technical vocational education should be the basic content of mathematics, not its higher content (Rose, 2012). Students who intend to specialize in welding and other technical vocational skills must master basic mathematics skills like the four fundamental operations, conversions of units, calculations on algebraic expressions, and computations of ratios and percentages. Student motivation and interest in mathematics are better addressed by online learning with problem-based tasks contextualized in real-world settings. These problem-based tasks with a variety of vocational contexts are embedded in UK vocational curriculum (Hodgen & Marks, 2013) and have been found useful for US vocational students with poor motivations to learn mathematics (ACTE Issue Brief, 2009). Students born in the 21st century have been described as digital natives, being raised in an environment surrounded by ICT (Prensky, 2005). Thus, the technical-vocational students of the 21st century are expected to be comfortable and familiar with the use of ICT tools like Internet-based tools. The challenge for these students, however, is the continued access to the Internet since many of them came from low-income groups (Foley, 2007). Hence, any online course in mathematics extended to these students should take into consideration their economic status.

The online learning approach is anchored on the social constructivism of Vygotsky (1978) that states that a learner constructs knowledge through the process of social interaction with others. Following Vygotsky's theory, learners of the study, as a whole class or small groups of size four, used collaborative learning through synchronous or asynchronous discussions. The whole class discussion was found to be a significant factor in students' interactions in online courses (Hewitt & Brett, 2017). Small group size enhances group work and discussion and is best conducive for collaborative learning (Du et al., 2007; Fernandez, 2007). To maximize interactions in a group, collaborative learning was organized around a problem-based task, which was contextualized in a real-world setting. This authentic task comes from real-world situations and promotes communication and collaborative learning (Jennings, 2006).

The zone of proximal development, Vygotsky's dominant construct, showed a zone in between what a learner can achieve independently and what he may achieve with scaffolding. Scaffolding may come from the teacher or the more experienced peers. The online teacher should thus, be a facilitator and a guide on the side rather than a sage on the stage. As a facilitator, the teacher should also assume other effective online teaching roles, including pedagogic, social, and managerial roles, as Berge (1995) proposed. Berge (1995) posited that the assumption of these roles would help an online teacher become a better guide of students, a good learning community mentor, a timely feedback giver, an effective manager, and a course designer.

The technology tools used in the study consist of a social network site and Internet-based tools. The educational platform of the study is a social network site that is good support for collaborative learning and serious deliberations (Gross, 2004; Mazman & Usluel, 2010). The asynchronous and synchronous classes utilize the Internet and Internet-based tools including e-mails, discussion boards, video and voice calling, video streaming, instant messaging (IM), and uploading and downloading functions.

The cognitive theory of multimedia learning (Mayer, 2001) and cognitive load theory (Sweller & Chandler, 1991) have been applied in the presentation of the learning modules. The first theory states that readers will understand the material better when words and pictures are presented compared to words only. In the latter theory, an extraneous load—how information is presented to the learners—may come in two forms: either in verbal or spatial form. Between the two forms, the spatial form reduces the extraneous load, thus enabling the limited cognitive resource to process the intrinsic load and germane load. Using the multimedia learning theory and cognitive load theory, the learning module of the conceptual framework does not only contain textual and pictorial information but also video information on the lesson of the day. The multimedia presentation of the lesson is very helpful in student construction of knowledge and in enhancing a constructivist learning environment (Neo & Neo, 2003).

A learning module in the framework of the study has a set of learning objectives, based on the cognitive domain of Bloom's Taxonomy. The domain caters to the acquisition of knowledge and the development of intellectual skills (Bloom et al., 1956). In this study, a set of learning objectives, in hierarchical order, serves as goals of the learning process, which learners must pursue and achieve after studying a learning module.

In this conceptual framework, the dependent variable is the test outcome in practical mathematics and the independent variables are student context, online learning approach, and presentation of the online learning modules. Student participants—who have mastered the skills and knowledge in basic mathematics, are exposed to the vocational contexts of their chosen specialization,

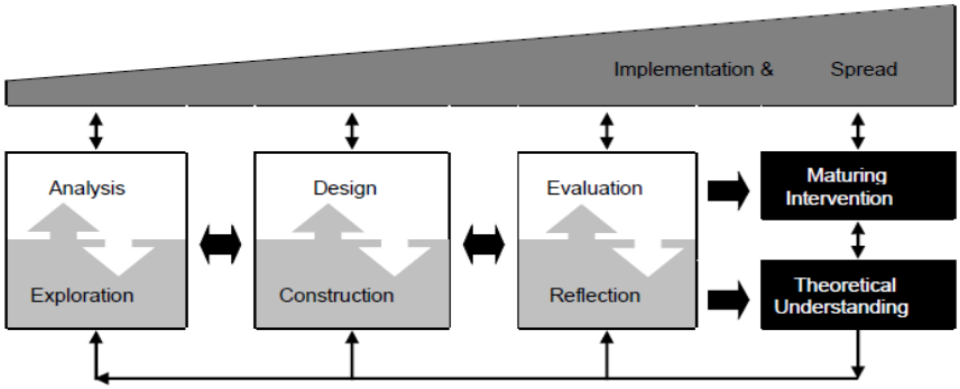
are familiar with Internet-based tools, and are motivated to study mathematics—are likely to perform better in the practical mathematics test. With the use of the online learning approach and presentation of online learning modules, they are also expected to achieve the same student outcome. The mediator variable of the study is the use of technology tools of the study. In the absence of these technology tools, online learning in practical mathematics is not possible. The moderator variable of the study is the assumption of roles of the online teacher. How effective the assumption of these roles by the teacher will either weaken or strengthen the relationship between the independent variables and dependent variable of the study.

Methodology

Figure 2 shows the research design of the study that made use of Mckenney and Reeves's (2013) design research model. Based on this model, the research and development process of the study (see Figure 3) started with the analysis of the problem and a literature review on developing online modules. The outcome of the initial phase informed the tasks of the next phase: selection of design principles and construction of tentative online modules. These tentative modules were tried out in the two-iteration implementation of the study. Each iteration ended with evaluation and reflection which was the last phase for improvement or further improvement of the modules. The process culminated in producing two outputs: the theoretical output consisting of validated design principles and the practical output consisting of the improved online learning modules.

Figure 2

Design research model of Mckenney and Reeves (2013)



Participants of the Study

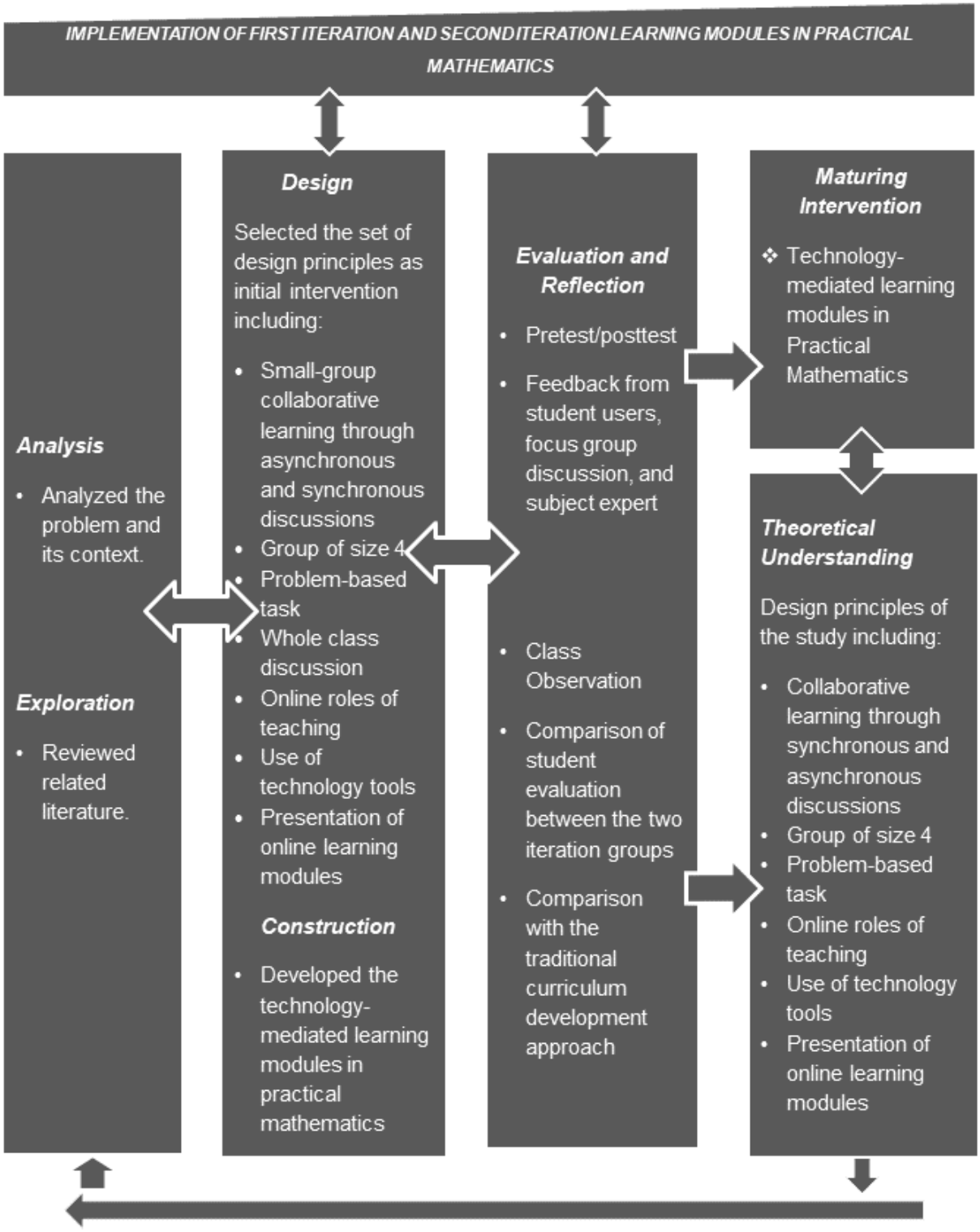
For the first iteration, the participants involved twelve Grade 11 students enrolled in the technical vocational institute and senior high school of a private sectarian college in Southern Philippines. In the second iteration, another twelve Grade 11 students, also enrolled at that private sectarian college in the pioneering technical-vocational track, joined the study to try out the three technology-mediated learning modules in practical mathematics, which were already modified based on the results of the first iteration.

Research Instruments

This study used three researcher-made instruments, namely, an evaluation rubric, an observation guide, and a semi-structured interview protocol. A panel of two subject experts was asked to examine and establish the content validity of these three instruments.

Figure 3

Research and development process of the study based on the research model of Mckenney and Reeves



Technology-Mediated Learning Modules in Mathematics

Using the design research approach, three (3) technology-mediated learning modules were developed based on the three (3) topics found in the training regulations for "Shielded Metal Arc Welding" (SMAW) NC II. These three topics, which include conversion of units, calculations

on algebraic expressions, and computation of ratio and percentages, are particularly taken from the training regulations' common competency entitled, "Perform Industry Calculations". These topics cover seven (7) lessons. Each of these lessons has the following activities:

1. *Problem roll-out*. An online teacher, as a facilitator, would inform each small discussion group on what was expected of them in this activity. After reading the problem and its sub-questions, members of each group had to discuss among themselves what they knew about the problem, what they needed to know, and the potential next steps that they knew about.

2. *Student work time.* As the next activity, each small group would work on the potential next steps that they knew about. Here, an online teacher would ask some probing questions beginning with what, how, or why— leading the students to the right process or desired outcomes. A teacher could also remind them of prior knowledge, as stated after the lesson objectives, to be helpful in the analysis towards solving the sub-questions of a problem-based task.

3. *Workshop.* In this activity, an online teacher would announce that each small group could avail of a workshop should they come to the potential next steps of the problem that required what they needed to know. This entailed watching a video tutorial on what they needed to know about the problem. They could replay any portion of the video presentation as needed. To reinforce what they learned from the video tutorial, the group would be given a set of exercises to answer. Afterwards, an online teacher would direct the group to self-check their answers through the answer key as uploaded on the educational platform of the study.

4. *Sharing and discussion.* This next lesson activity would allow a volunteer group to present and discuss their output before the whole class. An online forum, facilitated by an online teacher, would follow. Groups, especially those struggling ones, could ask clarificatory questions; other groups could comment on the presentation of a group's output. Here, an online teacher could also comment or ask questions to ensure that what was presented to the whole class was accurate and clear for proper guidance of those groups who had difficulty performing the problem-based task of a lesson.

5. *Student work time.* The group could use this time to revise or completely write the solutions to the questions of the problem-based task. This activity could be capped by groups doing some extension work.

6. *Final action on the problem.* At this time, the groups would submit reports of their outputs that included solutions or mathematical justifications to the main question and sub-questions of the problem-based task. An online teacher would then score and comment on these submissions. Upon teacher's feedback, these corrected outputs would be returned to the groups for reflection on any errors committed or to keep them as part of the review materials. Also, the group would work on an assignment, an extension work but not a required submission, to reinforce what they have learned from a lesson.

Each lesson is composed of a video tutorial, helpful notes from a video tutorial, an answer key, and a solution key to an assignment.

Implementation of First and Second Iterations of the Design Process

In the first iteration implementation, 12 participants were divided into three (3) small discussion groups. Each group of four (4) members was provided with a Facebook group account. The participants tried out the first iteration of learning modules for seven weeks. In this online implementation, the researcher was the facilitator, and a high school mathematics teacher was the class observer who observed the researcher's facilitation as well as the small groups that tried out the learning modules. Of the 12 participants who joined the first iteration, eight (8) completed the study while four (4) dropped out. After completing the online study that lasted for seven weeks, these eight participants answered the evaluation rubric in order to rate the learning modules they tried out. Moreover, six (6) of these participants were interviewed by the researcher using the interview protocol. The gathered data from the participants, the class observer, and the researcher served as the feedback of the study. These feedbacks were used to improve the first iteration of the learning modules.

In the second iteration, another group of 12 participants used the modified learning modules. These participants were divided into three (3) small discussion groups. Assigned with a Facebook group account, each small group of four members tried out the modules for seven (7) weeks. The researcher facilitated these discussions and observed the groups that tried out the learning modules. Upon completion of the seven-week online study, all 12 participants answered the evaluation rubric, and five (5) of them were interviewed by the researcher. Feedback gathered from the participants and observer were analyzed and used for further refinement of the second iteration learning modules.

Data Analysis

This study used qualitative and quantitative techniques in analyzing the data gathered in this study. In both iterations of the study, descriptive statistics were generated to describe the evaluation of the learning modules by the students and the class observer. The four ratings in the evaluation rubric were described as excellent, good, fair, and needs improvement. From excellent to needs improvement, these ratings were coded as 4, 3, 2, and 1, respectively. Based on the data obtained from the evaluation rubric, this study used percentage scores to characterize the design principles of the study. Mean scores were computed to determine the overall student evaluation of the effectiveness and usability of the first and second iteration modules. To establish how well the technology-mediated modules facilitated the learning of the concepts in practical mathematics, the Mann-Whitney test was used to compare the mean scores from the evaluation rubric of the first and second iteration groups. Moreover, observation and interview data were analyzed as follows: a) coding of responses, b) validating the codes, c) identifying themes, and d) consolidating themes and information. The results of which were also used to characterize the design principles of the study.

Ethical Considerations

Research participants were informed about the purpose of the study and that their participation is voluntary and for educational use only. To ensure data privacy and confidentiality, no sensitive and personal information was gathered from the participants and their responses were treated with anonymity.

