

## **Teaching Challenges in Limited Face-to-Face Classes in Mathematics Implementation: A Case Study of Modality Transitioning in a High School in the Philippines**

Emmanuel S. Saga

*Bayugan National Comprehensive High School, Philippines*

*emmanuel.saga@deped.gov.ph*

### **Abstract**

The modality transition introduced by the Department of Education gave hope to teachers and students in ensuring quality education amidst the pandemic, however, it unveiled numerous challenges. The study was concerned with identifying and investigating the challenges of the teachers in teaching the students of a High School in the Philippines by its fresh implementation of limited face-to-face classes. A case study research design was utilized in formulating the research undertaking. Round Table Discussion (RTD) was used by the researcher to gather data relevant to the study. Three (3) Mathematics teachers participated in the RTD and 19 student participants participated also in the discussion. The conduct of the discussion was held at Bayugan National Comprehensive High School (BNCHS) and was streamed via Google Meet. Teachers' viewpoints demonstrated that instructional strategies were neglected, particularly since most Philippines schools employed modular distance learning as a modality. The performance of learners who participate in remote learning is generally worse than that of learners who attend limited in-person classes. Although the modular distance learning modality provided teachers with fewer pedagogical strategies for the students, it is still necessary to ascertain the difficulties in transitioning between the various modes of instruction at BNCHS.

**Keywords:** limited face-to-face, modality transitioning, teaching challenges

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### **Introduction**

The educational system of the Philippines encountered a rapid transition due to the global surge of Corona Virus Disease 2019 (COVID-19). The pandemic's disruption has compelled educational leaders to transition to alternative teaching modalities that do not require in-person or physical contact. To better address this educational conundrum, the Department of Education (DepEd) released on June 19, 2020, Order No. 12, s. 2020, or the Adoption of the Basic Education Learning Continuity Plan (LCP) for School Year 2020–2021, in light of the COVID-19 Public Health Emergency.

In contrast to students who learn in-person, this extended distance education regrettably has detrimental effects on the welfare of the students (Foo et al., 2021). Teachers also had to deal with a lot of issues, such as low student engagement and participation (or lack of parental support), students not having access to technology, concern about students' welfare, the inability to have in-person interactions with students, juggling work and personal obligations, and picking up new technology (An et al., 2021). Teachers who are on the front lines of education delivery have adjusted to this change for almost three years, despite the challenges.

Different research findings have been discussed regarding how students can be taught mathematical concepts through remote learning using pedagogical strategies (including but

not limited to metacognitive learning, TPACK-based strategy, and Cooperative Learning Strategies (CLS)). A small relationship was discovered between the domains of technology and pedagogy and technology and content, but a large correlation was encountered between pedagogy and content, according to Archambault and Crippen's (2009) investigation into the correlations of technology, pedagogy, content, and the combination of each of these areas within the TPACK Framework. Using the methodical implications of the self-determination theory (SDT), Knopik and Oszwa (2021) investigated the benefits of cooperative learning in mathematics to 104 sixth-grade students during the COVID-19 pandemic in distance learning settings. The learning process should be enhanced, they said, not just during the COVID-19 pandemic, by having more students participate in the mutual explanation and interpretation of new issues to one another, as if they were problems to be solved.

Bakar and Ismail (2019) examined research articles that have been published about the effects of Metacognitive Learning Strategies (MLS) and discussed how the MLS approach functions as an intervention. The majority of studies investigating the effects of MLS compare student achievement between pre-and post-test results in an experimental setting. Their results demonstrated that establishing a teaching approach that considers systematic operation and prioritizes it is highly logical and advantageous.

Even though the groundwork for pedagogical strategies had been established long before the pandemic, the pandemic compelled a widespread adoption of these models due to the necessity of significantly altering teaching and learning activities due to the shift in circumstances (Vijayan, 2021).

