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Research Article

Mathematics Teachers' Perception on Modular Distance Learning: A Phenomenological Study

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ABSTRACT

This study aimed to capture the lived experiences of Mathematics teachers on modular distance learning. It explored mathematics teachers' perception of modular distance learning, describe the challenges, and struggles in the new normal, unveil the coping mechanisms of mathematics teachers on the demand of modular distance learning, and verify the effects of modular distance learning on students' mathematics performance. This phenomenological study used Colaizzi's method of data analysis to interpret and analyze the data. Nine (9) teacher-participants were recruited using purposive sampling technique. The study used the interview method in gathering data. In this study, teacher-participants perceived that modular distance learning is one of the best ways to continue students' learning. However, students' mathematics performance using modular distance learning is far below the expected standard. Identified contributing factors were students' attitudes, teachers' workloads, digital infrastructure and gadgets, slow internet connections, lack of parents' support, and students' motivation. The findings of this study can be used as a basis or springboard for revision of implementing guidelines of modular distance learning enactment policies that would provide intervention to the existing identified problem.

Keywords: *distance learning, mathematics education, modular learning, teacher's perception*

Introduction

The COVID-19 pandemic has posed several challenges in education such as suspension of classes which marks the beginning of the shift to the new normal. School closures have hampered the delivery of face-to-face instruction,

which serves as a lesson and caution for all educators and education players to invest in the different emerging educational technologies (Onyema et al., 2020). Education institutions, where throngs of students converge daily, become a dangerous place because of the

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possibility of spreading the virus (Sintema, 2020). Thus, online and distance learning have become the primary options for educators to continue delivering the lessons to their students. Investing in online education and computer learning applications should be considered one of the top priorities of schools nowadays (Ionescu et al., 2020; Palero & Mutya, 2022). Furthermore, the continued devastation of the virus in different countries around the world posed a more significant challenge for a transformative learning environment for the global education community (Azoulay, 2020).

Several modalities were adopted by Department of Education (DepEd), including a synchronous and asynchronous distance learning method. Blended learning was used to deliver lessons to the students, some schools used a modular learning approach, and others used both modular and online learning. However, the success of online classes varies mainly on the part of the teacher in the design and delivery of the learning experience (Ionescu et al., 2020). That is why the teacher's role in distance learning is more important than face-to-face learning. They must equip themselves to use the available learning platforms and applications. The more significant challenge lies in mathematics instruction. Improving mathematics learning is a considerable challenge worldwide. Thus, there is a need for a specialized approach in mathematics education, especially during crisis-situation like the current pandemic (Roschelle et al., 2010).

The challenges have opened our eyes to learn new things as a teacher; it has developed our competencies and has given us the insight to look at the other side with vigor and a positive outlook (De Vera, 2020). It was revealed that with the sudden shift to modular distance learning, teachers have plenty of adjustments to make. They considered mathematics a challenging subject for the students (Akar & Erden, 2021) especially to the working students (Mutya et al., 2022). Even with the face-to-face set-up, students' performance in the matter lies way below the expected standards in many instances. This is where the challenges on the part of the teachers come in. The transition from face-to-face learning to a modular approach limits the interaction between the

students and the teachers, which augments the low performance of the students in mathematics (Murphy, 2020).

The study of Akar and Erden (2021) revealed that most of the teachers in the new normal favored the use of the online video conferencing method by using a digital learning platform. Even though some of the teachers are still learning the use of these digital platforms, they were still able to catch up with the demands of the new normal of learning. However, in as much as teachers are trying to adapt to the digital instruction, students are faced with the dilemma of continuing the teaching or just stopping and waiting for the pandemic to subside because students do not have the gadgets to use to participate in the discussion. The limited to no devices to use at home for online learning added to the teachers' and the students' difficulties. Furthermore, to attain the aims of education, teachers must possess knowledge of the subject matter (Hamid et al., 2012). A more profound understanding of the subject matter offers students a wide range of explanations to understand complex concepts and ideas (Kind, 2009). Moreover, teaching subject outside the expertise of the teachers influences teachers' pedagogical knowledge and would somehow affect the teacher's self-confidence (Mizzi, 2013). Without the teacher's competence to deliver the lesson would hamper the learning process as much as we are discussing mathematics as a subject. However, notwithstanding the challenges of distance education like capability building, adjustments to the new trends in education, and attitude in online education, teachers were still very resilient in embracing the new normal of education (Ventayen, 2018). The school and DepEd must provide the teachers with support and adequate funding for the implementation of modular distance learning. Furthermore, attention should also be given to module reproduction, assessment tools, and capacity building in measuring the students' performance in the context of the new normal (Gueta & Janer, 2021).