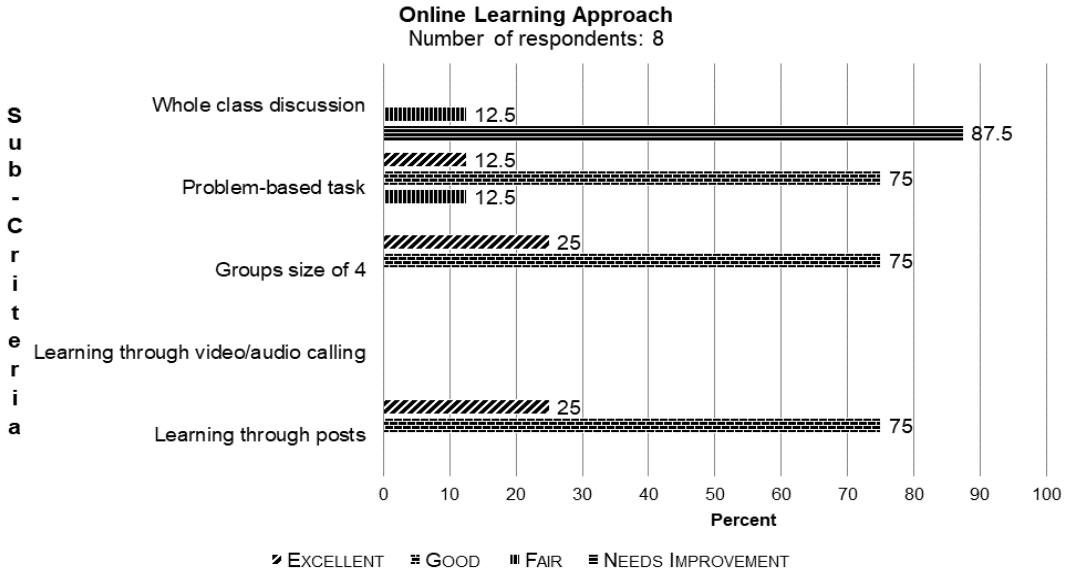
Results and Discussion

Characterizing the Technology-Mediated Learning Modules

Student Context. The majority of the first iteration participants were enrolled in a manual arc welding course. With a mean age of 17.1 years old, these participants, who are 21st century learners, were observed by the facilitator and class observer to be proficient in the use of Internet-based tools. The breadwinners of the participants' families were either laborers or tricycle drivers. The second iteration participants also shared the same context with the first iteration participants.

Figure 4

First iteration participants' perception of the online learning approach in practical mathematics



Online Learning Approach. Figure 4 shows the first iteration results of the design principles that constitute the learning approach of the study. Learning through video or audio calls, which was not possible at that time due to poor Internet connection, was excluded from being rated by the participants. Majority of the participants rated these design principles including learning through posts, having a group size of four, and answering problem-based tasks with good. This indicates that the participants were able to learn collaboratively as they can communicate their ideas well and understand and learn from other's ideas through posts. This was also observed by the researcher and the class observer as they found the participants to be learning well using the open chat in a synchronous manner. One theme from the interview of selected participants shows that they were able to discuss well with the other members of the group and that the exchange of ideas during the online discussion was good.

A good rating on the small discussion group indicates that at least three out of four participants are interacting and helping each other perform the lesson tasks during the iteration. This student perception on size of discussion group would favor the advocates of small group size who argued that the best collaborative learning takes place in a group of two to six students (Barkley et al., 2005). The student interviewees also found a small group size conducive to synchronous discussion, but the shared output on the discussion board and the ensuing whole class discussion were not useful. As also observed by the class observer and researcher, the presentation of the shared output on the discussion board did not generate a class-wide interaction. Each small group

was more involved in their online group chat with the facilitator when they performed a problem-based task. In the succeeding learning modules, not one group asked for a presentation of the shared output on the discussion board. A good rating on the problem-based task indicates that the participants were 75% sure of their solutions and had enough time to perform the task and submit the output on or before the scheduled deadline. A theme from the interview responses was best expressed by one participant: "I find the problem-based task of a module not so difficult." This was also the general observation of the class observer and researcher.

In general, improvements made on the first iteration modules in terms of the online learning approach include the following: a) encouraging asynchronous discussions on identified areas of problem-based tasks that require longer reflection; and b) introducing changes for better illustration and simplification of some problem-based tasks.

In the second iteration, another group of participants, who tried out the improved first iteration modules, rated the collaborative learning through posting of ideas on group chats as excellent. By also rating it as "good," the second iteration participants affirmed the first iteration result of the size of the discussion group. When compared to the perception of the first iteration participants on the problem-based task, the perception of the second iteration participants has further improved with more than 50% of them rating the problem-based task as excellent.

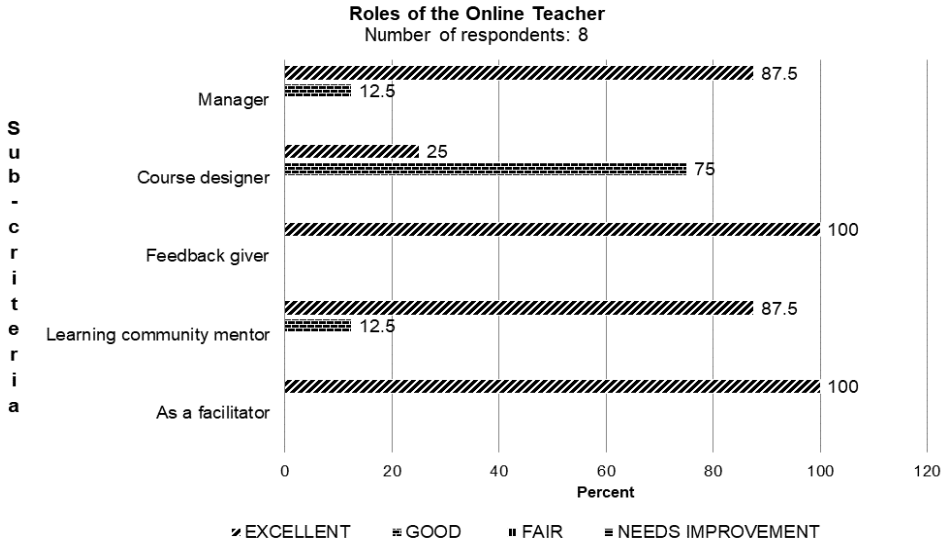
After the second iteration, as a further improvement on the online learning approach, more asynchronous discussions were integrated into some lessons, and the members of the discussion group were reduced to three.

Roles of the online teacher. Figure 5 shows the design principles for the roles of the online teacher. Except for the course designer role, all were rated excellent by the majority of the first iteration participants. Interview responses of participants on the assumed roles of facilitator and feedback giver were characterized by the following remarks:

a. "Our facilitator is always present in every discussion and guiding us in every task.
b. "Feedback was great."

Figure 5

First iteration participants' perception of roles of the online teacher in practical mathematics



When asked how they experienced the social presence of the online teacher as a learning community mentor, most of the interviewees stated that they felt such presence during group work and reported that the teacher knew them well. The class observer noted that this was evident in the self-introduction of the online teacher as well as the opportunity given to the participants to introduce themselves. As an excellent manager, the online teacher was perceived to have given a very satisfactory orientation on the house rules of online learning and to have provided satisfactory responses to all the participants' concerns and questions that affect online learning of this course. Such management tasks were also noted as evident by the class observer.

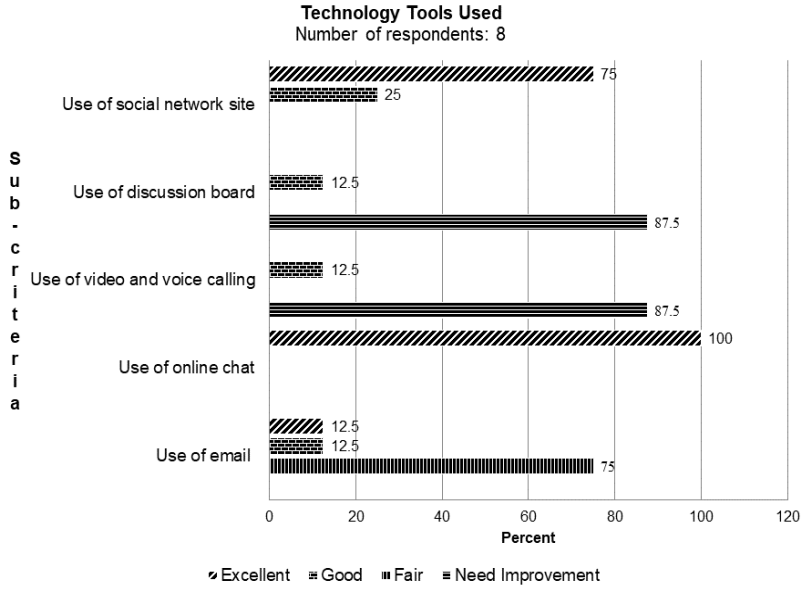
Majority, at 67 percent, perceived the online teacher to be a good course designer because they found the activities in all seven lessons were well-thought-out and well-organized. Upon closer examination of the technology-mediated learning modules, instructions were clear, and lesson objectives were also clear, measurable, and achievable.

No further improvement was made on the design principles for online teacher roles in the first iteration as these principles were maintained in the second iteration.

The second iteration participants rated all the assumed roles of online teaching, including course designing rated as good in the first iteration, as excellent. The themes that emerged from the interview responses of the second-iteration participants on the assumption of roles of online teaching were similar to the themes identified in the first iteration.

Figure 6

First iteration participants' perception of the technology tools used in learning practical mathematics



Technology tools used. Figure 6 shows all the first iteration participants perceived online chat as an excellent tool to communicate ideas about what they know and how to solve a lesson's problem-based task. The majority viewed Facebook as an excellent social network site for the study because it provided the most conducive platform for online learning of the modules. The participants, as observed by the class observer and the researcher, enjoyed the ease and convenience of using Facebook because the site provided them with tools like instant messaging and file sharing in discussing and performing a problem-based task at hand.

Most of the participants found video or voice calls for online learning as one area that needs improvement. Based on the interview of selected participants, they could not use these technology tools to discuss a lesson because of the connection issues encountered in the various Internet cafes they visited. Poor Internet connection was also highly evident during the observations of the researcher and class observer. It was further noted that the participants did not use the discussion board to see a shared output and discuss it class-wide. This was due to the participants' preference for a small group discussion guided by a facilitator over a class-wide discussion. Majority of the participants rated fair on the use of email, which indicates that it was the least used by the participants during the online study. This also emerged as a theme from the interview responses on the use of email by the participants. Although email can be a good tool for asynchronous discussion, many of its functionalities such as uploading and downloading, are also provided by Facebook, the groups' chosen social network site. Facebook has provided faster and more convenient services that include instant messaging, uploading and downloading files and pictures, and video and audio calling to the participants.

As an improvement on the first iteration modules in terms of technology tools used, the use of email, video and voice calls, and discussion board was removed. Thus, the second iteration participants utilized Facebook and its group chats as available tools for online learning, which they rated as excellent.

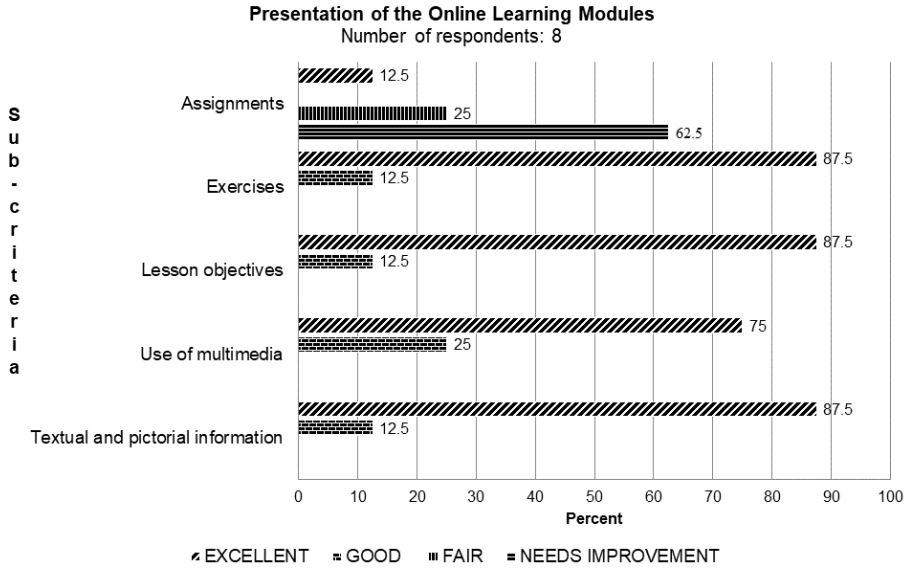
Presentation of online learning modules. Figure 7 shows that the majority of the first iteration participants rated the following design principles— textual and pictorial information, use of multimedia, lesson objectives, and exercises, as excellent. Themes from the interview responses of selected participants, which supported student perception included:

1. The video tutorials were "good, especially to those who lacked knowledge on the lesson," "clear and effective," and enhanced the social presence of the facilitator.
2. Helpful notes "provided a good concept so that we won't forget the important inputs coming from the video tutorials," and "helped us develop our skills and understanding of the lesson."
3. The textual information contained instructions and words which were clear and well-understood.
4. The pictures were highly motivating and interesting.
5. Lesson objectives were clear, measurable, and achievable in most modules.

Most of the participants found the assignment an unattractive task to work on after performing all the lesson activities, including problem-based task. Besides, an assignment in a lesson was not part of the required submission to the online teacher.

Figure 7

First iteration participants' perceptions of the presentation of technology-mediated learning modules in practical mathematics



As an improvement on the online learning modules, two lesson activities— sharing and discussion and making the assignments— were removed from the first iteration learning modules in practical mathematics.

In the second iteration, only half of the participants rated excellent on the use of multimedia, and textual and pictorial information. The slow Internet connection must have accounted for a decline in the proportions of participants who rated both design principles as excellent, from more than 50% in the first iteration to just 50% in the second iteration. For instance, when interviewed participants of the second iteration were asked about the tutorials in video format, some commented that the video tutorials helped them understand the lesson well, but others were unable to view the video tutorials because of their weak Internet connection. Thus, they had to rely on the notes provided to them to help them learn what they needed to know. On lesson objectives and individual exercises, 75% of the second iteration participants rated them as excellent; these perceptions were similar to those of the majority of the first iteration participants.

The themes that emerged from the coded responses of the second iteration interviewees were similar to those themes obtained in the first iteration.

Student Evaluation of the Learning Modules' Effectiveness

Table 1 shows the mean scores of the four clusters of the evaluation rubric for the first and second iterations. An overall mean score, which is the average of the scores on the 15 sub-criteria of the evaluation rubric, is computed for each of the two iterations.

Table 1

Mean Scores of Student Perceptions of the Technology-Mediated Learning Modules in Practical Mathematics by Cluster

Cluster	Mean Scores (First Iteration)	Descriptive Ratings	Mean Scores (Second Iteration)	Descriptive Ratings
Online learning approach	2.8	Good	3.3	Good
Roles of the online teacher	3.8	Excellent	3.9	Excellent
Technology tools used	2.8	Good	3.7	Excellent
Presentation of the online learning modules	3.3	Excellent	3.7	Excellent
Overall mean score	3.2	Good	3.7	Excellent
Number of respondents	8		12	

Using the Mann-Whitney test in Table 2, this study performed a two-tailed test to determine any significant difference in the mean scores of the evaluation rubric between the first iteration group and the second iteration group. Table 2 shows the test results at 0.05 significance level with n1=8 and n2 = 12. Since the computed U-value = 0 is less than the critical U = 22 at $p<0.05$, the null hypothesis is rejected in that the overall mean score of the second iteration group is significantly higher than the overall mean score of the first iteration group. This result shows a significant improvement of the overall student evaluation from a good rating of the first iteration modules to an excellent rating of the second iteration modules. This further indicates that the technology-mediated learning modules facilitated the learning of practical mathematics concepts.

