Narrative Study of Teaching Strategies and Challenges Encountered by Teachers in Synchronous Online Classes

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ABSTRACT

The COVID-19 pandemic urged a dramatic shift in the educational landscape, whereby digital platforms are utilized in teaching and learning. This new setup has posed challenges in teaching mathematics; hence, this study was conceptualized to explore the different teaching strategies and challenges math teachers encountered in their synchronous online classes (SOC). It aimed to draw analysis and increased understanding of the experiences related to teaching strategies and challenges, focusing on two essential aspects of teaching and learning: content and student engagement. Online in-depth interviews involving nine (9) Junior High School mathematics teachers of a private academic institution in Southern Luzon were conducted for data gathering. Results depict two significant themes as the participants' strategies in their SOC: teacher-directed instruction and motivational strategies.Meanwhile, three major themes emerged as challenges encountered by the participants: the role of the teacher, time constraints, and students' responsiveness. Findings suggest that some of the difficulties in synchronous online teaching may have resulted from the tendency to replicate face-to-face teaching in a virtual classroom and lack of technological proficiency. Hence, opportunities to enhance teachers' knowledge and skills in digital pedagogies and more student-centered online teaching approaches can be a gateway to address the challenges posed.

Keywords:

COVID-19; Online; Strategies; Synchronous.

ABSTRAK

Pandemi COVID-19 mendesak perubahan dramatis dalam lanskap pendidikan, di mana platform digital digunakan dalam proses belajar mengajar. Pengaturan baru ini telah menimbulkan tantangan dalam mengajar matematika; Oleh karena itu, penelitian ini dikonsep untuk mengeksplorasi berbagai strategi pengajaran dan tantangan yang dihadapi oleh guru matematika di kelas sinkron online (SOC). Ini bertujuan untuk menarik analisis dan meningkatkan pemahaman tentang pengalaman yang terkait dengan strategi dan tantangan pengajaran, dengan fokus pada dua aspek penting dari pengajaran dan pembelajaran: konten dan keterlibatan siswa. Wawancara online mendalam yang melibatkan sembilan (9) guru matematika SMP dari lembaga akademik swasta di Luzon Selatan dilakukan untuk pengumpulan data. Hasilnya menggambarkan dua tema utama sebagai strategi peserta dalam SOC mereka: instruksi yang diarahkan guru dan strategi motivasi. Sementara itu, tiga tema besar muncul sebagai tantangan yang dihadapi peserta: peran guru, keterbatasan waktu, dan daya tanggap siswa. Temuan menunjukkan bahwa beberapa tantangan dalam pengajaran online sinkron dapat dihasilkan dari kece-nderungan untuk meniru pengajaran tatap muka di kelas virtual dan kurangnya kemahiran teknologi. Oleh karena itu, peluang untuk meningkatkan pengetahuan dan keterampilan guru dalam pedagogi digital dan pendekatan pengajaran online yang lebih berpusat pada siswa dapat menjadi pintu gerbang untuk mengatasi tantangan yang ditimbulkan.

Kata Kunci:

COVID-19; Online; Strategi; Sinkronis.

1. Introduction

The propensity for continuous education amidst the COVID-19 pandemic has dramatically changed the Philippines' delivery of instruction. In response, private and public schools have adopted various teaching-learning modalities as part of the Learning Continuity Plan, such as face-to-face, blended learning, distance learning, and home-schooling (Department of Education, 2020). Of the distance learning modalities offered, one of the preferred options, especially for private schools, is an online modality or e-learning— an education over the internet. Online learning "features the teacher as facilitator, engaging students' active participation using various technologies accessed through the internet while they are geographically remote from each other during instruction" (DepEd Order No. 012, s. 2020).

Student-teacher interactions in online learning delivery may be synchronous or asynchronous. Synchronous learning happens when the teacher and students gather in an online

space like a video conference and work together in real-time. In contrast, asynchronous learning is when students individually work on their learning activities at their convenient times. This new modality requires the teachers to adapt instructional changes in delivering education to their students.

Teachers indisputably play a crucial role in online education (Sun & Chen, 2016). Aside from developing well-designed course content, they are also at the forefront of applying various instructional methods that appeal to multiple learning styles and build an interactive and cohesive learning environment. Several studies have shown teachers' experiences in the online teaching setup. Common online teaching strategies and tools described in the literature are web technologies, online discussions and demonstrations, feedback, and strategies that foster interaction and interaction between teacher and students and among students.