Since the demands of online learning are enormous, the education department opted to use modular distance learning for most learners. Where teachers are to prepare the modules (Auditor & Mutya, 2022) and give them to the

students every week, students are to answer these modules at home with the guidance of their parents, siblings, and other relatives. Teachers are remotely giving instructions using different social media platforms. In this setup, a full-blown learning interaction is hampered. In these situations, teachers are to create interventions relative to achieving education goals, especially in mathematics instruction (Saga & Agua, 2021). Parents' participation in the conduct of modular distance learning is essential. It is a widely favored modality for the parents since it does not require them to provide their learners with the needed gadgets and internet connection for an apparent financial constraint. Parents' involvement in modular distance learning is a significant factor; they are the primary guide for the learners in facilitating modular instruction (Saga & Agua, 2021). It was observed that students with parents or members of the family with high education levels and concern towards their students' learning are more likely to succeed in the modular distance learning approach as compared to parents with low income, low education level, and indifference to their students learning (Akar & Erden, 2021).

Teachers were trying to monitor students' progress closely and made themselves available for consultation with the parents of the students for some clarifications regarding the lessons in the module. The teachers observed that modular distance learning has contributed to the alienation of the average and below-average students in the learning process (Akar & Erden, 2021). Only those gifted students can perform the task in the module, thereby contributing to the low turn-out of completed modules returned during retrieval.

Several factors have been identified as disadvantages of modular distance learning, some students are not doing the task honestly, parents are the ones doing the homework in the module, and parents have difficulty facilitating their students in the modular approach. With these disadvantages, teachers identified some advantages to the modular approach, such as continued learning despite the pandemic, parents have realized their essential role in educating their students, the modular approach teaching the students the values and lessons,

and teachers becoming open-minded in terms of equipping themselves with the knowledge on digital learning approach (Anzaldo, 2021).

The pandemic has impacted the education sector in a way that no one could imagine. However, in light of this situation, teachers are resilient to provide learning to the students using different modalities; they trained and equipped themselves with the new methods and strategies to offer authentic learning to the student in the new normal. Thus, teachers' perception of modular distance learning is vital to enacting policies and decision-making in the future. Whether online learning or a modular approach, teachers, and parents play an essential role in attaining the desired learning outcome for the students.

With the demands of quality learning for the students in the context of distance learning, especially in mathematics, teachers shifted their instruction from the traditional face-to-face instruction into a modular approach vis-à-vis online education. The capacity building was conducted and equipping the teachers with the needed skills to respond to the pandemic (De Vera, 2020). DepEd's Learning Continuity Plan lays out the guidelines for the continued delivery of transformative education to the learners even during emergency-situation (DepEd, 2020). However, teaching mathematics has always been challenging, even before the pandemic; it would always generate a deficient performance among other subjects in the curriculum (Bjuland & Mosvold, 2015; Larkin & Jorgensen, 2016; Lee & Kung, 2018). In this aspect, the challenge of mathematics instruction has become a burden on the part of the teachers, especially since that education shift was drastic and there is only minimal preparation for the change. This reason prompted this researcher to conduct this research to capture the lived experiences of mathematics teachers on modular distance learning.

Objective of the Study

This study aimed to capture the lived experiences of Mathematics teachers on modular distance learning and seeks to (a) determine the perception of mathematics teachers about modular distance learning, (b) describe the challenges and struggles in the new normal,

and (c) unveil the coping mechanisms of mathematics teachers on the demand of modular distance learning, and (d) verify the effects of modular distance learning to students' mathematics performance.

Methods

The study used the descriptive phenomenological approach. The aim is to understand the most essential meaning of a phenomenon of interest from the perspective of those directly involved in it (Giorgi, 1997). Husserl (1970, 2012) provided the philosophical underpinning for phenomenology. This examines a phenomenon as individuals experience it and directly describe it without considering its causal explanations. Phenomenology requires a new way of looking at things; researchers must step out of their own experience with all their predispositions and focus on the commonality of a lived experience within a particular group. The goal of the approach is to come up with a description of the nature of the phenomenon (Cresswell, 2013; Creswell & Poth, 2016).