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The changing circumstance was welcomed with positive forthcoming, especially by the students and the parents (Stoian et al., 2022). Nevertheless, teachers must now, however, abandon the practices they have been confronted with in recent years and adopt a limited delivery of face-to-face teaching strategies instead. Maintaining both the safety of the students and the quality of education is a difficult task for educators, which makes it difficult to modify their teaching strategies. These challenges arise from several factors, including 1) a small number of students who attend class following the rules; 2) upholding appropriate health precautions before, during, and after classes; 3) evaluating the students' prior knowledge or skills from previous distance learning experiences; 4) limited student-to-student interaction; and other factors.

In response, the Department of Health (DOH), DepEd, and the government generated the audacious decision to reopen classes following careful planning and preparation. In accordance with Circular No. 3, s. 2021, the DepEd and DOH have jointly released a

Memorandum that addresses the operational guidelines for implementing limited face-to-face learning. An increasing number of schools have reopened for classes since its publication.

Therefore, the objective of this study was to determine and look into the difficulties teachers at Bayugan National Comprehensive High School were having instructing students in light of the school's recent implementation of limited face-to-face classes.

## **Methods**

### **Research Design**

The present investigation is a case study. The primary concentration is on the cases of three teachers who are sharing their teaching strategies and taking part in limited in-person classes during the pandemic. Since the researcher utilized the role of interviewer/moderator, the study was considered an investigation of the teachers' perspectives on the subject matter under discussion from that specific point of view.

### **Research Participants**

Teachers who employed limited face-to-face instruction and had knowledge of distance learning were the study's participants. Furthermore, the participants worked as math teachers at the Division of Bayugan City's Bayugan National Comprehensive High School. The group was mediated by the researcher. Participants in the virtual audience/viewer who were not instructors at the aforementioned school were also requested to submit questions, observations, and new insights through the use of a Round Table Discussion (RTD) setup. The RTD included 19 virtual participants in total.

The three case study participants were the school's full-time math teachers. The duration of teaching experiences and pedagogical strategy pieces of training attended were taken into account. To produce a sizable amount of data for analysis, both were prompted to participate.

To create a frame of reference for analyzing the responses that were required for the study, the researcher gathered their background information. Participants were provided with a semi-structured questionnaire to assist them in preparing themselves for the study's conduct.

### **Data Gathering Procedure**

The researcher requested permission from the principal of the school before beginning the case study to survey the research participants. Subsequently, the investigator dispatched a letter of intent to the subjects, providing them with an explanation of the study's objectives. This procedure was performed to guarantee that every school would be willing and able to participate in the study. The researcher provided the schedule and plan for the virtual discussion after receiving approval.

During the initial gathering, the investigator facilitated a cooperative planning session for the group. The objective of this was to familiarize the attendees with the specific objectives and enable them to prepare themselves for their answers during the second meeting. The researcher conducted the interview and led the discussion during the second meeting.

The three teacher-participants were oriented that the entire interview session was recorded and documented. Online evaluation forms regarding significant learning for virtual participants were disseminated after the RTD was done.

In addition to serving as moderator, the researcher actively participated in the RTD as an interviewer. The study's objectives, which included how to use pedagogical strategies to help students learn mathematical concepts through remote learning, how to ensure that teachers have the tools they require to improve their teaching both during and after pandemics and how to support their coping mechanisms when a modality shifts, were among the questions posed to the participants. In certain cases, the researcher also asked the participants to defend or elaborate on their arguments during discussions on discussion boards. Participants will be requested to verify in person at the final meeting whether the recorded response from the RTD corresponds with their actual responses.

After the data was collected, the researcher then watched the videos repeatedly to familiarize the data. The interactions and interview data were transcribed and encoded. To make sure the transcripts were appropriate; the encoded data were examined once more alongside the audio and video. They were then prepared for data analysis and coding.

## **Data Analysis**

To avoid imposing meaning from one teacher to another, the researcher listened to the recorded interview session and conducted an analysis (Seidman, 2006). This made it possible to analyze the data as both a collection of cases and as a single case.

Since the teachers' beliefs about their experiences were expressed during the interviews, a detailed analysis started there. Open-ended questions were posed while the RTD was being conducted. Thematic analysis was subsequently employed to examine the RTD responses. These analytic techniques complement the qualitative methods proposed by Creswell (2014). The researcher employed both inductive and deductive analysis, gathered data sources in a natural setting, and concentrated on the meanings of the participants.