Reconceptualized Framework

Several changes, consisting of a major one and other minor ones, were integrated in the reconceptualized framework (see Figure 8).

As the major difference between the two frameworks, the cluster of design principles for the presentation of learning modules has been reassigned from being an independent variable in the conceptual framework to a moderator variable in the reconceptualized framework.

As a minor difference between the two frameworks, one lesson activity in the conceptual framework —the assignment – was taken out from the cluster of present learning modules of the re-conceptualized framework.

Although the cluster of design principles for the online learning approach is maintained as an independent variable, some minor changes from this cluster, have been made part of the reconceptualized framework. These minor ones, further differentiating between the two frameworks, include: a) more emphasis on the use of asynchronous discussions; b) simplification of the authentic problem-based task; and c) reduction of discussion group size from four to three members.

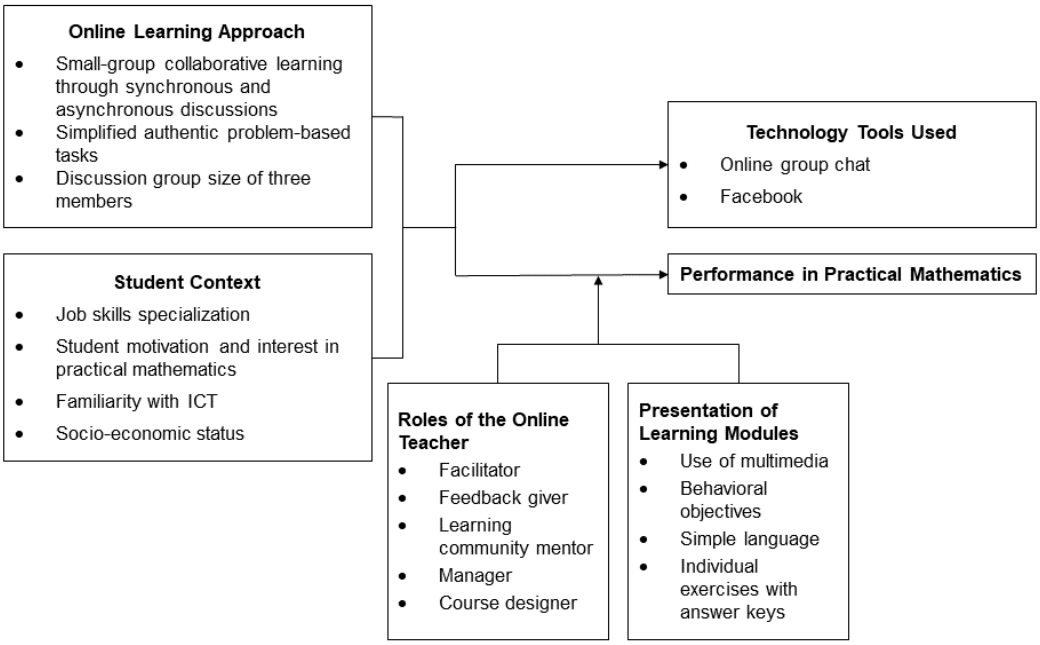
Student context is still maintained as an independent variable in the re-conceptualized framework. The personal characteristics and background of the first iteration group—in terms of job skills specialization, student motivation and interest in mathematics, familiarity with ICT, and socio-economic status—were similar to those of the second iteration group. There is, however, one exception that provides a distinction between the two frameworks. A student participant in the re-conceptualized framework has a greater interest in the study of practical mathematics than a student participant in the conceptual framework.

In terms of technology tools used in the study, its cluster of design principles is still maintained as the mediator variable, making possible the relationship between the two independent variables and the dependent variable of the study. In the re-conceptualized framework, some changes were introduced to the technology tools used to support the learning needs of the participants. These included the removal of emails and discussion boards from the cluster of design principles. Because of weak Internet connection, other synchronous tools like video and audio calls were not available for use in the study and had to be removed from the available tools in the reconceptualized framework.

Another cluster of design principles, roles of the online teacher has moderated the relationship between the online learning approach and test performance. As perceived by the participants, class observer, and researcher in both iterations, the excellent teaching roles facilitated the online learning process and thus strengthened such relationships.

Figure 8

The re-conceptualized framework of developing technology-mediated learning modules in practical mathematics using design research



Conclusions and Recommendations

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

1. The technology-mediated learning modules in practical mathematics, developed using the design research approach, have facilitated the learning of practical mathematics

concepts. A typical student participant, enrolled in a shielded manual arc welding course, is interested in studying practical mathematics and finds the mathematical tasks and level of difficulty of these modules manageable. The problem-based tasks with vocational contexts are relevant to his plan to find work after graduation from senior high school. The technology tools used like Facebook and open chat have well-supported the participants' preferred mode of learning—collaborative learning through synchronous or asynchronous discussions. The student participants communicate their ideas well in the open chat, track and understand others' posted ideas, and learn from others' posted ideas. The discussion group size of three is conducive for online collaboration as the size elicits active discussion from all the group members of the present study. The assumed roles of facilitating and giving feedback guide each small group discussion very well, keep the participants fully engaged on the problem-based tasks, and provide complete feedback on the exercises and group outputs.

2. The other assumed roles—learning community mentoring, course designing, and managing—highly satisfy the participants' learning needs and non-academic concerns, organize the activities of the modules, and create a community of learners among student participants. The multimedia presentation of the modules helps participants understand more deeply the lessons of the modules. Words used are simple and easy to understand while the set of exercises helps the participants master the practical mathematics concepts.

The findings of the study imply great importance in developing learning modules towards achieving the desired outcomes in an open and distance e-learning platform. Any such process may either contribute to or hinder achieving those desired goals. As shown in this study, the design research approach was found to approximate the best possible outcomes of online teaching and learning in practical mathematics. Thus, the following recommendations are made:

1. Course designers, who want to develop online learning modules for the mathematics curriculum of the technical vocational track of the K to 12 programs, should use design research approach because its iteration process, involving both students and teachers in developing the modules, yields a theoretical output for effective online teaching and learning of mathematics.

2. The design research modules of the study can be used for online learning and teaching on the seven lessons of practical mathematics because these modules proved to have facilitated the learning of practical mathematics concepts.

3. For further research, another design research study on developing technology-mediated learning modules in Geometry and Trigonometry may be conducted. Using the same design research process, future studies should consider the following:

    a. Increase the number of student participants;
    b. Provide the participants with continued access to a strong Internet connection; and
    c. Use a classroom-based comparison group.

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Addressing the Needs of Distance Education Learners Based on their Perception of a Successful Student

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Abstract

The study aimed at determining possible teaching and assessment practices in a general education course to better address a range of distance education learners' needs based on a thematic analysis of their graded learning activity reports on students' perception of success submitted by 147 learners of a general education course offered in an open education institution in the Philippines.

Analysis of data revealed that a huge majority (70%) of the students perceive success as the ability to "combine academic and non-academic life well," while manifesting the following traits, "disciplined, great at time management, can apply what was learned in the classroom to real-life situations, an all-rounder, good character, and good social life." Almost half of the students (49%) assessed themselves as not successful. Based on the students' impression, majority (68%) of their parents define success as "excelling academically in a prestigious university and getting a high-paying job;" while most (68%) of their friends perceive success as the "ability to combine academic and non-academic initiatives well." Almost all (95%) of the students said they were challenged by the views of their parents on student success.

Based on the results, the following teaching and assessment practices are recommended: (1) FICs should provide more engagement avenues to encourage socialization or interaction, e.g., conducting F2F synchronous interaction even on a limited basis, and should respond to emails or portal chats as soon as possible to help students strike a good balance between academic and non-academic achievements, their most popular definition of students' success; (2) Learning assessments can be made more practical as these should prepare the learner to use classroom knowledge at work or can be applied in their daily lives; (3) Learning assessments can be made more doable and within a realistic time frame to help students fulfill course requirements; and (4) Module topics can be reexamined to assess if they can be streamlined for a more efficient and/or effective conduct of the course's learning outcomes.

Keywords: *distance learners, student success, academic excellence, general education, tertiary education*

Introduction

The researcher has been teaching General Education (GE) courses for undergraduate students at an institution of higher learning for many years now. She had that similar chance with an open education institution in the Philippines for a semester when she was assigned as a Faculty-in-Charge (FIC) of a general education course, COMM 10 (Critical Perspectives in Communication) in distance education mode.

In the syllabus, COMM 10 is described as a course that explores how communication takes place in various levels of human interaction: interpersonal or group, mass or public, intercultural and

workplace. It is in these spheres that students are able to forge individual and collective identities, and make sense of their interactions, not only with others but also with institutions that impact their thoughts, feelings, and actions. As students interact with individuals and institutions, they need to be armed with various lenses for them to have a more critical and meaningful engagement with issues and concerns of communication in local and global contexts.

One module in the course, where 175 enrolled students are most participative in, is Module 3 entitled, "Communication and Identity Construction." The concept of identity construction was based on the Communication Theory of Identity (CTI) as developed by the scholars Jung and Hecht (2004). According to them, CTI is a layered theory that conceptualizes identity as experienced at multiple levels or frames, multifaceted and dynamic, and communicated both verbally and behaviorally in diverse ways evolving over time.

In the current study, the focus was on the first level of identity, that is, the personal identity, defined as an individual's self-concepts or self-images, existing at the individual level of analysis. More specifically, the focus was on the learners' images of a "successful student" as an important input in trying to understand the complexity of distance learners who are working students, among other characteristics. Since students are the main clients in the instruction component of any university, it is important that their concept of student success be given importance as this can lead to adjustments on teaching and assessment practices to better serve their (academic) needs.

It is in this light that the current study tackled the following research questions:

1. What are the students' and their family and friends' perceptions of academic success? Do students consider themselves successful based on their own definition of success?
2. What are the possible teaching and assessment practices in general education courses to better address the range of needs of distance education learners, based on their perception of academic success?

Objectives of the Study

The study aimed at determining teaching and assessment practices in a general education course to better address a range of distance education learners' needs based on a thematic analysis of their graded learning activity reports on students' perception of success submitted by 147 learners of a general education course offered by an open education institution.

More specifically, the study aimed to determine the following:

1. Distance education learners' image of a successful student and their assessment if they are successful;
2. Distance education learners' perception of their parents' and friends' definition of a successful student success, and on whether they are affected by such definition; and
3. Teaching and assessment practices to better address distance education learners' needs based on their perception of student success.

Literature Review

A review was undertaken to assess what the literature relevant to the study has covered regarding the distance learners' concept of success, role of family and friends in students' success, needs

of distance of learners' profile of an open education institution's student, their perception of academic success, and current teaching and assessment practices for distance learners.

Perceptions of Student Success

According to the Academic Senate of the California State University or ASCSU (2019), "student success" has become synonymous with acquiring a degree, especially a degree achieved in four years, but should not be the sole standard for student success. The ASCSU believes that the term "student success" should also include the experiences and learnings of the student with their mentors and with other students. Some measures they have are emotional development, ability to collaborate with people other than yourself, critical and creative thinking skills, self-discipline, organizational capacity, mastery of skills, career success or admission to further degree programs, among other things.

York and others (2015) conducted a review of the definition and measurement of the term" academic success" and concluded that the theoretically grounded definition of academic success constitutes six components, namely: academic achievement, satisfaction, acquisition of skills and competencies, persistence, attainment of learning objectives, and career success. The same researchers argue that they found incongruence in the literature between how academic success was defined and how it was measured. These findings suggest that despite reports that have advocated for more detailed views of the term (Kuh et al., 2006), the bulk of published research continues to measure academic success as academic achievement narrowly; more specifically, operationalized as grades and/or grade point average (GPA).

Meanwhile, a study conducted by Burger and Naude (2020) among South African students revealed that perceived academically successful students were associated with strong academic self-concepts, motivation, balance, and effective study behaviors. In contrast to the notion that adversity hampers academic success, the participants in the study emphasized resilience when faced with challenges and difficulties. The study highlighted the complexity of students' academic success and the importance of recognizing the nuanced nature of individuals' reactions to academic challenges.

Cuseo (2012) theorizes that the holistic aspect of student success is consistent with recent research and interest in such concepts as multiple intelligences (Gardner, 1999), emotional intelligence or EQ (1995), and spiritual intelligence (Zohar & Marshall, 2000). It is also consistent with the vast majority of college mission statements and institutional goals, which include many outcomes that are not strictly academic or cognitive in nature (Astin,1991; Kuh et al.,1987).

The implications of this holistic definition of student success for one very desirable student outcome—student retention—are underscored by research that repeatedly demonstrates that the vast majority (75-85%) of students who withdraw from college do so for reasons other than poor academic performance. In fact, most departing students are in good academic standing at the time of their departure (Noel, 1985; Tinto, 1993). More recently, these findings were reinforced by institutional research conducted at Indiana University, Bloomington, which launched a broad range of initiatives to enhance the quality of the first-year experience and improve student retention. One conclusion drawn after implementing these initiatives was that strict concentration on academic matters does not significantly impact student retention without equal concentration on non-academic elements of student life (Smith, 2003). Thus, student success may be best defined as a holistic phenomenon that embraces the multiple dimensions of personal development and the multiple goals of higher education.

Alfaifi and colleagues (2020) have found that most students they interviewed defined success in college as— achieving their study goals, passing all of their courses, graduating on time, and having diligence and persistence.

Gammon-Pitman and Ding (2021) interviewed two students (Kate and Dan) from their pool of engineering student participants and mentioned that achieving success is a continuous process wherein people learn from their failures and that success gets redefined as one achieves their goals and makes new goals. It was also noted that success varies in each individual, but society plays a big role on how people define success. It is recommended that a student-centered approach be implemented in the classroom highlighting the students' experiences, so that success would not just be limited to good grades.

Rea (1991) found that the top seven responses to the question, "What outcomes in this course would you accept as 'success'?" were "Receive a grade that represents my best effort," "Learn something new which I was not familiar with before," "Try my best even if I don't get the best grade," "Better understand the subject matter," "Gain practical knowledge I can apply in everyday life," "Find the subject interesting," and "Better understand other people." According to Rea (1991), the top response showed that students wanted more than a high grade; they wanted a high grade best representing their effort. It was recommended that teachers should adopt an intrinsic teaching method that would stimulate curiosity and present intellectual challenges for the students to ensure mastery of the subject matter.

Saltürk (2021) aimed to determine students' perception of academic achievement and how they perceive themselves in terms of academic achievement. He found that the students do not measure their achievement with grades alone but also address social, psychological, cognitive, and professional aspects. There was a need for social approval, meeting expectations, achieving goals, and doing their job well. Around 75.9% of the students were reported by Saltürk (2021) as not finding themselves academically successful. One of the reasons he presented was "grades obtained in certain courses or tests." For the participants in the study who were already above a certain success ranking in the national high school entrance exam, the competitive environment was said to be a factor affecting students' perception of achievement.

Role of Parents in Children's Academic Success

Meanwhile, the role of parental expectations in affecting children's academic progress has also received substantial attention from psychologists and sociologists over the past half-century.

Yamamoto and Holloway (2010) reported that, in general, parental expectations had been found to play a critical role in children's academic success. The same researchers state that students whose parents hold high expectations receive higher grades, achieve higher scores on standardized tests, and persist longer in school than those whose parents have relatively low expectations (Davis-Kean, 2005; Pearce, 2006; Vartanian et al., 2007). High parental expectations are also linked to student motivation to achieve in school, scholastic and social resilience, and aspirations to attend college (Hossler & Stage, 1992; Peng & Wright, 1994; Reynolds, 1998).