For data collection, the researcher employed interviews with the participants who were recruited through purposive sampling technique and passed the inclusion criteria in the division of Cebu City, Philippines. They were chosen purposively because the study is specific to a certain phenomenon only (Lopez and Whitehead, 2013), and the selection criteria were as follows: (a) graduates of mathematics-related baccalaureate degrees, (b) mathematics teacher teaching in either JHS or SHS mathematics subjects, and (c) mathematics teacher teaching using the modular distance learning as the modality, and lastly (d) willingness to participate in the study. Marton and Booth (1997) recommend the interview as the preferred data collection tool in phenomenological research because interviews provide flexibility in probing for clarification and gathering sufficient detail to develop a detailed description of participant perceptions. There were eight (8) questions for the teacher-participant to answer that were expected to yield the best information necessary for the conduct of this study. Interview guide questions were validated by expert in research instrumentation.

Considering the use of resources and time to be spent by the participants, the study considered the following dimensions of research ethics in the whole duration of the study: (1) Informed consent, (2) vulnerability of research informants, (3) privacy and confidentiality of information, and (4) transparency. The data were collected, interpreted, and analyzed. Colaizzi's method (1978) of data analysis was utilized and deemed most appropriate. This method anchored the components of Husserlian phenomenology, putting a premium on the description of the lived experience (Colaizzi, 1978; Morrow et al., 2015). The researcher employed deductive thematic data analysis to describe the phenomenon. The researcher started with the response coding and then proceeded to categorize the codes and identify the different themes based on the responses of the teacher-participants.

Results

Eliciting accurate descriptions of the participants' experiences was done by asking the appropriate questions. This focused on identifying the main essence of the central theme that expands knowledge. The descriptive analysis of transcripts revealed four (4) major themes which characterized the participants' responses: (1) Modular Distance Learning as Continuity for Learning; (2) Challenges and Struggles in the Modular Distance Learning; (3) Coping Mechanisms of Math Teachers; and (4) Effects of Modular Distance Learning to Students' Mathematics Performance. These themes were labeled using direct quotations from the participants; this was done to express the original idea conveyed by the participants.

Theme 1. Modular Distance Learning as Continuity for Learning

Modular Distance Learning (MDL), as generally employed by the DepEd in the new normal of education, is perceived by the teachers as the best way to continue the students' learning process. It is an entirely acceptable and safe way to continue the students' academic growth. In support of this, participant 2 expressed that:

"My insight about Modular Distance Learning is that it is one of the best ways

to continue the process of education despite being in this pandemic time" (Participant 2).

Since face-to-face classes are not possible during the pandemic, MDL can be used as a substitute. However, several downsides have been identified by the teachers. Most common is that students do not learn in the MDL set-up; if there is learning, it is limited. Citing several reasons such as no formal teaching happened, students submit outputs for compliance purposes only, and students have no focus on what they are doing in MDL. Participant 8 shared that,

"Students learn less in modular learning. The students are not schooled because their minds and hearts are not focused on doing the task. They are more on compliance rather than on learning. It made me feel that I am no longer a teacher but a checker (Participant 8).

Furthermore, teacher-participant also perceived MDL as less effective because students were not prepared during the implementation of MDL, the change was drastic, and students were so reliant on the teachers doing the explanation rather than reading the modules and learning from them. Thereby resulting in low performance of the students and low turn-out of output submission during retrieval. Participant 7 said that,

"I feel that majority of our students are not prepared for MDL; only a few students are reading the modules and are answering them. It yields a poor quality of education and tedious to the teacher because we need to re-teach or attend to students' concerns, and frequently it is hard to explain things online due to poor internet connection" (Participant 7).

Teachers and students are trying to adapt to the demands of the new normal, specifically on modular distance learning; however, for some reason, actual teaching and learning could not take place due to some factors affecting the process. Slow to a limited internet connection, digital infrastructure and gadgets, students' attitudes, and teachers' workloads. All these are affecting the learning of the students. Although the approach is modular, teachers must connect to the students to follow up on their progress and entertain some of their

concerns; therefore, connectivity is still necessary for modular learning.