Following was the analysis of the data. As we awaited the transcripts, we listened to every recorded interview, enabling the researcher to understand the interview as a whole. Relevant passages or phrases were underlined, interruptions like pauses to answer phones were crossed out, and significant chunks were highlighted. The researcher then identified themes and provided those themes labels (words and phrases). The researcher underlined the themes in each passage and enhanced them as they became more obvious and the relationships between them became evident.

Subsequently, an investigator produced a theme chart enumerating themes and indicating segments of the interview shedding light on them. Themes were rearranged by weight, reflecting the number of passages associated with each. These themes were then organized in a chart so that they could be supported or refuted using the other data sources. The theme, segments from interview transcripts, supporting observational data, supporting artifacts, and contradicting data were all mentioned in the chart's columns.

Notes from in-person interviews were incorporated into the chart as both confirmatory and disconfirming evidence. The chart was continuously improved as new themes emerged.

Additionally, the researcher conducted a reread of all data sets on a different day to seek contradicting evidence for each teacher's case.

Finally, keyword searches were employed to test themes (per individual case) to determine whether the weight would be bolstered by the frequency with which words associated with them are used. Also, it was employed to examine the cases for parallels and divergences by attempting to identify the same words to determine how the regularities varied.

## Results and Discussion

The results and discussions of the data analysis are presented in this section. This study explores the difficulties encountered by educators in imparting mathematical concepts to students in constrained in-person classes and obtains the teachers' viewpoint on how initiatives, forums, and activities support ongoing development for efficient instruction in the event of a pandemic.

### **Pedagogical Challenges of the Teachers in Teaching Mathematics under Limited Face-to-Face Classes**

A theme—the teacher's ability to adapt teaching strategies to the new normal learning modality—captures the pedagogical challenges that educators face when attempting to teach mathematical concepts to students in constrained face-to-face classes. To develop a theme from their answers, Teachers A, B, and C were asked the same question. Regarding the pedagogical challenges, Teacher A listed important concepts. The viewpoint on metacognitive techniques comes first. He recommended that educators use metacognitive techniques to assist students becoming self-regulatory and strong learners with a strong sense of agency. Upon being questioned, Teachers B and C offered the same challenges that they had with Teacher A. Metacognitive techniques, as introduced by Teacher B, enable students to reflect on their thinking. Their control over their learning is enhanced by this understanding of the process of learning. Furthermore, it improves an individual's ability to control their motivation for learning and to practice self-regulation. He made the point that utilizing technology in the classroom can be a very effective way to differentiate instruction when teaching elementary math, which will help students in mixed-ability classrooms succeed.

*“We have this integrating mathematics in technology. So, whether in India, or our class, for example, in supply-demand topic where mathematics is involved, is to introduce it actively by technology-based learning.”*

Most virtual participants agreed with the statement. It coheres to their responses when prompted with the same question. One stated that:

*“It is important for the teacher to understand the situation of the students in the new normal. And that the teacher should always have alternative ways to teach and evaluate the students.”*

From the perspective of the participants, there were certain factors that they took into consideration when choosing the teaching strategies and tactics that would work best for the students enrolled in restricted face-to-face classes and could potentially reduce students' anxiety related to the topic and the pandemic scenario. They had difficulty implementing cooperative learning strategies into practice, which teachers regularly employed when instructing students to make sure learning occurred before a pandemic. This corresponds to research conducted by Kumar et al. (2021) on how the COVID-19 pandemic affected teaching and learning. They discovered that the new normal education will probably affect learning pedagogy, which will affect both teachers and students. Compared to the previous format, which might have placed more emphasis on in-person instruction, this calls for a methodical evaluation of the adaptation of online teaching and learning. Therefore, it is imperative to assess the learning objectives attained via virtual learning. Evidence is required regarding the viability, advantages, drawbacks, and modifiable drivers of the economic impact of the various initiatives introduced in the field of online education (as well as whether or not they are successful). Some of these might be considered for integration into courses after the pandemic ends if educators and students discover them beneficial, as opposed to being restricted to the current forced distance education scenario. Khan and colleagues (2021) underlined those modifications to the learning process had an impact on students' interactions with the instructor, other students, and the equipment they were learning to use. The small number of participants also affected learning motivation, how well students interacted with one another in practical activities, and how well students fulfilled learning objectives. Tiredness hindered not only the students but also the instructor's ability to conduct the lesson because they had to spend more time in a "COVID-19 safe" setting. Group activities were negatively impacted by COVID-19. In the classroom, there was less peer discussion and interaction due to the face masks, keeping social distance, and other COVID-19 protocols.