A study by Dechant (2011) on the influence of friendship on motivation and academic achievement at Fort Hays State University in the US has shown that friendship, along with motivation, can impact the cognitive development and academic achievement of students in varying ways. As a result of the increase in attention on student achievement and the positive outcomes that

result from academic success, knowing the influences of age, friendship quality, various aspects of friendship, and motivation on academic achievement can only serve to enhance student achievement outcomes, and therefore success in adulthood.

The literature cited above suggests different lenses of student success, from the learners themselves and the various concepts from their relations, that is, family and friends. Parents' role remains to be critical; thus, their involvement seems to be a factor in students' academic success because learners seem motivated to study harder; hence, it can be surmised that parents' perception of student success is important for the learner. The above studies also showed that various aspects of friendship could enhance student achievement.

Needs of Distance Education Learners

In a 2003 study by Sampson, he reported that seemingly, students were, on the whole, satisfied with the course materials, the choice of modules, assignment feedback, and the length of time given to complete assignments. Thus, according to the researcher, it seems fair that most students' needs were largely met. An area of significant concern, however, was that of student support. Although this is an issue that inherently involves a high degree of subjectivity, this would appear to be an area worthy of further investigation since it relates directly to students' needs, and it would appear that students' needs are not being met in this aspect. Furthermore, as Robinson (1995) states in her review of research literature regarding learner support, "multiple interacting factors (personal, environmental and course variables) are at work in determining learner success," although some "institutional interventions can assist if appropriately targeted."

A more recent study by Martin (2020) listed the top five reasons why distance learning did not meet the needs of learners, namely: (1) inequitable access to devices or the Internet, (2) lack of authenticity or purpose (3) too many platforms and tools, (4) focus on the completion of tasks and assignments over learning; and (5) lack of connection and collaboration. These findings suggest the need to reach out to students to ask about their concerns continuously and educators may need to act accordingly or address expressed concerns of students.

Open and Distance e-Learning

ODeL consists of three concepts or domains— open, distance and e-learning, each of which has its definition and origin.

Distance education is any form of organized teaching and learning where student and teacher are physically separated, and technology is used to bridge this physical and instructional gap.

On the other hand, open learning is a vision of an educational system accessible to every individual with minimal restrictions. It emphasizes the flexibility of the system to eradicate problems caused by barriers like age, geographical location, time constraints, and economic situation.

E-learning is commonly referred to as the intentional use of networked information and communication technology (ICT) in teaching and learning (Naidu, 2006).

ODeL draws from the features and affordances provided by open learning, DE, and e-learning— access and equity, resource sharing, learner-centeredness, flexibility, active learning, interactivity, ubiquity, and connectivity. Some of these features— like access and equity — are more in tune with open learning— others, like learner-centeredness, flexibility, and active learning— are shared

by the three domains. Ubiquity, interactivity, and connectivity are more e-learning contributions (Alfonso, 2014).

Bandalaria (2016) expounded on ODeL as a framework for lifelong learning stressing the 21st century skills: creativity and innovation, communication and collaboration, digital literacy, critical thinking, and problem-solving.

The needs of distance learners in the 90s seem to be generally the same over time. As Sampson (2003) reports, all learning requires a degree of motivation, self-discipline, and independence on behalf of the learner, but these aspects are arguably more pertinent in the case of distance learning, where the student is mainly self-directed and unsupervised, and expected to be more autonomous.

Profile of the students of the open education institution

A review of some studies published from 2014 to 2018 on the profile of the open education institution learners coming from different academic programs reveals that majority are single, female, belonging to the 16-35 age range, and with almost an equal ratio of full-time to part-time students. Details on the said surveys are shown below.

Among 2410 Associate in Arts Program students, Reyes (2018) reported that 53% of the enrolled students were full-time and unemployed, while 44% are employed in their respective fields. A vast majority (89%) are single, a few (10%) are married, and the rest are widowed or legally separated. Students of the AA programs are located in 65 areas in the Philippines, and five areas outside the Philippines (offshore).

Meanwhile, among nursing students, Roxas-Ridulme (2017) found that the majority (76%) of the students are single, while 24% are married. In addition, 61% of the students are located overseas (offshore), while 39% are in the Philippines.

In 2016, Suarez and Quimbo found that among 58 Bachelor of Arts and Media Studies students, a huge majority (88%) belonged to the 16-35 age bracket, with 58 years old as the age of the oldest student. In addition, majority (60%) are female and 40% male with more than half (58%) classified from freshman to sophomore.

Cruz et al. (2014) found that out of the 144 students from the Organic Agriculture course, most are second-degree seekers and are working in their professions. Half of the students are married, around half (45.1%) are single, and the rest are widowed or separated. According to the same research, they do not have enough time to go to school as they have families to raise and are living in faraway places.

Methodology

Research Design

The research focused on the participants' (students) viewpoint on student success and how they think their parents and friends perceive it. Data were obtained from the COMM10 (Critical Perspectives of Communication) student report, which were part of the course's Module 3 (Communication and Identity Construction) graded learning activity on frames of students' success.

Thematic Analysis (TA) was the chosen methodology to identify emerging themes on the students' concept of student success. TA is a widely known research method for identifying, analyzing, and reporting data patterns known as "themes" (Clarke & Braun, 2006). Given its flexible nature, it can also serve as a tool to surface an intricate amount of data. Based on the participants' images of a successful student, the researcher's experience as a distance learner teacher, and what the literature suggests, a list of teaching and assessment strategies were arrived at.

The source of the generated themes was based on the following specific questions provided to students:

Using the notion of student success, reflect on how you perceive this idea (of student success) and how you think others (family members and friends) perceive the same concept by responding to the following question prompts:

1. *What is your image of a successful student?*
2. *Do you consider yourself a successful student? Why or why not?*
3. *By observing and/or inferring, how do you think your parents and friends perceive student success?*
4. *How have their views affected or influenced yours?*

Participants' Background

The profile of students, namely: age, gender/sex, civil status, employment (on whether they are full-time or part-time students), and academic classification, were obtained from the profile Google survey form provided at the beginning of the semester.

Teaching and Assessment Practices

The relevant teaching and assessment practices included in the study were from the literature review, including the researcher's own experience as a faculty of an institution of higher learning for three decades already for general education and major courses on communication (undergraduate and graduate).

Data Analysis

Based on the themes generated, which were taken from the students' graded learning activity reports, means and percentages were computed. The same analysis was done on the profile of students to serve as a background on the participants of the study. There was no intention, however, to do statistical analysis on the participants' characteristics against the themes generated.

Ethical Considerations

The students' consent to use their responses on Module 3 graded learning activity was obtained through a Google survey. All data are stored in Google Drive hosted by the university email. The sharing settings of Google documents and sheets were restricted and only accessible to the researcher and her online student assistant. All data obtained from participation in the study were treated with the utmost confidentiality.

Results and Discussion

Participants' Background

Analysis of their profile reveals the following: The majority are aged 24 years and below (63%), female (63%), full-time students (56%), but 44% are part-time or are employed, and freshmen to sophomore classification (58%).

Table 1

Student Profile

Student Characteristics	N=147	%
Age		
Youngest	18	-
Eldest	47	-
Average	24.2	-
Students aged 24 years and below	93	63
Gender		
Male	54	37
Female	93	63
Civil status		
Married	11	7
Single	136	93
Employment		
None (full-time student)	83	56
Employed (part-time or full time)	64	44
Academic classification		
Freshman (Student No. 2020-xxxxx)	37	25
Sophomore (SN 2019-xxxxx)	48	33
Junior (SN 2018-xxxxx)	8	5
Senior (SN 2017-xxxxx)	8	5
Super seniors (SN 2016-xxxxx and older)	46	31

Distance Learners' Images of a Successful Student

A huge majority of the distance learners (70%) visualize a successful student as someone who can "combine academic and non-academic life well while manifesting the following traits: disciplined, great at time management, can apply what was learned in the classroom to real-life situations, an all-rounder, good character, and good social life." (Table 2)

To the learners, success is not limited to academic excellence but more focused on non-academic aspects interestingly described as "book and street smart," "all-rounder," "good character, "good social life," and "jack-of-all- trades." One's ability to apply what was learned in the classroom to real-life situations as an indicator of student success was also mentioned.

Table 2

Response to Survey Question: What is your image of a successful student?

Student responses	No. of responses	% of responses
1. Can balance or manage academics and non-academics/life, is disciplined and great at time management	38	26
2. Can apply what they've in the classroom into real life situations; is book and street smart	33	22
3. Is an all-rounder; a jack-of-all-trades (excels in academics, non-academic commitments, is of good character and has good social life, etc.)	31	21
4. Is self-motivated; is content with life; has their own purpose and drive	14	10
5. Is focused on and values growth, learning, and development	13	9
6. Excels academically (with Latin honors, graduated on time, has good grades etc.) in a prestigious university	9	6
7. Has good grades and good character	9	6
Total	147	100

Based on our synchronous discussion, while many of the students, especially the already working professionals, wish to do academically well in the class, they are not at all disappointed if they do not excel in consideration of the fact that either they are married, a solo parent, or straddling between work and school. Hence, to them, their ability to balance school and work is by itself a "success."

Only a few students equated a successful student to someone who is academically excellent, *"excels academically – has good grades, graduated on time, graduated with Latin honors."*

The results of the current study confirm what Saltürk (2021) had reported: students do not really measure their achievement with grades alone but also address social, psychological, cognitive, and professional aspects. There was a need for gaining social approval, meeting expectations, achieving goals, and doing their job well.

In view of the above, there may be a need to review the assessment tools given to students for them to earn a passing mark – aligned more with their application of the classroom concepts to real-life situations or in synch with life after the university; and the guidelines governing the submission of these requirements be more receptive of their status as students (full-time or part-time; with children or solo parents). On this, I would like to stress the importance of giving immediate feedback on students' work. Some of my former students in the open education institution have shared that some of their professors seldom return their reports with comments or areas for improvement. They receive their final grades at the end of the semester (sometimes delayed by a semester or two).

As early as 2007, Hattie and Timperley have already reported that giving feedback is an essential skill for lecturers in higher education, and it has a major influence on the quality of the students' learning process. Consistent with this finding, Bashir and others (2016) similarly found that

"feedback is important in improving learning experience for the students and has a significant effect in professionalizing teaching in the higher education level."

In the context of distance learners and with the advent of digital technology, the literature suggests many ways such feedback can be had. Bashir and others (2016) mentioned two e-feedback mechanisms: (1) email: a simple but effective way of providing students the feedback; and (2) audio feedback. Recently, that has been exploited in providing feedback to students. It is widely known as a podcast in the academic arena.

For my classes, I used private chat messages through Google Classroom or MyPortal and/or group site postings of summarized general feedback. If I do not still receive feedback from the students, I search them on social media, e.g., Facebook messenger chats, although the use of social media has been strongly discouraged by the institution of higher learning that I am a part of.

Self-assessment on Being a Successful Student

Almost half (49%) of the students said they do not consider themselves successful students, while 41% said they feel they are successful as students.

Table 3

Response to Survey Question: Have you fulfilled your own definition of a successful student? Why or why not?

Student responses	No. of responses	% of responses
1. Yes, I have fulfilled my definition of a successful student.	60	41
2. No, I have not fulfilled my definition of a successful student.	39	27
3. Not yet, but I could be better.	33	22
4. Yes and no (I have fulfilled some of my mentioned characteristics of a successful student, but there are some I still do not)	15	10
Total	147	100

Based on the above results, the majority (59%) of the students do not consider themselves as successful in the context of the majority of learners' image of a successful student as "can balance or manage academics and non-academics/life, is disciplined and great at time management; can apply what they have learned in the classroom into real -life situations" among other characteristics." The rest of the students were confident they were successful.

Based on Zoom/synchronous interaction/discussion, most students would consider themselves really successful after they are done with college or have graduated already. I noticed that while their concepts of a successful student are less on academic performance, even at the non-academic parameters they listed, they seem to be wary in categorically stating they are successful students.

Students' Perception of their Parents' View of Student Success

Based on the students' observation, the majority (68%) of their parents express that success is when a student excels academically (with Latin honors, graduated on time in a prestigious university, has good grades) in a "prestigious" university and gets a high paying job while the rest

observed that their parents define student success as one's ability to excel in both academic and non-academic commitments with the following manifested characteristics at the same time: *an all-rounder; a jack-of-all-trades, is of good character and has good social life; can apply what they've learned in the classroom into real-life situations; is disciplined and great at time management.*

Table 4

Response to Survey Question: By observing and inferring, how do you think your parents perceive student success?

Student responses	No. of responses	% of responses
1. Excels academically (with Latin honors, graduated on time in a prestigious university, has good grades, has a job)	82	56
2. Has a degree	17	12
3. Is an all-rounder; a jack-of-all-trades (excels in academics, non-academic commitments, is of good character and has good social life)	16	11
4. Has good personality, consistent character	11	7
5. Can apply what he/she has learned in the classroom into real life situations; is book and street smart	11	7
6. Focused on and values growth, learning, and development	6	4
7. Can balance or manage academics and non-academics/life, is disciplined and great at time management	4	3
Total	147	100

Meanwhile, only 11% of the students observed that their parents think a student is successful if they have a good personality, "consistent" character and are focused on growth, learning, and development values.

These results are consistent with the literature appearing elsewhere in this report. It is common knowledge that parents are usually focused on their children's academic performance and take great pride and joy when their children graduate with Latin honors.

Thus, in view of the above, it may be necessary for teachers to provide moral support to students and go the extra mile to help distance learners cope with the requirements as pressure from parents may cause them to be mentally unwell. This is in the context that it would be impossible for teachers in higher education to change the mindset of parents.

Students' Perception of their Friends' View of Student Success

Based on the learner's impression, the majority (68%) of their friends perceive student success as someone who is "*an all-rounder, jack-of-all-trades, can combine well academic and non-academic initiatives, and can apply what was learned in the classroom in real life situation while enjoying good social life, disciplined, and self-motivated*" while only 22% view student success as excelling solely in academics. These results seem similar to the participants' concept of student success.

Table 5

Response to Survey Question: By observing and inferring, how do you think your friends perceive a successful student?

Student responses	No. of responses	% of responses
1. Excels academically (with Latin honors, graduated on time, has good grades etc.), in a prestigious university	33	22
2. Is an all-rounder; a jack-of-all-trades (excels in academics, non-academic commitments, is of good character and has good social life, etc.)	28	18
3. Can apply what he/she has learned in the classroom into real life situations; is book and street smart	24	16
4. Can balance or manage academics and non-academics/life, is disciplined and great at time management	22	15
5. Is self-motivated; is content with life; has their own purpose and drive; can take care of self	14	10
6. Has good personality, consistent character	13	9
7. Has a degree	7	5
8. No answer	7	5
Total	147	100

Studies have generally shown that friends' perceptions and peer pressure are real, and those learners are influenced heavily by their friends in many aspects of their lives. Comparing the learners' self-concept (70%) and their friends' concept (68%) of student success, one would say that the learners seem to be friends with individuals with whom they have similar perceptions in life.

However, teachers should take this as a challenge to encourage, inspire, and help their students to strike a good balance between school, work, and play.

Impact on Student of their Parents' and Friends' Views

Only 5% of the participants said they were unaffected by their parents' and friends' concept of student success. This means an overwhelming 95% of the students were either positively affected (65%): challenged/motivated/encouraged; or negatively affected (35%): crippled/pressured due to their parents' reliance on academic excellence as a measure of student success.

Table 6

Response to Survey Question: How have your (parents' and friends') views [of student success] affected or influenced your own view?

Student responses	No. of responses	% of responses
1. I was able to challenge, work for, and/or motivate myself.	60	41
2. I received encouragement from both parents and friends.	35	24
3. It induced crippling or overwhelming pressure.	32	22
4. I received pressure from parents and earned confidence and drive from friends.	12	8
5. Nothing; It did not affect or influence me.	6	5
Total	147	100

I think the descriptions of "crippled and overwhelmed" and how these would affect the students' mental wellness, especially amidst the pandemic, are quite alarming. In view of the above, it is clear that parents have a continuing influence on the lives of university students. In fact, a study by Harper and others (2012) revealed that parental involvement's effect on students is dependent on gender, race, class, and year in school.