Theme 2. Challenges and Struggles in the Modular Distance Learning

Slow internet connections, digital infrastructure, and gadgets are the reasons why learning is a challenge in the modular approach. Teachers need to connect with their students for consultations, follow-ups, and entertain questions regarding the lessons in the modules. One of the participants clearly pointed out:

"We have encountered many problems in MDL; one is the slow internet connection. Since in-person classes are not allowed, the internet signal is significant, so communication with our students will continue. Secondly, most of our students do not have gadgets, so reaching them is hard. We could only address our concerns to them when their parents or guardians visit the school once a week. Lastly, the results of the modules' scores are unreliable since we are not sure if they are the ones who are answering it" (Participant 3).

Teachers find it difficult to manage their time in modular learning; from printing and sorting to the distribution of the module, checking outputs, and conducting online consultation are some of the perceived challenges teachers encounter in modular distance learning. The addendum is that teachers have difficulty measuring the learning of the students because it is difficult for them to verify the authenticity of the outputs submitted. Participants shared that,

"...the struggles I have faced in the modular distance learning are the preparation, reproduction, and sorting of modules, checking of students outputs, assessing whether students have truly learned something from the modules, the validity of students answers and supplementing the lessons in the module" (Participant 6).

These factors limit the teacher in communicating with their students; therefore, they could not provide intervention, jeopardizing the authenticity of the outputs submitted as perceived by the teacher-participants.

Theme 3. Coping Mechanisms of Math Teachers

Time management and acceptance of the new normal way of teaching are some of the coping mechanisms of the teachers in the delivery of modular distance learning. Participant 1 commented that,

"I needed to manage my time wisely, and always do extra work even after working hours" (Participant 1).

Another teacher-participant revealed that acceptance is the key and equipping themselves with the necessary skills in the new normal way of teaching.

"Acceptance is the first step; I need to also equip myself with the skills in making instructional materials and computers to make effective supplementary materials. Go with the flow, don't resist change" (Participant 6).

Most of the teachers said that having an open mind in the new set-up of education will help teachers be more optimistic in their profession; despite all the hardships and struggles they are facing, there are more reasons to smile and continue teaching, providing quality learning to the students.

Furthermore, although internet connectivity remains a challenge in the modular distance learning approach, most teacher-participants have no choice but to use digital and social media platforms to communicate with their students. The most common platform used by the teachers is Facebook Messenger, where teachers are to create group chats to communicate, give instructions, entertain questions from the students, and provide interventions. Another is the Google Meet, where teachers can conduct online classes to supplement the modules, but only for those students who have the gadgets.

"I connect to my students through Facebook, messenger, and google meet" (Participant 7).

Theme 4. Effects of Modular Distance Learning to Students' Mathematics Performance

Most teachers perceived that modular distance learning has greatly affected the students' math performance; low scores in their submitted outputs have been observed, especially among students who are not inclined in

mathematics. The factors attributing to this low performance of the students are lack of resources (gadgets), students' attitude, lack of learning engagement between teacher and student, poor reading comprehension, lack of critical thinking, lack of parental guidance, and plenty of distractions. Participant 7 said,

"students have deficient performance in mathematics; they actually do not research but just copy answers from their classmates. Factors can be poor reading comprehension, poor creativity and critical thinking skills, lack of parental guidance, and too much time on the social media, digital games, and online movies".

Moreover, students' attitude has been attributed to this low performance; some students just copy the outputs of their classmates. One teacher-participant believes that students are less motivated to do the task in the module.

"In my experience, some students are known to be lovers of this subject (that was way back when schools were still into face-to-face), but these particular students were less motivated using MDL. However, I understand them because they are not used to having math alone. That is why I encourage them to message me if they may find something complicated, and I am thankful to one of our math teachers who has with him lots of videos as he explained different math topics" (Participant 7).

Discussion

The general perception of teachers in implementing modular distance learning is that it is the only practical way to continue the students' academic growth during the pandemic. It is safe from the threat of COVID-19 infection since the interaction between students, parents, and teachers is limited. This affirms the DepEd's Thrust in the Learning Continuity Plan that education must continue. Online education and distance learning have become the primary options for educators to continue delivering the lessons to their students. Investing in online teaching and computer learning applications should be considered one of the top priorities of schools nowadays (Ionescu et al., 2020).