The second concerns the disparity in strategy implementation under constrained in-person instruction. It seemed to him that it was critical that students be made to feel at ease and allowed to pick up new mathematical concepts at their leisure, without feeling pressured. Although this is a well-known concept that "every student will learn given enough time," it can be challenging to put into practice.

*"Time constraint on remote learning makes teacher and students feel rushed into accomplishing activities given rather than learning the topic and thus gaps the metacognitive strategy implementation."*

The third emphasizes reconsidering instructional strategies in light of the modular distance learning modality. Even with distance learning, providing feedback to students is crucial to improving their performance in mathematics classes. Inform the students of their performance on a particular task and provide useful strategies for enhancing and expanding their knowledge. He recommended developing a strategic teaching plan for how to conduct the lessons even with little in-person interaction. Given that Dayagbil and colleagues (2021) noted that teachers modified their lesson plans to the institution's policies during school lockdowns, this limitation seems highly likely. Most students found it difficult to finish the required readings and learning activities because they had little or no access to the Internet.

Emerging themes from the qualitative responses encompassed the teaching and learning environment, technology's role, the trajectory for flexible learning delivery, and the importance of safety and security. This means that the pedagogies employed in the pre-pandemic teaching and learning scenario were not the same as the teachers' perspectives on pedagogy.

However, during the few face-to-face classes, Teacher B added important concepts on pedagogical challenges that might impede the teaching-learning system. The first involves creating a learning environment in a classroom. She presented practices that should be examined in the few in-person classes, such as providing space for both teachers and students and taking into consideration online resources and instructional materials when selecting different teaching pedagogies.

*“Both the teacher and the learner need space. So, in a classroom, you might be located in a space, a space where there are lots of office mates, or for the side of the students, they might have no private space. It affects the classroom environment. It affects the learning environment. So, the space is also important.”*

According to Chun et al. (2021), students in nations that have the infrastructure and resources to support distance learning are unlikely to fall behind, even though the majority of learners in those nations can continue their education. This indicates that there is a greater chance of the students falling behind, necessitating the need for intervention to lessen the situation.

Second, Teacher B discussed the significance of providing students with support at home. She said that the availability of educational resources and facilities must be a priority for parents, educators, and any other supporting organization. She additionally addressed maintaining a connection with students even when they are not in direct contact with teachers.

*“We should get connected with them because we know that they are capable and we don't have the right to overthink to overtake the way they think.”*

She underlined that it is false to believe that pupils are incapable of thinking and that they can be assisted if teachers tend to connect with them. She continued by saying that supporting the parents in aiding or facilitating their children's learning needs to be considered. Third, she discussed her thoughts on how to run small, in-person classes. One is that teachers cannot devote all of their time to helping students master the weekly competency that is being targeted, and since group projects are discouraged, collaborative learning will not take place.

According to Sarmiento et al. (2021), the reopening of schools for in-person interactions needs to be carefully planned to ensure the safety of teachers, staff, and students. This should be performed in a staged manner, particularly after physical distancing. It is necessary to review the recommended teaching methods and activities for junior high and senior high school students that can be included or excluded from restricted in-person classes while maintaining minimum health standards in light of the different face-to-face program types in other areas.