Since the view of the participants and their friends on student success is almost similar, the former said that they were even more encouraged to strike a good balance between academic and non-academic accomplishments and/or focused more on "self-love." Such a result is similarly manifested in a study by Stewart and Maisonville (2019), which revealed that some scholars say that from the outside looking in, it may seem that successful students are good students simply because they are naturally good at studying. However, if you look closer, you will see that despite the students' differences, all successful students seem to share certain common traits. These characteristics include positive attitude, effective learning and thinking skills, time management skills, and personal well-being strategies.

Teaching and Assessment Practices for Distance Education Learners

In view of the analysis of the participants' responses and the presented teaching and assessment strategies for distance learners both, from the literature review and from the researcher's teaching experience, there really is a need to review the urgent expressions of distance learners on their current needs as manifested in their perception of student success. As York and others (2015) reported, they found incongruence in the literature between how academic success was defined and how it was measured, which may suggest the need for teachers to review the measuring tools or instruments used in gauging learning outcomes.

FICs may wish to reach out more to students, especially because the open education institution engages in distance learning; hence, minimal to no physical F2F engagement. Since asynchronous engagement can be had, FICs should provide more avenues of engagement, group work or peer evaluation to encourage socialization or interaction, respond to emails or portal chats as soon as possible – all these to help students strike a good balance between academic and non-academic achievements, their most popular definition of student success.

In my class, I conduct synchronous sessions to introduce every module's highlights for the following reasons: (1) to provide simplified discussions of the key concepts in the module, (2) to address or clarify whatever concerns the students have with respect to their understanding of the key concepts, (3) to present and discuss the graded learning and summative activities, (4) to respond to their clarifications regarding the graded activities, and (5) to conduct online breakout group activities to afford students some level of interaction. However, to be able to conduct one synchronous (via Zoom or Google Meet) session requires a lot of preparation on the part of the teacher.

Learning assessments can be made more authentic and practical as these should prepare the learner to use classroom knowledge at work or applied in daily life, especially because there are a good number of students in the open education institution who are working (either full-time or part-time) while studying. This would be consistent with the learners' concept of success as being able to practice theories learned in the classroom.

Saltürk (2021) found that the students do not measure their achievement with grades alone but also address social, psychological, cognitive, and professional aspects. There was a need for gaining social approval, meeting expectations, achieving goals, and doing their job well. This research data from Saltürk (2021) stress the need to consider using topics related to their daily, especially the GE course COMM 10 is on critical perspectives in communication; hence, the context of their graded activities can range from: what is their identity in social media compared to their identity at home; an analysis of pressing issues close to family, their immediate community or about the country and other relevant issues at hand.

A review of the students' profile based on the Google Survey and/or the data on the discussion forum on Self-Introduction can be studied first before graded learning activities, or summative activities are given to students. This way, the FIC can ensure that assessment activities are in the context of the students' nature of work or major field, consistent with their concept of work-based assessments. This will also ensure that the context of the graded activities is within the sphere of experience of the learners.

Learning assessments can be made more doable and within a realistic time frame to help students fulfill course requirements. Thus, assessments, for example, should not ask learners to go out of the house to interview people because that would expose them to the virus amidst the pandemic; if they should be asked to do group work, working online should strongly be encouraged. These assessments should be made more accessible, especially to those with both long-term and short-term disabilities or mental health issues. While officially approved channels for interaction include email and MyPortal chat, it may be an opportune time to review, allowing faculty members and students to engage in more popular social media channels. These recommendations are in sync with their concept of student success: great at time management, all-rounder, and good social life.

FICs can also study the possibility of providing choice or alternative graded activities per module for students (single or married learners, full-time or part-time students; hence, in different circumstances with varied experiences) to choose from – not one activity for all students per module or topic. While it would be more convenient for the FIC to just require one topic for the graded activity to make marking of papers easier and faster (because you will have one topic for all, and after a while, you will have mastered the key or answers), in the OdeL framework, there is an emphasis on creativity and innovation, as well as communication and collaboration.

It would be interesting to observe different communication concepts and perspectives based on the distance learners' varied profiles.

Modules/Topics of courses can be reexamined to assess if they can be streamlined for a more efficient and/or effective conduct of the course's learning outcomes, e.g., some modules can be combined because they are logically related or take an integrative approach to lesson planning. This would lead to fewer requirements easing both the workload of students and teachers alike, increasing the likelihood for students to engage in extra-curricular activities.

Conclusions

A huge majority of learners (70%) visualize a successful student as someone who can "combine academic and non-academic life well," while manifesting the following traits: "disciplined, great at time management, can apply what was learned in the classroom to real-life situations, an all-rounder, good character, and good social life."

Thus, from the students' descriptions, it is evident that success is not limited to academic excellence but is more focused on non-academic aspects interestingly described as "book and street smart," "all-rounder," "good character, "good social life," and "jack-of-all trades."

There may be a need to review the assessment tools given to students for them to earn a passing mark – aligned more with their application of the classroom concepts to real-life situations or in synch with life after the university; and the guidelines governing the submission of these requirements be more receptive of their status as students (full-time or part-time; with children or solo parents).

Based on the learners' image of a successful student, almost half (49%) consider themselves as not successful, while 41% consider themselves as successful.

Based on the students' observation, the majority (68%) of their parents expressed that success is when a student excels academically (with Latin honors, graduates on time) in a "prestigious" university and gets a high-paying job. Based on the learners' impression, the majority (68%) of their friends perceive student success as one's ability to combine academic and non-academic initiatives.

Almost all (95%) of the learners said that they were challenged or affected by the views of their parents and friends on student success and thus they decided to work harder.

This finding is consistent with the report of Yamamoto and Holloway (2010) when they said that, in general, parental expectations had been found to play a critical role in children's academic success.

In view of the analysis of the participants' responses and the presented teaching and assessment strategies for distance learners, both from the literature review and from the researcher's teaching experience, there really is a need to review the current and assessment tools used in the COMM 10 course by FICs to address the distance learners needs as implied in their perception of student success.

Recommendations

In view of the results of the study, the following are recommended:

1. FICs should provide more avenues of engagement to encourage socialization or interaction and should respond to emails or portal chats as soon as possible to help students strike a good balance between academic and non-academic achievements, their most popular definition of students' success;

2. Learning assessments can be made more practical as these should prepare the learner to use classroom knowledge at work or applied in their daily lives;

3. Learning assessments can be made more doable and within a realistic time frame to help students fulfill course requirements;

4. FICs can also study the possibility of providing more choices of graded activities per module for distance learners/students (single or married learners, full-time or part-time students, hence, in different circumstances with varied experiences) to choose from – not one activity for all students per module or topic; and

5. Module topics can be reexamined to assess if they can be streamlined for a more efficient and/or effective conduct of the course's learning outcomes.

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Change in Students' Welfare during the COVID-19 Pandemic and the Shift to Remote Learning: The Case of BA in Business Economics Students at a State University Unit in Pampanga

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Abstract

The COVID-19 pandemic has forced schools in the Philippines and abroad to shift to remote learning even without ample preparation. This unwanted scenario begged two questions. Firstly, has the welfare of students changed for the worse due to the COVID-19 pandemic and the shift to remote learning? And secondly, is the shift to remote or flexible learning as ordered by the state university and the CHED sound? To address these questions, the study determined whether the consumer surplus as a welfare indicator of 25 Business Economics students at a state university unit in Pampanga has significantly changed during the COVID-19 pandemic and the shift to remote learning. The students were chosen through purposive sampling. They belong to a block that has experienced a semester each of face-to-face and remote classes under the same professor in academic years 2019-2020 and 2020-2021. The quantitative and qualitative data needed for the study were obtained through an online survey. The result of the paired samples t-test showed that the mean difference of Php 8,380.00 between the students' consumer surplus during the pre-COVID-19 pandemic face-to-face modality and their consumer surplus during the COVID-19 pandemic and the shift to remote learning was not significant, with a standard deviation of 20,964.39442, confidence interval of 95%, t (24) = 1.999, and p = 0.057. This result suggests that: (1) the welfare of the 25 BA in Business Economics students, as indicated by their consumer surplus, has not significantly changed when the learning modality has shifted from face-to-face to remote during the COVID-19 pandemic; and (2) the shift to remote or flexible learning as ordered by the state university's Memorandum No. OVPAA 2020-31 dated 09 March 2020 and the CHED Memorandum Order No. 4 Series of 2020 was sound.

Keywords: *students' welfare, consumer surplus, COVID-19 pandemic, remote learning*

Introduction

On 30 January 2020, the Department of Health (DOH) reported the first Coronavirus Disease 2019 (COVID-19) case in the Philippines. COVID-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV2), a new strain of virus first detected in Wuhan, China, in 2019. On 07 March 2020, the DOH confirmed the first local transmission of COVID-19 in the Philippines. On the following day (08 March 2020), Proclamation No. 922 placed the entire country under a state of public health emergency. Subsequently, a memorandum from the Office of the Executive Secretary initially put the whole of Luzon under enhanced community quarantine for the period 17 March-13 April 2020 (National Economic and Development Authority Regional Office 3).

The COVID-19 outbreak has prompted all constituent units of the state university system to shift to the remote learning modality. Memorandum No. OVPAA 2020-31, dated 09 March 2020, mandated all faculty members and lecturers to adjust their pedagogy and assessment of existing classes even if they were designed in the traditional lecture or face-to-face mode. Memorandum No. OVPAA 2020-68, meanwhile, required all faculty members and lecturers at the state university to upload course packs in their chosen learning management system (LMS) before the start of classes in the First Semester of Academic Year 2020-2021.

COVID-19 necessitated a shift in pedagogical approach not only among the constituent units of the state university system but also in all public and private learning institutions. Commission on Higher Education (CHED) Memorandum Order No. 04 Series of 2020, for instance, ordered the adoption of flexible learning beginning in the Academic Year 2020-2021. This CHED memorandum defines flexible learning as a learner-centered approach anchored in the needs of the students. Its primary objective is "to provide learners with the most flexibility on the learning content, schedules, access, and innovative assessment, making use of digital and non-digital tools" (CHED, 2020, p. 3).

The shift to remote, distance, or flexible learning was not well received by stakeholders in the education sector. Although educators provided support, the COVID-19 pandemic exacerbated existing inequalities (Hamilton et al., 2020). One indicator of inequality is access to the internet. Many students do not have internet access at home, and household wealth is the most significant determinant of home internet access (Hereward et al., 2020).

Other indicators of inequality or challenges that hindered the ability of students to learn successfully during the COVID-19 pandemic and the shift to remote learning include: (1) unstable internet connection; (2) poor state of mental health; (3) inadequate personal ability; (4) poor time management; (5) being easily distracted; (6) family members making studying difficult; and (7) lack of interaction between students and teachers (Jopillo, 2020; Ojo et al., 2021).

Aside from giving rise to inequalities and challenges, the COVID-19 pandemic and the shift to remote learning have also resulted in students' intellectual dishonesty. A year of remote learning has led to cheating among students from grade school to college. Students have opportunities to cheat because they are mostly isolated at home and have various online services at their disposal (Kamalov et al., 2021; The Wall Street Journal, 2021). Cheating in online examinations, however, was discovered more than a decade earlier than the COVID-19-induced shift to remote learning (Wayne et al., 2009).

The literature cited in the preceding paragraphs begs two research questions. Firstly, has the welfare of students changed for the worse due to the COVID-19 pandemic and the shift to remote learning? And secondly, is the shift to remote or flexible learning as ordered by the state university and the CHED sound? To answer these questions, this study determined whether the consumer surplus as a welfare indicator of 25 BA in Business Economics students at a state university unit in Pampanga has changed significantly during the COVID-19 pandemic and the shift to remote learning.

In the context of this paper, welfare means well-being. Consumer welfare, on the other hand, means the well-being of consumers. Pindyck and Rubinfeld (2005) alternatively define it as the benefit or gain of consumers. To analyze whether there was indeed a change in the welfare of Business Economics students at the state university unit in Pampanga during the COVID-19 pandemic and the shift to remote learning, the microeconomic theory or concept of consumer surplus was used as the study's framework.

Consumer surplus is the difference between what a consumer is willing to pay for a good and how much they actually pay. It measures how much better off individuals are, in the aggregate, because they can buy goods in the market. It is measured graphically by the area under the demand curve and above the price line. Consumer surplus has important applications in economics. "When

added over many individuals, it measures the aggregate benefit that consumers obtain from buying goods in the market" (Pindyck & Rubinfeld, 2005, pp. 128–130).

In economics, consumer surplus is an indicator of consumer welfare and is alternatively defined as the excess social valuation of a product over the price actually paid (Khemani & Shapiro,1993). It should be emphasized that consumer surplus measures the accumulated gain that consumers receive for buying a good at a price lower than their maximum willingness to pay and not the individual gain (Consumer surplus, n.d.).

Consumer surplus is a monetary measure of the difference between what an individual pays for consuming a good or service and the amount he is willing to pay, given his income and the prices he faces. It is basically the net monetary benefit he receives from consuming the good or service. Hence, policies that change his income or the price he faces can change the amount of net benefit he receives from consumption and his monetary valuation of that benefit (Camm, 1983).

It can be deduced from the definition mentioned above that the determinants of consumer surplus are willingness to pay, prices, and income. However, in the case where only a single commodity price is stabilized, the consumer's preference for price instability depends upon four parameters: the income elasticity of demand for the commodity, the price elasticity of demand, the share of the budget spent on the commodity, and the coefficient of relative risk aversion (Shalit et al.,1980).

Time and again, changes in producer and consumer surplus have been used in evaluating the welfare effects of government intervention in the market, such as the implementation of price controls (Pindyck & Rubinfeld, 2005). At the World Bank, measuring consumer surplus is an increasingly popular approach to quantifying the monetary benefits of energy projects (Peskin, 2006).

Consumer surplus has also been used as a framework in analyzing welfare changes brought about by digital goods. One study found that a median user needed a compensation of about $48 to forgo Facebook for one month, and that digital goods have created large gains in well-being that are not reflected in conventional measures of GDP and productivity (Brynjolfsson et al., 2019).

Consumer surplus was also found helpful in the field of education, such as in the investigation of the educational choice anomaly. According to the educational choice anomaly, providing education for free can result in less of it being chosen (e.g., an increase in the number of dropouts) and a lower level of educational quality purchased (Graves et al., 2011). This emphasizes that education, especially higher education, is partly consumption – done for its own sake – and partly investment. At least for postsecondary education, the opportunity cost of a person's education is also forgone wages while acquiring the education. Education spending should consider the direct and opportunity costs of education (Blanchard, 2003).

In this study, consumer surplus was used as an indicator of the welfare of 25 Business Economics students at a state university unit in Pampanga, Philippines. If the mean difference between the consumer surplus of the students during the pre-COVID-19 face-to-face modality and their consumer surplus during the COVID-19 pandemic and the shift to remote learning was significant, then, it would imply that there was indeed a change in their welfare because of the said pandemic and shift in the learning modality.

Methodology

This study used a quantitative research approach and a survey research design. The unit of analysis was the individual BA in Business Economics student at the state university unit in Pampanga who belongs to a block of 25 students who had experienced a semester each of both the face-to-face and remote classes under the same faculty member in Academic Years 2019-2020 and 2020-2021. These students were chosen by the Student Credit Evaluator through purposive sampling. They were all beneficiaries of free tuition under Republic Act No. 10931 or the Universal Access to Quality Tertiary Education Act of 2017, and as indicated in the student profile of the Computerized Registration System (CRS), they have access to computers and/or mobile phones and the internet. Hence, they have closely similar socio-economic profiles. Their identities have been kept anonymous by the academic unit's Student Credit Evaluator, who was also requested to conduct the online survey.