Despite all that has happened during the pandemic, students' learning should not be compromised. However, to continue the teaching of the students, several disadvantages of MDL were identified, teachers perceived MDL as less effective, low turn-out in the submission of outputs, students were less motivated in completing their tasks, slow internet connection for teachers' follow-up and consultations and teachers' workloads, these factors have attributed to less teacher-student engagement which results to deficient performance of the students in mathematics. These are supported by the findings of Akar and Erden (2021) that extra considerations should be afforded to mathematics as a challenging subject for the students. In many instances, students' performance in the matter lies way below the expected standards. This is where the challenges on the part of the teachers come in. The transition from face-to-face learning to a modular approach limits the interaction between the students and the teachers, which augments the low performance of the students in mathematics (Murphy, 2020). Improving mathematics learning is a significant challenge worldwide. Thus, there is a need for a specialized approach in mathematics education, especially during crisis-situation like the current pandemic (Roschelle et al., 2010).

According to De Vera (2020), the challenges brought about by the unexpected health disaster have opened our eyes to learn new things as teachers, developed our competencies, and given us the insight to look at the other side with vigor and a positive outlook. These challenges, as recognized by the teacher-participant, come from the side of the students, teachers, and the parents (Geverola et al., 2022; Cudillo et al., 2022). Their struggles include less student-teacher engagement, along with limited knowledge of the use of the different digital infrastructures and a lack of materials to engage in digital platforms such as the gadgets. Moreover, teachers perceived students' attitude as a challenge because learning cannot happen students are not motivated to perform their task as stipulated in the module. It was revealed that with the sudden shift to modular distance learning, teachers have plenty of adjustments to make. Considering mathematics

as a challenging subject for the students (Akar & Erden, 2021).

It was also challenging on the part of the teachers to manage their time, from the preparation, printing, and sorting of the modules, distribution, retrieval, and conducting online classes and consultations up to the checking of outputs and measuring students' performance. These validated the findings of Akar and Erden (2021) that the limited and sudden change of modality with less time to prepare added to the struggles of the teachers, no gadgets to be used at home for online learning for the students. Embracing the challenge of distance education, like adjustments to the new trends in education and attitude in online education, proves that teachers were still very resilient in adopting the new normal of education (Ventayen, 2018).

Parents' involvement in modular distance learning is a significant factor; they are the primary guide for the learners in facilitating modular instruction (Saga & Agua, 2021). The school and DepEd must provide the teachers with support and adequate funding for the implementation of MDL. Furthermore, attention should also be given to module reproduction, assessment tools, and capacity building in measuring the students' performance in the context of the new normal (Gueta and Janer, 2021).

Nine (9) teachers identified as participants of this study, all from the division of Cebu City. It is highly recommended that a similar study be conducted with a more significant number of respondents and a broader scope. Furthermore, the results of this study can be used as a springboard for policymaking and advancement or revision of guidelines in the implementation of modular distance learning.

Implication of the Study

The modular distance learning approach during pandemic time is a good and safe path to continue the students' learning process. However, for some reason, the said modality is ineffective and yields low student mathematics performance. Issues like students' attitudes, teachers' workloads, digital infrastructure, and slow internet connections have been identified as the culprit. The study unraveled the teachers' views on the conduct of modular distance

learning in the context of the pandemic. The results can be used for a possible revision and adjustment in the implementing guidelines of modular distance learning. Education policy-makers can enact provisions based on the results of this study. Furthermore, teachers can perform their duties precisely and adjust their strategies, while parents can take part in the education of their students as motivators. The ultimate beneficiary of this undertaking are the students; they must bear in mind that their education does not depend on their teachers and parents but only on their drive to learn no matter what the situation is.

Conclusion

Most of the teachers in the Division of Cebu City believe that modular distance learning is the most practical way to continue the educative process under the framework of distance learning. They think that it is safe to use because it limits the interaction among students, teachers, and parents, thereby preventing the possibility of infection. However, challenges identified affecting the implementation of the program, such as less teacher-student engagement, students' attitudes, lack of gadgets and a slow internet connection, and teachers' workloads, resulted in the low performance of the students in mathematics. The low performance was attributed to several factors, as mentioned earlier, but more focused on students' attitude towards the modular approach, few submissions, and low scores in the activities were also identified as reasons affecting the low performance of the students.

Teachers revealed that they communicated to their students via Facebook messenger group chats, which is the most common and ready-to-use platform. Others are conducting online sessions with their students using google meet. The coping mechanisms of teachers include proper time management, equipping teachers' skills and competencies in relation to the new way of teaching in the new normal, accepting the reality that they need to adjust to the norms, and embracing change as part of their lives. Having an open mind and being more optimistic in their profession despite all the struggles they are facing.

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