Online discussion and demonstration are common pedagogic approaches in online teaching (Gemmell et al., 2011; Yang, 2017) despite growing evidence that constructivist and collaborative approaches are effective in online and offline classes (Gallant, 2020). Interaction between the students and the instructor is key to effective online instruction. Interaction among students is crucial as a venue for students to share knowledge, accomplish common goals, increase performance and satisfaction, and receive support and help from their peers (Sun & Chen, 2016). Additionally, providing appropriate feedback is an essential online instructional strategy that positively influences student motivation and increases student sense of the online learning community (Li et al., 2019).

Meanwhile, various challenges in online education were found by several researchers, with student engagement and instructional strategies being common concerns. Farmer and West (2019) explored online K-12 teachers' concerns and found out through an interpretative phenomenological analysis that the years in teaching do not affect the development of relations. As expounded, part of online teachers' concerns is how to engage their students in online teaching-learning processes. Kebritchi, Lipschuetz & Santiague (2017) also identified students' participation and engagement as an issue that online educators must recognize and support. Besides, they pointed out three significant categories concerning delivering online courses: content development, students, and instructors. Moreover, it was emphasized that the instructor's changing role must also be addressed, which relates to the challenge of shifting what is taught in the face-to-face classroom to online.

Similarly, Lukenchuk (2016) identified student engagement as a challenge to online teaching and redefining concepts, communication, and interaction. Indeed, student engagement is vital for teaching and learning processes, whether face-to-face or online (Perrotta & Bohan, 2020; Correia et al., 2019; Kyei-Blankson, Ntuli, & Donnelly, 2016). As such, some strategies that influence student engagement are worth noting. Student motivation is one of the affective factors influence student engagement (Gray & DiLoreto, 2016). Praising students

increases student motivation to keep learning, and if appropriately given, it positively influences student engagement (Firdaus, 2015). Hence, teachers may consider designing the lessons and activities that encourage active student participation in their learning experiences.

Instructional concerns are also common in online teaching (Farmer & West, 2019), including technology-pedagogy-related concerns (Herodotou et al., 2019). Before the pandemic, fully online learning was not a standard modality in Philippine primary education. The drastic shift from face-to-face to fully online modality is assumed to bring about many challenges, especially in subjects traditionally perceived to be best taught in a face-to-face setup, like Mathematics. Some studies suggest that teaching math online at the tertiary level is not as effective as teaching it face-to-face (Trenholm, Peschke, & Chinnappan, 2019; Vilardi & Rice, 2014). In addition, teaching math online is perceived to be challenging (Lokken & Mullins, 2014, in Trenholm & Peschke, 2020). Nevertheless, some studies have seen the potential of teaching mathematics online as an opportunity to drive pedagogical innovation that will benefit the students (Borba et al., 2016; Trenholm, Alcock, & Robinson, 2016; Guerrero, 2020). Some studies have explored math teachers' online pedagogical practices and found that Math teachers who experienced shifting from face-to-face to online teaching highlighted the need to change in designing and organizing activities and tasks to be more effective in online delivery (Huang & Manouchehri, 2019). This includes the need for more collaborative activities (McCombs, 2015; Wen-Chi, Chen Hsieh, & Yang, 2017) and appropriate online resources (Yang, 2017; Gemmell et al., 2011).

Indeed, certain aspects must be looked into for an online teaching experience to thrive. Hence, this study focuses on the teaching strategies that online math teachers employed and the challenges they encountered in content and student engagement. While the previous studies focused on online teaching in general, this study focuses only on Mathematics teachers' teaching strategies and challenges encountered in synchronous online classes (SOC).

2.   Methods

This study utilized a narrative approach to narrating the teaching strategies employed by math teachers and their challenges during SOC regarding content and student engagement. Cowger and Tritz (2019) describe this type of research as incorporating experiences and acknowledging a constant change in learning. It serves as a venue for the participants to expand their knowledge through their own words to explain their experiences.

To capture the detailed life experiences, one or a small number of individuals is required for a narrative study (Creswell & Poth, 2018). Hence, the study participants were nine (9) secondary mathematics teachers from a private school in Southern Luzon who were selected through purposive sampling and agreed to participate in this study. The participants were eight females and one male who have been teaching mathematics in Grades 7, 8, 9, and 10 for at least eight years. All

participants have no experience of online teaching before the pandemic.