The Business Economics students were asked whether they would agree to be respondents to an online survey on consumer surplus as an indicator of both their welfare during the pre-COVID-19 pandemic face-to-face modality and their welfare during the COVID-19 pandemic and the shift to remote learning. All of them agreed and gave their consent by answering the first item in the online survey form. As an additional ethical consideration, the actual or specific name of the state university unit in Pampanga was also kept anonymous throughout the paper.

In the online survey form, the students were asked to indicate the amount (in Philippine pesos) in a semester that they: (1) were willing to pay for face-to-face classes; (2) actually paid for face-to-face classes; (3) were willing to pay for remote classes; and (4) actually paid for remote classes. It should be noted that aside from tuition and other school fees, their responses included the amounts they were willing to pay and actually paid for food, transportation, housing, and internet. The difference between (1) and (2) was the consumer surplus of students during the pre-COVID-19 face-to-face classes, while the difference between (3) and (4) was the consumers surplus of students during the COVID-19 pandemic and the shift to remote learning. A paired samples t-test was subsequently performed to determine whether the mean difference between the consumer surplus during the face-to-face modality and the consumer surplus during the COVID-19 pandemic and the shift to remote learning was significant.

Using the same online survey form, the students were also asked to rate their satisfaction with the face-to-face and remote classes using the following Likert scale: 5 = very satisfied; 4 = satisfied; 3 = indifferent; 2 = dissatisfied; and 1 = very dissatisfied. A paired samples t-test was also performed to determine whether the mean difference in the students' satisfaction ratings for the face-to-face and remote classes was significant. The students were also asked to give their reasons for such ratings.

Ethical Considerations

As ethical considerations, the author has: (1) gotten the consent of the students/respondents through the academic unit's Student Credit Evaluator and by answering the first item in the online survey form/questionnaire; (2) kept the identities of the students/respondents anonymous; (3) kept the actual or specific name of the state university unit in Pampanga anonymous; and (4) changed the paper's title to "Change in students' welfare during the COVID-19 pandemic and the shift to remote learning: the case of BA in Business Economics students at a state university unit in Pampanga."

Results and Discussion

The students were willing to pay as much as Php 49,040.00 in a semester for face-to-face classes but actually paid only Php 27,840.00. The mean difference of Php 22,040.00 was significant at 95% confidence interval, with a standard deviation of 18,318.31961, t (24) = 6.016, and p = 0.000.

The students, meanwhile, were willing to pay as much as Php 44,020.00 in a semester for remote classes but actually paid only Php 30,360.00. The mean difference of Php 13,660.00 was significant at 95% confidence interval, with a standard deviation of 15,922.15438, t (24) = 4.290, and p = 0.000.

The mean differences between what the students were willing to pay and actually paid for face-to-face and remote classes were significant because they were all a part of the 1,600,000 students who are beneficiaries of free tuition and other school fees under the Universal Access to Quality Tertiary Education Act of 2017, otherwise known as Republic Act No. 10931 (Rocamora, 2021). The amount they actually paid both for face-to-face and remote classes would have been much higher if not for the implementation of the said law.

The above finding gives an initial impression that the mean difference between the students' consumer surplus during the pre-COVID-19 face-to-face classes and their consumer surplus during the COVID-19 pandemic and the shift to remote classes was also significant. The result of the paired samples t-test, however, showed the contrary. The students' consumer surplus during their face-to-face classes was Php 58,600.00 but their consumer surplus during the COVID-19 pandemic and their remote classes was negative Php 2,520.00. However, the mean difference of Php 8,380.00 between these consumer surpluses was not significant at a 95% confidence interval, with a standard deviation of 20,964.39442, t (24) = 1.999, and p = 0.057. This implies that the change in the students' welfare between the two periods and teaching modalities was also insignificant.

The insignificance of the mean difference mentioned above may be attributed partly to the high confidence interval of 95%. If the confidence interval had been a bit lower, say 90%, the mean difference between the two consumer surpluses could have been significant with p = 0.050 instead of p = 0.057. The insignificance may also be attributed to the higher inflation rate during the COVID-19 pandemic. In April 2020, or a month after the first imposition of the Enhanced Community Quarantine (ECQ) in Luzon, the country's inflation rate was 2.2%. In Central Luzon, the inflation rate for the same period was higher at 2.6% (Philippine Statistics Authority, 2020). If the inflation rate had been lower than the said figures, the mean difference of Php 8,380.00 between the two consumer surpluses could have been significant. In other words, the mean difference of Php 8,380.00 could have been more valuable in the eyes of the students if not for the higher inflation rate during the ECQ period.

Meanwhile, the mean difference of 1.52 between the students' satisfaction rating in face-to-face classes and their satisfaction rating on remote classes was significant at a 95% confidence interval, with a standard deviation of 1.00499, t (24) = 7.562, p = 0.000. It can be noted that the mean rating of students for remote classes was only 3.000 or indifferent at worst, while for face-to-face classes it was 4.520 or almost very satisfied at best.

The BA in Business Economics students at the state university unit in Pampanga who served as this study's survey respondents were indifferent to the remote modality of classes primarily because of the unfavorable learning environment. Most of them did not have a quiet place to

study in. Very often, they would be interrupted by their parents for some errands. One of the students explained: "*On the one hand, remote classes enabled me to stay at home and escape the long commute from Bulacan to Pampanga. But on the other hand, I felt disadvantaged due to our poor internet connection. I also could not concentrate on my classes because my mother would always ask me to do the house chores and take care of my baby brother.*"

Another reason for their indifference to remote classes was the lack of interaction between them, their teachers, and their fellow students. Due to the limited time of remote classes, they could not ask their teachers the questions they would typically ask during face-to-face classes. They could not clarify concepts that were not very clear to them. They were also demotivated to attend remote classes because they could not physically interact with their friends and fellow students. These are understood clearly from this student's complaint: "*It is very difficult to study subjects like accounting or economics in a remote setup. I could not ask my professors for more example computations or additional graphical illustrations. It is also sad because my block mates are not there to compare notes with.*"

A third reason given by the students for their indifference to remote classes was their unstable internet connection. They could not attend remote classes whenever their internet connection was down. Due to poor internet connection and limited data, they were forced to turn off their camera. This, in turn, resulted in further loss of interaction with their teachers and classmates. Those who could afford it were able to shift to a more reliable internet provider, but most of them had to stick to their old internet provider due to lack of funds.

With the shift to remote classes, some students felt that their course requirements had become more voluminous. Some of their teachers had given them more homework such as exercises or readings to compensate for the shortened classes under remote mode.

Finally, the students were indifferent to remote classes because they felt their lessons were not being discussed thoroughly by their teachers. Some topics that used to be discussed when classes were face-to-face had been skipped. One of the students said: "*When our classes were still face-to-face, Professor GD would always have several cases of market failure such as those brought about by negative externalities or monopoly power. But when our classes became remote, he stopped giving us those cases.*"

In summary, the reasons given by the students for their indifference to remote classes were the following: (1) unfavorable learning environment; (2) lack of interaction between students and teachers, and among students; (3) unstable internet connection; (4) voluminous course requirements; and (5) lessons not being discussed thoroughly. This finding confirms the observations of Hereward et al. (2020), Jopillo (2020), and Ojo et al. (2021).

The results of the paired samples t-test for the students' willingness to pay, actual cost, consumer surplus, and satisfaction rating for face-to-face and remote classes are summarized in Table 1.

Table 1

Results of Paired Samples T-Test of Students' Willingness to Pay, Actual Cost, Consumer Surplus, and Satisfaction Rating for Face-to-Face and Remote Classes

Pair	Mean Difference	Standard Deviation	t (24)	p	Mean Difference Significant at 95% CI?
W2P F2F – W2P Remote	22,040.00	18,318.31961	6.016	0.000	Yes
Cost F2F – Cost Remote	13,660.00	15,922.15438	4.290	0.000	Yes
CS F2F – CS Remote	8,380.00	20,964.39442	1.999	0.057	No
Satisfaction Rating F2F – Satisfaction Rating Remote	1.52	1.00499	7.562	0.000	Yes

Conclusion and Recommendations

This study concludes that the welfare of 25 BA in Business Economics students of the state university unit in Pampanga, as indicated by their consumer surplus, has not significantly changed when the modality of learning had shifted from face-to-face to remote during the COVID-19 pandemic. At a 95% confidence interval, the mean difference between the students' consumer surplus during the pre-COVID-19 face-to-face classes and their consumer surplus during the COVID-19 pandemic and the shift to remote learning was found to be insignificant.

The result of the study lends support to Memorandum No. OVPAA 2020-31 dated 09 March 2020 that mandated all constituent units of the state university system to shift to remote learning following the global outbreak of COVID-19. It also supports the CHED Memorandum Order No. 04 Series of 2020, ordering the adoption of flexible learning by all public and private higher learning institutions in the country. In short, the government does not have to fear that the shift to remote or flexible learning modalities would lead to the students' welfare loss. The mandated shift to remote or flexible learning was indeed sound.

To address the indifference of students to remote classes, the study recommends the following: (1) parents, teachers, school officials, alumni, and the government should work hand in hand to provide students with a favorable learning environment, such as a quiet room with stable internet connection and dependable laptop computer; (2) teachers should conduct their remote classes in such a way that there will be more interactions between them and their students, and among their students, such as encouraging class participation during synchronous classes and having more recitations and group presentations; (3) parents should strive to upgrade their children's internet connection— preferably with higher megabits per second; (4) teachers should trim down their syllabi and course requirements so that only the essentials are required; and (5) teachers should thoroughly discuss the topics included in their syllabi and ensure that the concepts being discussed have enough examples, illustrations, or applications.

In addition, since cheating has become rampant since the COVID-19 pandemic and the shift to remote learning (as reported by Kamalov et al., 2021; The Wall Street Journal, 2021), teachers and school officials should consider online proctored examinations and invest in a software that checks for plagiarism and similar acts of intellectual dishonesty. The COVID-19 pandemic and

the shift to remote learning should not become an excuse for producing dishonest or mediocre graduates. After all, honor and excellence are the virtues that the state university tries to instill to its students.

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Developing Positive Climate and Behavior Management in a Flipped Classroom

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Abstract

This study aimed to examine the positive climate and behavior management aspects of the flipped classroom environment in a Grade 7 science class. Further, it determined the factors that contribute to the establishment of a positive learning classroom environment and management of student behavior in a flipped classroom. The students' asynchronous pre-class activities included a science courseware developed by the Department of Science and Technology. Meanwhile, the synchronous face-to-face activities involved performing individual and group activities and answering concept questions through peer instruction. The classroom environment was described using the Classroom Assessment Scoring System. The scores obtained during the classroom observation were triangulated using the students' and teacher's daily journal entries, and student focus group discussions held at the end of the implementation. Findings showed that the flipped classroom experienced difficulty in establishing a positive climate and facilitating behavior management on the first few days of implementation. However, the scores in positive climate and behavior management gradually increased as the implementation of the flipped classroom progressed. It is worth noting that the flipped classroom exhibited high range scores in the following areas of positive climate – positive affect, relationship, and positive communication; and middle range score for respect. Towards the end of the implementation of the flipped classroom, middle range scores were obtained in the following areas of behavior management – clear behavior expectation, proactive, redirection of misbehavior, and student behavior. Based on the findings, this study discussed the ways of overcoming the challenges in developing a positive climate and behavior management.

Keywords: *flipped classroom, positive climate, behavior management*

Introduction

After two years of emergency remote teaching and learning, schools in the Philippines are now reopening and have started offering courses in blended modalities. Blended classes were not commonly offered prior to the pandemic thus it challenged teachers, students, curriculum developers, and administrators to explore new teaching and learning paradigms that take advantage of technology and independent learning.

Flipped classroom is a blended learning model that combines face-to-face classes, and synchronous and asynchronous remote learning. In a flipped classroom, students get exposure to instructional content using readings, videos, or both outside the class. The class time is used for assimilating knowledge through active learning activities. This learning modality is an emerging trend in science education as it blends technology into the daily learning activities of students.

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It addresses the need to integrate technology in the classroom, develops metacognition among learners, and provides students with cognitive activities during class hours (Jensen et al., 2015). In a flipped classroom, students have time to assess their own understanding and monitor their own thinking through metacognition. More time inside the classroom is devoted to cognitive activities which lead to mastery. In this approach, students gain knowledge and comprehension outside the class and are expected to apply, analyze, synthesize, and evaluate those concepts inside the class (Sarawagi, 2013).

Bergmann and Sams (2012) pointed out that flipped learning is about the use of the in-class time with students in the best way possible. Shih and Tsai (2017) suggested that the teacher implementing flipped classrooms should constantly examine the effectiveness of self-study, be creative in designing classroom activities, and incorporate social learning during in-class activities. Teachers implementing a flipped classroom who fail to plan for engaging active learning activities will not achieve a significant increase in student engagement and achievement (Findlay-Thompson & Mombourquette, 2014; Waddell, 2012). Therefore, proper preparation of active learning activities is the key to the success of flipped classrooms.

Flipped classrooms are at their best when structured with active learning activities (Baepler et al., 2014; Jensen et al., 2015). This study used peer instruction as the active learning activity. In implementing peer instruction in class, students are free to discuss their answers to conceptual exercises and problems (Crouch & Mazur, 2001). Active learners participate in class by questioning, giving answers, and expressing opinions among peers and instructors (Abdullah et al., 2012). Peer instruction not only asserts student ownership of his learning, but also creates a conducive learning environment.

One advantage of peer instruction in promoting active engagement in class is the immediate feedback on student understanding. Different ways of polling systems can be utilized during peer instruction such as show of hands, flashcards, digital scanning forms, Personal Response System (PRS) and other similar technologies.

The Plickers application used in this study is a hybrid of flashcards, scanning form, and classroom network. The students used the printed Plicker cards which contained the responses for the concept test. The camera phone of the teacher scanned the cards, and the Plickers application installed in the teacher's device recorded the answers of the students and generated percentages of the students who chose each response. The design of the implementation of the flipped classroom with peer instruction (FCPI) in this study is low cost and can be utilized even with minimal resources. This application works efficiently even in gadgets with low specifications.

One of the challenges in technology integration in classrooms involves the readiness of teachers. Not all teachers are 'digital natives.' Many would be hesitant to incorporate technology in a flipped class especially with the reported challenges like the "unsettledness" of students in the flipped classroom, the new role of the teacher, technology dependency, and source of pre-class activities, among others (See & Corny, 2014; Strayer, 2007). However, due to the circumstances, teachers need to learn the management skills and preparations to incorporate technology in class. This study on FCPI is a significant endeavor in promoting technological teaching pedagogy which will allow teachers to maximize the benefits of flipped classrooms and avoid falling into its pitfalls.

The FCPI strategy explored in this study is expected to deliver positive outcome in positive climate and behavior management by promoting learning at the rate and pace of the learner and not of

the teacher, and valuable use of class time as students come to class prepared and ready for active learning activities. Flipped classrooms are highly individualized in nature while peer instruction promotes collaboration. The initial information transferred through individual study in the flipped setting is highly sought for in the peer instruction setting. It is expected that in a flipped classroom and peer instruction approach, the Filipino science classroom will be transformed into a true 21st century classroom where quality learning happens.