## **Teacher's Perspective on How Programs, Fora, and Activities Ensure Continuous Improvement for Effective Teaching During Pandemic**

Teachers' perspectives regarding how programs, fora, and activities given by training agencies ensure continuous improvement for effective teaching during the pandemic can be apprehended into a theme, that is, about conducting professional training development to teachers for instructional improvement on various modalities under new normal learning modality. Instructor C identified important ideas about ongoing development. He outlined four obligations for teachers, one of which is to pursue continuous professional development for their personal growth through formal education. Teacher C provided some concerns he had about the justification for adopting continuous improvement in the context of the swift changes in education. Math teaching is entirely dependent on teachers' professional development and experience, and they negotiate from one important development area into another to ensure continuous improvement. The roles of teachers have improved, proceeding from in-person instruction to remote learning; we have an internal understanding of how to improve our instruction to fit the situation because of the demands set by the educational system. Teacher B emphasized that not all educators are dedicating their time to embrace ongoing development. However, she also mentioned that educators ought to attend more pertinent workshops and training sessions on blended learning, remote learning, and sparse in-person instruction. Chun, et. al (2021) emphasized that many people said they didn't have the pedagogical or digital skills they needed to deliver distance learning.

Teacher C discussed the value of improving professional engagement by engaging in graduate studies. He mentioned that

*"...you are going to learn what is new ... in the PhD wherein, we allowed our, our learnings to be processed by extending services to, in this case, the student, my students."*

By applying new knowledge in the field and providing services to students, he meant that continuing professional development could be a benefit of pursuing graduate studies. Finally, teacher C emphasized the importance of providing teacher participants with training on pedagogical practices and allowing them to conduct action research after implementation. One virtual participant offered the notion that teachers can enhance their research-based practices by attending pertinent training. Teacher A went on to say that it would be to use the knowledge obtained from master's and doctoral degrees to improve instruction and provide better services to students. According to Singh and colleagues (2021), training and professional development could be helpful for them to succeed. Well-prepared instructors will contribute to the process of developing courses that will ultimately improve the learning environment for students. According to the participants, the majority of the training concentrated on preparing teachers to teach online, even though most Philippine schools could only offer modular distance learning due to a lack of funding. It is essential to concentrate on faculty capacity building so that they can become more knowledgeable about e-learning resources, online teaching strategies, and cutting-edge technology applications for teaching and learning. This implies that educators need to know ahead of time what needs to be performed to facilitate remote learning. Better results in modality implementation will



come from arming teachers with the knowledge and skills necessary for the kind of modality they were using during their training. Instructors who receive the training required to apply a particular modality are better equipped to handle cases that arise during and even after a pandemic.

### **Conclusion**

Pedagogical strategies received little attention, in part because the majority of Philippine schools used modular distance learning as a modality. Therefore, action must be taken to lessen this situation. Reviewing the effects of MLS, which is used constantly even during the pandemic, is necessary. It is essential to evaluate the learning objectives attained through online instruction. Evidence is required to support the viability, benefits, downsides, and modifiable economic impact of the various online education initiatives (as well as their efficacy). Some of these might be taken into consideration for integration into courses after the pandemic ends if educators and students find them beneficial, as opposed to being restricted to the current forced distance education scenario. It is necessary to review the recommended teaching methods and activities for junior high and senior high school students that can be included or excluded from restricted in-person classes while maintaining minimum health standards in light of the different face-to-face programs offered in other regions. According to this research, when these pedagogies are used, the effects on stress and potential burnout need to be carefully tracked, investigated, and evaluated to create policies that work. This study additionally established the case for the need for a workshop or training where educators could practice remote learning techniques.

The majority of the training was about equipment for online teachers yet the majority of the schools in the Philippines offered modular distance learning modality. Educators must receive pertinent training that aligns with the modality to which they are assigned. Examples of such training encompass how to effectively manage students remotely, assist students with implementation barriers, ensure authentic learning experiences through assessment, and train parents to participate as home learning facilitators. The difficulties experienced during the pandemic should be compared to those encountered during the few face-to-face classes, even though teachers were less prepared with pedagogical strategies for the students under the modular distance learning modality. Building faculty capacity is essential to preparing educators to work with students in post-pandemic teaching and learning environments. This will lessen the burnout and challenging issues for teachers while stressing themselves perceived as unskilled to handle limited face-to-face classes.

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