Objectives

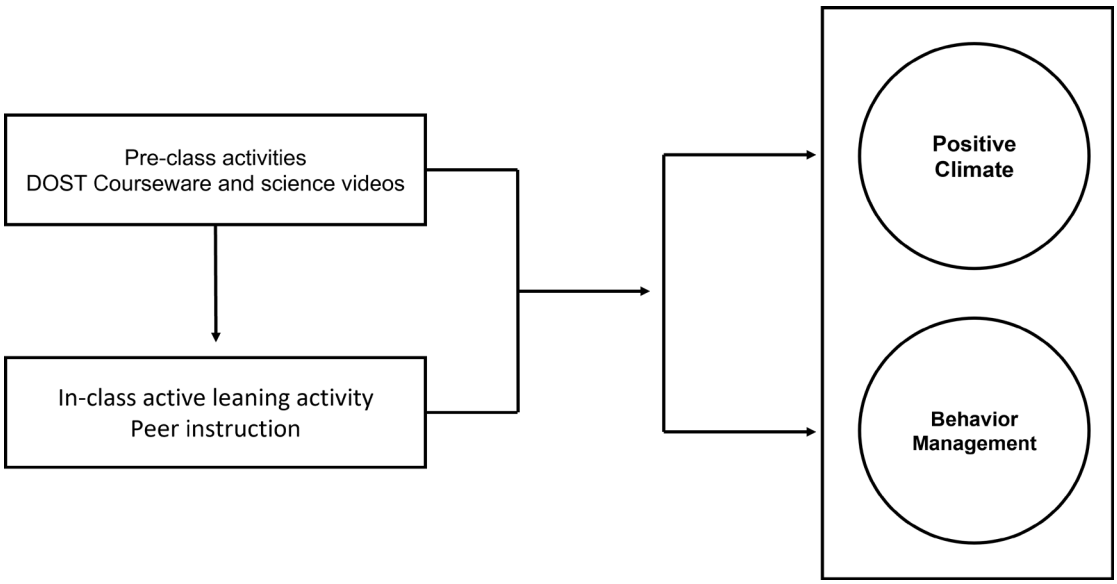
The study aimed to analyze how FCPI facilitates the creation of a positive climate and behavior management in the classroom. Specifically, the study was done to: (a) determine the factors that contribute to the establishment of a positive learning classroom environment; and (b) analyze the factors that are crucial to managing students' classroom behavior in a flipped classroom set-up.

Conceptual Framework

Figure 1 shows that the use of the flipped classroom with peer instruction requires individual/ independent learning before class and interaction with the teacher and peers during class. The flipped classroom is an attempt to end the teacher-centered model of teaching. A shift from direct instruction to individual learning provides more classroom time for collaboration, coaching, content analyses, and receiving feedback. Flipped learning as a pedagogical approach makes the group learning space more dynamic and interactive. This was done by giving students direct instruction in their individual learning spaces.

Figure 1

The conceptual framework



Flipped classrooms have made it possible for students to come to school prepared (Herreid & Schiller, 2013). More learning happens inside the classroom when the teacher and, most importantly, the students come prepared. Asynchronous studying of learning materials as homework makes students ready for class and engaged for higher-order learning. When they are prepared, they are more enthusiastic in classroom activities and are more confident to help one another.

Peer instruction improves the feedback system in class (Buchart et al., 2009). With real-time feedback in a face-to-face class, the teacher can adjust accordingly his instruction to the level of the students. It also increases student-student interaction and ensures active engagement and a cooperative atmosphere in class since they are expected to discuss with peers. Peer instruction polling that keeps the anonymity of students encourages participation, especially for shy students, and breaks the monotony of the traditional lecture through concept tests and discussions. This study verifies the possible effects of flipped classrooms with peer instruction on the classroom environment specifically on positive climate and behavior management.

Methodology

Context of the Flipped Classroom

The study utilized a one-group quasi-experimental research design. It was conducted in an integrated national high school in the municipality of Sta. Cruz, Laguna, Philippines. Permission to conduct the study, and parent and student consent were sought. Sta. Cruz is a first-class municipality and the provincial capital of Laguna. The school is government-owned and follows the residential mode of content delivery.

The study was conducted during the first quarter of the School Year 2019-2020. It involved 47 Grade 7 Junior High School students enrolled in Science 7. Overall, there were nine (9) lessons included in the study:

Lesson 1 - Pure substances and mixtures
Lesson 2 - Evaporation
Lesson 3 - Elements and compounds
Lesson 4 - The periodic table of elements and symbols of elements and compounds
Lesson 5 - Subatomic particles
Lesson 6 - Acids and bases in matter
Lesson 7 - Acid and base indicator
Lesson 8 - Metals and nonmetals
Lesson 9 - Difference between observation and inference

Unlike the conventional classroom, the students in the flipped classroom were introduced to the content of the lesson before the class. The Department of Science and Technology (DOST) science courseware for Grade 7 served as the main source of pre-class assignments in the FCPI. The conceptualization, development, and production of the courseware which was launched in December 2014 was a joint effort of the DOST-Science Education Institute (SEI), Advanced Science and Technology Institute (ASTI), Philippine Normal University (PNU), and University of the Philippines-National Institute for Science and Mathematics Education Development (UP NISMED). To access the science courseware, students logged in to the school's computer laboratory on a predetermined schedule.

During face-to-face interactions, the students applied, analyzed, and evaluated what they understood from the pre-class activity. The lessons were enriched with activities like worksheets with puzzles and illustrations, visual presentations, and printed copies of the periodic table to suit the visual type of learners. Meanwhile, boardworks and experiments were included to cater to the tactile learners; and lecture discussion, role play, and recitation were included for the auditory

type of learners. Learning activities during face-to-face class were conducted individually or by group. Slide decks and LCD projector were used in delivering instructions in class.

The study adapted the peer discussion process implemented at the University of Waterloo Centre for Teaching Excellence (2016), as follows:

> *Step 1:* A question was posted by the teacher.
> *Step 2:* The students individually answered the questions using Plickers™. The students raised their Plickers cards representing their answers. The teacher collected on-the-spot formative assessment data using her camera phone.
> *Step 3:* When all students have given their answers, the teacher showed the percentage of students who got the correct answer.
> *Step 4:* The students were prompted to discuss their answers with their partner.
> *Step 5:* After the peer discussion, the students revoted their answer.
> *Step 6:* The teacher gave the correct answer and the explanation.

The rest of the questions were answered and discussed following these steps. After class, the students wrote in their journals what they learned from the process.

Data Collection

Classroom observation

The classroom environment was observed for positive climate and behavior management using an instrument adopted from the Classroom Assessment Scoring System™ (CLASS™). This scoring system was developed and validated at the University of Virginia Curry, School of Education. Positive climate dimension is categorized under emotional support domain, while behavior management dimension is under classroom organization domain. Each domain covers several dimensions which were scored in a scale of 1–7. A score range of 1–2 is considered low, 3–5 as middle, and 6–7 as high (CLASS Implementation Guide, 2009). A fourth year BS Mathematics and Science Teaching (BS MST) student from the University of the Philippines Los Baños was invited to observe and score the class using the scoring system. He has taken four Field Study courses in his program which made him qualified to observe the different interactions in class. The observer was given a briefing about the nature, characteristics, and methods of carrying out flipped classroom and peer instruction. To ensure accuracy of the scores, the observer was also briefed about the scoring parameters. The scores were triangulated using the journal entry of the teacher and students, and through focus group discussion with selected students.

Journals

The students wrote journal entries after their science class. The journal was mainly focused on the experiences of the students in the science class, which include their insights about the lessons, learning activities, their classmates, and their teacher.

Meanwhile, the teacher-researcher also kept a daily teaching journal that served as a way of keeping track of notable events and difficulties and/or improvements occurring in each classroom set-up. The journals of both teacher and students were used to determine difficulties, progress, and effectiveness of the teaching methodologies used in this study.

Focus group discussion

A recorded focus group discussion (FGD) with students was conducted to describe their experiences in class, enumerate difficulties they encountered, and give suggestions on how to improve the implemented method of teaching. The FGD was participated in by 14 girls and 11 boys.

Results and Discussion

Positive climate

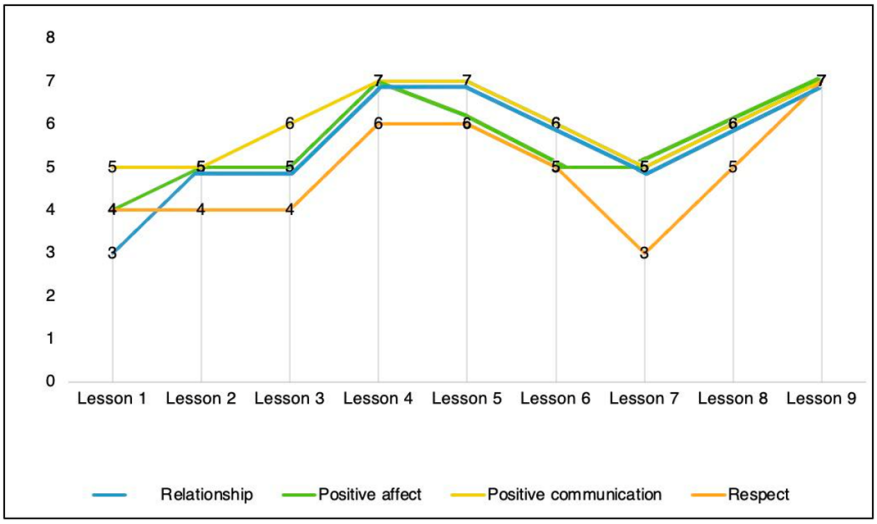
The factors contributing to a positive climate were relationships, positive affect, positive communication, and respect. Relationship between student and teacher was indicated by warm and supportive engagement with one another. Positive affect was seen in frequent smiling, laughter, and enthusiasm in class. Positive communication can be displayed physically or verbally between the students and the teacher. Respect is seen through eye contact, having a warm and calm voice, using respectful language and cooperation, and sharing between the students and the teacher.

Figure 2 presents the score graphs for positive climate dimensions. As indicated, the FCPI generally started at the middle range of relationship in the first three lessons.

> "*Medyo nahirapan si Mam sa class review dahil magulo kami.*" (Our teacher had difficulty conducting the class review because we are disorderly.) (n=2)
>
> "*Nangbu-bully ang katabi ko.*" (My seat mate is bullying me.) (n=2)
>
> "*Minsan ay hindi ako nakikinig kay Ma'am.*" (Sometimes I do not listen to our teacher.) (n=1)
>
> "*Makulit ako sa room.*" (I am playful inside the classroom.) (n=1)
>
> "*Di maintindihan ng classmate ko ang pinapagawa ni Ma'am.*" (My classmate does not understand the instructions of our teacher.) (n=5)

Figure 2

Positive climate as shown in classroom relationship, positive affect, positive communication, and respect



In the FCPI, the lowest score for relationship was observed in Lesson 1. On this day, the teacher reported in her journal that students were peeking at the window and wanted to go home already during the discussion. They seemed uninterested in the lesson because they already know the topic being discussed.

Consequently, this situation was also reflected in the positive affect dimension for the FCPI. The teacher needed to reprimand the students because of their behavior. Taking into consideration that the students were not yet familiar with the teacher and most especially with the new teaching strategy they were exposed to, the FCPI experienced difficulty establishing a positive climate until the fourth lesson. Relationships occurring in the flipped classroom, regardless of the method, predict the classroom environment (Hannah, 2013) and the success of the flipped method (McCollum et al., 2017). Some behaviors which conveyed care and developed rapport between students and teacher were responding to questions that communicate concern and interest, giving praise to student works or actions, and engaging in informal conversations (Barr, 2016).

On the other hand, positive affect was mostly at the middle range. Meanwhile, positive communication was observed mostly at the high range. This indicates frequent positive communications, whether verbal or physical, among teachers and students.

In the succeeding meetings in the FCPI, an improvement in the positive climate dimension was observed. The varied activities in FCPI allowed students to develop a warm relationship with the teacher and with co-learners. The highest scores were recorded more frequent positive communication as indicated by the positive entries in the student journal.

> *"Marunong makitungo ang mga classmates ko."* (My classmates know how to work with others.) (n=7)
> *"Nagtawanan kaming magkaklase."* (We laughed in class.) (n=5)
> *"Maganda ang pag-aaral ko kasama ng classmate."* (It is nice to study with my classmates.) (n=2)
> *"Me and my partner help each other get the correct answer."* (n=3)
> *"Nadagdagan ang pakikinig sa teacher para matuto."* (I listen more to my teacher to learn.) (n=13)
> *"Masayang magturo si Ma'am."* (Our teacher is a fun teacher.) (n=13)
> *"Natuto akong magpahalaga sa gawa ng iba."* (I learned to value the work of others.) (n=1)
> *"Class namin ang pinakamasaya."* (Our class is the most enjoyable.) (n=1)
> "I do my best in every science lesson." (n=1)

Respect, as the last factor contributing to positive climate, was observed to be mostly at middle range. The FCPI gained varying scores for respect which may be affected by outside factors like the nature of the activity and student behavior. The lowest and highest scores for respect gained in the FCPI were 3 and 7, respectively. On the day when the lowest score was observed, the teacher noted that the students got too excited during the demonstration of laboratory materials used in measuring pH.

Behavior management

Factors contributing to behavior management were clear behavior expectation, being proactive, redirection of misbehavior, and student behavior. Clear behavior expectation was regarded as

clarity and consistent enforcement of rules. Being proactive was observed as anticipation of problems to effectively prevent problems from developing. Redirection of misbehavior was described as effective reduction of misbehavior by focusing on positive behavior and making use of subtle cues. Effective re-direction of misbehavior did not take time away from learning. Meanwhile, student behavior was regarded as frequent compliance and little aggression and defiance of students. Figure 3 presents the graphs of the scores of FCPI for behavior management.

At the start of the class, teachers should communicate to their students the classroom or house rules so that students will be guided and know what behavior is expected of them in class (Turano, 2005). As presented in Figure 3, the teacher in the FCPI got low scores in setting clear behavior expectation on Lesson 1. This resulted in the display of negative behaviors in class evident in the student journal entries.

> *"May nangongopya."* (There are cheaters.) (n=3)
> *"Minsan nale-late ako sa klase."* (Sometimes, I am late in class.) (n=2)
> *"Minsan di ako umaattend sa klase."* (Sometimes, I do not attend class.) (n=2)
> *"Magulo at maingay ang iba kong classmates."* (Some of my classmates are disorderly and noisy. (n=14)
> *"Minsan sinasaway kami ni Ma'am."* (Sometimes, we are reprimanded by our teacher.) (n=3)

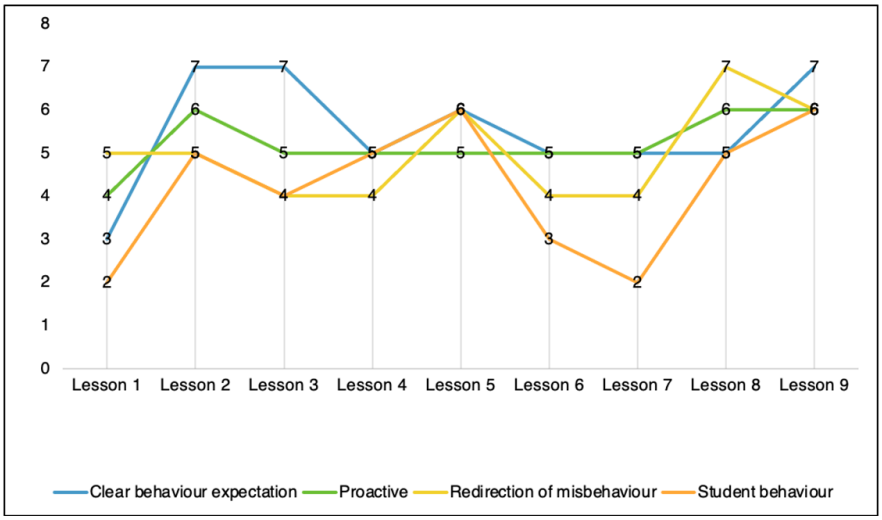
Nevertheless, on Lesson 2, the highest score of 7 for clear behavior expectation was obtained. This was marked in the teacher's journal when she was able to establish rapport with her students. The students were observed to be more cooperative and engaged in the group activity since the teacher had set her expectations of the students about pre-class activities and during class activities. The students wrote the following about the group activities in their journal:

> *"Masaya ako dahil lahat kami ay nakikicooperate."* (I am happy because everyone cooperated.) (n=22)
> *"Masaya ang group activity."* (Group activities are fun.) (n=22)

In the succeeding classes, clear behavior expectation was observed to reach middle to high range scores. This indicated that rules and expectations may be stated clearly but were inconsistently enforced in the classroom. The nature of the flipped classroom being activity-based allowed the teacher to set clear behavior expectation.

Figure 3

Behavior management as shown in clear behavior expectation, being proactive, redirection of misbehavior, and student behavior



The teacher in the classroom was characterized by middle range proactive behavior. This indicated that the teacher used a combination of proactive and reactive responses; sometimes she monitored and reacted to early indicators of behavior problems, but other times missed or ignored them.

The FCPI showed middle-range character for redirection of misbehavior. This indicated that some of the teacher's attempts to redirect misbehavior were effective, particularly when she focused on the positives and used subtle cues. As a result, misbehavior rarely continued, escalated, or took time away from learning. The highest score for this factor was obtained in the FCPI in Lesson 8. Although there was a power interruption during class, the students were attentive and engaged. The class even got 100 % correct answers during peer instruction.

The score graph for student behavior in FCPI showed a distinctive trend. This indicated periodic episodes of misbehavior in the classroom. In Lessons 1 and 7, poor student behavior was observed. This was validated in the journal entry of the teacher where she mentioned that the students during Lesson 1 were uneasy and wanted to go home already during class hours, lacked interest in the lesson, and were noisy. In Lesson 7, the students got too excited and disorganized during the demonstration of acid-base indicators. Although student behavior scored low in Lessons 1 and 7, generally, as the implementation of the teaching strategies in FCPI progressed, the students in the FCPI became cooperative, engaged, and attentive. The FCPI implemented resulted in improved student behavior as they started realizing the importance of pre-class activities in understanding the lesson. This set-up also accommodated activities like demonstration and group activities which students liked better than mere lectures.

Based on the results of the study, the sense of "unsettledness" observed in FCPI can be attributed to the variety of learning activities conducted during the class time unlike in the traditional teaching method which is purely lecture. This "unsettledness" may be attributed to high student engagement in a flipped classroom. Based on the FGD participated in by 14 girls and 11 boys, students indeed had fun and enjoyed their science class. The students remarked that they were given advanced study materials through computer courseware and used Plickers™ during class. These activities were also their favorite science-related activities. They were also excited to use

the tablets and desktop computers. However, this "unsettledness" can be an obstacle to effective implementation of FCPI, thus, should be managed.

For the behavior management dimension, the findings showed that FCPI promoted redirection of misbehavior and being proactive. However, it was noted that the use of the FCPI gave the teacher more opportunity to be proactive based on the performance of the students in the pre-class activities. Based on the data, the FCPI improved student behavior in class by engaging them in activities and equipping them with prior knowledge which helped them perform better in class. It was recognized that setting clear behavior expectations was vital in managing behavior in the FCPI. The nature of this classroom set-up being activity-based and student-centered requires the teacher to be efficient in setting clear behavior expectations.

Factors that Contribute to Positive Climate and Behavior Management in FCPI

The following factors that promote positive climate and behavior management in FCPI surfaced from the classroom observations, students' and teacher's journal, and FGD.

1. *Communication of benefits.* It is natural to see resistance among students whenever a new teaching strategy is implemented in class. Therefore, it is very important that the teacher considering the flipped classroom approach should 'sell' the idea to students by laying down its benefits and the responsibilities of the students.

2. *Appropriate physical layout of the classroom.* The physical layout of the class allows for effective collaboration among students and easy monitoring of the teacher. Flipped classrooms encourage group activities in class. The classroom should be conducive enough to hold such activities. A strategic arrangement of the classroom will prevent misbehaviors like cheating, as reported during the FGD, from happening (Crouch et al., 2007).

3. *Matched pre- and in-class activities.* The design of pre-class activities should match the in-class activities for the flipped classroom instruction to be more effective. In relation to pre-class activities, the participants of the FGD mentioned that the science courseware aided them in:
    a. understanding the lesson during the pre-class activity,
    b. finishing in-class activities faster,
    c. applying the content of the pre-class activity to their science lesson,
    d. performing more activities in class,
    e. enjoying the in-class activities (including the peer instruction activity) more with higher level of participation,
    f. being more relaxed because they know the lesson that will be discussed in class,
    g. being able to follow the discussion of the teacher during class review,
    h. gaining confidence to perform in class,
    i. having complete notes before the class, and
    j. being more excited and motivated to attend the science class.

    All these benefits of a well matched pre- and in-class activities would promote positive climate and behavior management in class.

4. *Setting a common class goal.* Encourage the class to achieve a common goal. During the peer instruction activity, the students felt sad when the percentage of students who got

the correct answer was low. As a response, the students tried their best to get the correct answer on the second round because they wanted to do better. To do this, the students reviewed the questions and the choices. If the percentage was already high, they were happy, and they no longer changed their answers.

The participants during the FGD suggested the following to further improve the classroom environment in FCPI.

1. The pre-class activities should be within the level of understanding of the students and can be done independently within the given time frame. In the FCPI, majority of the students understood the pre-class assignment. However, several students reported that sometimes they found it difficult to understand the pre-class assignment because it was in English, some did not have transcriptions nor scripts, or the volume was too low. They needed more time to watch it 3 to 5 times to fully understand the lesson. The students suggested preparing a version of science courseware in Filipino. Like what is observed in Malaysia, students experienced difficulty in understanding pre-class activities delivered through English videos (Muniandy, 2018). To address this issue, the flipped classroom set-up gave the students ample time to clarify and discuss their difficulties with their teacher in class.

2. Involve the students in reinforcing discipline in class. Teachers and students creating expectations and rules in class together would build respect and develop relationships. This is evident in the FCPI. For instance, students in the FGD suggested the following schemes on how to prevent cheating and dishonesty in class.

    a. Check the honesty of co-learners.
    b. Require shading of answers instead of manually writing the letter of the answers.
    c. Erasures of answer during peer instruction should not be allowed.
    d. Teachers should move around to prevent the occurrence of cheating.
    e. Ensure that students were not peeking on the teacher's cellphone for the correct answer.

Conclusions

Fostering positive climate and behavior management in FCPI is facilitated by different factors which include communicating benefits, observing appropriate physical structure of the class, proper matching of the pre- and in-class activity, and encouraging the class to achieve a common goal. These factors helped improve positive climate and behavior management in FCPI. The FCPI experienced challenges in establishing relationships, positive affect, and respect. However, considering the factors mentioned above, these challenges were successfully hurdled as the FCPI scored better in all factors of positive climate at the end of the implementation.

Recommendations

This study provides a model for teaching science in a blended approach. The blended learning model combining flipped classroom and face-to-face peer instruction is an effective means of providing students with sufficient support in terms of learning materials, technology, scaffolding, and social interaction.

Teachers implementing the flipped classroom with peer instruction should be cognizant in developing a classroom environment specifically on positive climate and behavior management.

This can be done by explaining well to the students the importance of pre-class activities in understanding the lesson and to their performance in class. In a positive classroom environment, students can develop confidence and feel safe and joy which can greatly influence the way they participate and perform in class.

Teachers should be given support and training on how to modify the classroom environment to encourage academic engagement and discourage disruptive behaviors in face-to-face classes. As seen in the study, establishing positive climate and behavior management could be a challenge on the first few days of implementation. Engaging face-to-face activities and equipping students with prior knowledge helped them perform better and develop positive behavior in class. Recognizing the nature of this classroom set-up being activity-based and student-centered, clear behavior expectation was vital in managing behaviors.

In addition, it is recommended that teachers seek training and assistance on how to incorporate technology in class, specifically in finding the right blend of pre- and in-class activities. They can try other active learning strategies for face-to-face classes like problem-based learning, simulation, debates, and think-pair-share activities (Gilboy et al., 2014). Likewise, flipped classrooms in a full online mode integrating asynchronous and synchronous activities, follows the same principle of seamless connection between pre- and in-class activities.

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Abstract

Abstract in 150-250 words.

Keywords: No more than five (5) keywords.

Introduction (Center Heading 1)

This section contains a clear historical background of the study, showing why the research had to be undertaken. In this section, the author(s) shall have the opportunity to expound on what the research says about the research problem, and show clear support for the need to undertake the research, through appropriate research gap analysis.

Objectives (Center Heading 2)

This section provides a clear statement of the goals and objectives of the research.

Conceptual/Theoretical Framework (Center Heading 3)

The conceptual or theoretical framework would be expected for research studies that dealt with empirical procedures and methodologies. A framework of this nature would provide for clear interrelationships and direction of interactions of variables which the researcher expects to show by his/her data and data interpretations. It should be noted that variable interactions may be easier to understand if they were to be presented in illustrated model formats.

Methodology (Center Heading 4)

This section includes brief discussions of data collection procedures and analyses. Data must be presented in appropriate tables.

Results and Discussions (Center Heading 5)

Analytical discussions must present possible relationships of the results of the study and the findings from other studies specifically reviewed for this purpose. Post analysis data may be presented in both statistical tables and appropriate models and figures.

Include subheadings as are necessary.

Conclusions and Recommendations (Center Heading 6)

Conclusions must be according to the objectives of the study.

Recommendations must reflect the objectives and conclusions of the study.

References

General format must follow the suggestions for authors, but generally must follow the APA Style for publications. (As of writing, APA's publication manual is in its 7th edition.)

Template for Qualitatively-Oriented Articles

Title of Article

Author 1[1] and Author 2[2]

[1]Position, Institutional Affiliation, Country, Email address

Abstract

Abstract in 150-250 words.

Keywords: no more than five (5) keywords

Introduction (Center Heading 1)

This section contains the historical background of the study, including specific reports and studies that provided direct support to the research problem. Some relevant part of the literature shall be included in the discussion of the research problem to establish more strongly the need to undertake the study.

Objectives of the Study (Center Heading 2)

This section contains both the research over-all goal and the specific objectives to be attained.

Relevant Studies or Review of Related Studies (Center Heading 3)

Review of studies that are highly related to the current study. After the relevant studies have been presented, a synthesis of these may be presented and the relationship of such synthesis must be related to the study under consideration.

Subheading may be determined as necessary. In these subheadings, specific observations may be noted and statistical tables presented as well as figures and models.

Discussions (Center Heading 4)

In this section shall be inserted full discussion of results and finding, discussed more deeply in relation to the related studies already reviewed. Subheads may be determined and included in the discussions.

Conclusions (Center Heading 5)

The conclusions of the study must reflect the objectives of the research.

Recommendations (Center Heading 6)

All recommendations must appropriately correspond to the conclusions, and therefore the objectives of the study.

References (Center Heading 7)

Follow the APA Style Guide (As of writing, APA's publication manual is in its 7th edition.)

Style Guide for Full Paper Submission

The paper should be 15-25 pages long (including tables, figures, and references) and prepared preferably in Microsoft Word format. The author(s) should provide a title, the name(s) of the author(s), position(s), institutional affiliation(s), institutional address(es), email address(es) and key words (no more than five). You may make use of the template for preparing your paper: Journal Article Template (Qualitatively-Oriented); Journal Article Template (Quantitatively-Oriented). Detailed guidelines are as follows:

1. **Font type**
   The whole text should be in Arial.

2. **Margins**
   The paper should be A4 size (21 x 29.7 cm). All margins (top, bottom, left, and right) should be 1 inch.

3. **Line Spacing**
   The whole text should be single-spaced.

4. **Title**
   The title of the paper should be 14-point, bold, in capital and lower case letters, and centered.

5. **Author Information**
   Use 12-point and centered for the author name(s). The Western naming convention, with given names preceding surnames, should be used.

   The author name(s) should appear below the title, with one blank line after the title.

   Use 10-point for author(s)' position(s), institutional affiliation(s), country, and email address(es).

   The author(s)' position(s), institutional affiliation(s), institutional address(es), and email address(es) should appear below the author name(s), with one blank line after the name(s).

6. **Headings**
   - Heading font (with the exception of the paper title and the abstract) should be 14-point Arial and in bold.
   - Headings should be centered and in capital and lower case letters [i.e. nouns, verbs, and all other words (except articles, prepositions, and conjunctions) should be set with an initial capital].
   - There should be two blank lines before each heading and one blank line after it.

7. **Subthemes**
   - Subtheme(s) should be 14-point Arial, in bold capital and lower case letters, and flushed left.
   - There should be one blank line before and after each subtheme.

8. **Abstract**
   - The abstract heading should be 14-point Arial, bold, centered.
   - The abstract should be in **150-250 words.**
   - The main text of the abstract should be 12-point Arial, italicized.
   - Alignment of the main text of the abstract should be justified, no indent.

9. **Key Words**
   - Include **at most five** keywords.
   - Use 12-point Arial. The keywords should appear below the abstract, with one blank line after the abstract.

10. **Main Text**
   - In general, paragraphs should be separated by a single space.
   - All paragraphs must be in block format.
   - Text font should be 12-point Arial, single-spacing. Italic type may be used to emphasize words in running text. Bold type and underlining should be avoided.
   - The first line of each paragraph should not be indented.

11. **Tables and Figures**
   - Tables and figures should be numbered and have captions which appear above them.
   - Graphics and pictures should not exceed the given page margins.
   - Captions should be 14-point centered.
   - The tables and figures of the paper should follow the APA citation style.
   - There should be no space between the caption and the table/figure.

12. **Footnotes**
   - Footnotes may be used only sparingly. A superscript numeral to refer to a footnote should be used in the text either directly after the word to be discussed or – in relation to a phrase or a sentence – following the punctuation mark (comma, semicolon, or period)
   - Footnotes should appear at the bottom of the page within the normal text area, with a line about 5 cm long immediately above them.
   - Footnotes should be 10-point and aligned left.

13. **References**
   - The author-date method in-text citation should be used. Following the APA format, the author's last name and the year of publication for the source should appear in the text.

   - All references that are cited in the text must be given in the reference list. The references must be in APA format and arranged alphabetically at the end of the paper.

Sample:

Surname, A. A. (year). Article title. *Title of Journal, volume number*(issue number), inclusive page numbers.

Surname, A. A. (year). *Title of book.* Publisher location: Publisher Name.

Surname, A. A., Surname, B. B., & Surname, C. C. (2000). Title of article. *Title of periodical, volume number*(issue number). Retrieved from URL/web address.

Surname, A.A. (Year, Month). *Title of paper.* Paper presented at name of conference, city, country.

14. **Length**

The paper should be 3,000-7,000 words including tables, figures, and references.

Author Guide

The International Journal on Open and Distance e-Learning (IJODeL) welcomes original research articles, book reviews, theories, and best practices pertaining to ODeL worldwide. Articles should be 3,000-7,000 words including tables, figures, and references.

A publishable quantitatively-oriented paper should contain the following:

1. Abstract
2. Objectives
3. Conceptual/Theoretical Framework
4. Methodology
5. Results and Discussions
6. Conclusions and Recommendations
7. References

Go to: Quantitatively-Oriented Journal Article Template

A publishable qualitatively-oriented paper should contain the following:

1. Abstract
2. Objectives of the Study
3. Relevant Studies or Review of Related Studies
4. Discussions
5. Conclusions
6. Recommendations
7. References

Go to: Qualitatively-Oriented Journal Article Template

To submit an article, the IJODeL website and follow the steps in the online submission system.