A researcher-made interview guide containing open-ended questions about the teaching strategies was employed, and challenges encountered by math teachers related to content and student engagement were used. The interview guide comprised of twelve open-ended questions was carefully formulated and validated by a research expert. In gathering data, a letter of request to conduct the study was sent to the school head, and the approval of the school's Ethics Review committee was sought afterward. One-on-one in-depth online interviews were conducted through google meet at the participants' preferred time. Moreover, it was ensured that all participants received adequate information regarding the study by reading and agreeing to the informed consent form. Permission to record the interview was also sought from them.

Open coding was used in organizing and analyzing the gathered data necessary for generating themes. After completing all interviews and transcribing them accordingly, a list of available codes was established and organized into common categories or reoccurring themes. Moreover, a selective phase of sorting and combining initial principles was conducted to have a more concise and uncomplicated list to develop the study's theoretical direction. A careful analysis was made to ensure that the data interpretation would result in a faithful account of the participants' narratives.

3.   Results and Discussion

3.1   *Teaching strategies of Math teachers in their synchronous online class*

The first research question addressed the teaching strategies employed by math teachers in their SOC, particularly in delivering the course content and engaging their students. Analysis of the participants' narrative yielded two significant themes: Teacher-directed instruction and Motivational strategies.

3.1.1. Teacher-directed Instruction

In their SOC, the participants' teaching strategies are discussion or demonstration, online interactive activities, question-answer method, giving feedback, and flipped classroom. These strategies were categorized as teacher-directed instruction as. Seifer & Sutton (2021) defined teacher-directed instruction as any strategies initiated and guided by the teachers, including lecturing, explaining, involving, and encouraging students to participate actively.

All participants reported conducting SOC through google meet for an hour per week. Their synchronous class is divided into structured synchronous video conference (SSVC) and unstructured synchronous video conference (USVC). The SSVC is an online session in which teachers and their students meet for their lesson proper, whereas in USVC, students are given a chance to ask questions or clarify misconceptions about the classes in the online modules. Since it

is unstructured, there is no particular topic discussed during the session.

According to the participants, the lessons they have in their SOC were based on the competencies provided by the Department of Education. Because they teach at different grade levels, topics vary from one grade level to another: geometric, quadratic, variation, and algebra.

The majority of the participants (P1, P3, P4, P5, P6, P7, P9) discussed and demonstrated with a PowerPoint presentation (PPT) in delivering math lesson content in their online classes, including samples of math problems and solutions. Participants discussed their lesson using PPT, and through animation, the solution for a particular situation is shown step-by-step. As shared;

"For a particular topic, I used to have three examples. I discuss one example and demonstrate how to do or solve it, especially now that we discuss how to graph. I will discuss the first example; then I will ask my students to answer the two remaining examples" (P1).

One participant unfolded that a PPT with pen feature is helpful to address students' questions as the teacher can scribble the solution using the school-provided graphic tablet. Moreover, some participants use physical or virtual whiteboards to demonstrate to their students how to solve more sample math problems (P5, P7, P8).

Although all participants were relatively new to synchronous online teaching, they looked for and used educational applications like *Quizizz, Quizalize,* and *Kahoot!* for formative assessments such as interactive online activities, practice drills, and quizzes (P5, P6). As mentioned by P5, "*Sometimes I give short online activities. Quizalize or Kahoot. At the end of the discussion, I give them drills for me to know if they understand.*" Participants perceived these online applications as helpful in monitoring and assessing their students because they provide real-time feedback. Providing immediate feedback is necessarily better to evaluate student learning. Moreover, Kahoot!,

A game-based student response system enriches student learning and experiences in the classroom as it fosters classroom dynamics, motivation, and engagement (Licorish et al., 2018). Further, interactive activities are deemed helpful in assessing student learning and understanding. *"Maybe having more activities with interaction, especially when having practice exercises because there will be interaction among the students. I could assess if they learn or understand the lesson" (P9).*

Four participants (P1, P2, P3, P4) mentioned that they were practicing the question-answer method in their online classes to involve their students and assess student learning and ability to graph or solve a particular math problem. The question-answer strategy increases students' attention and motivates students' thinking (Shanmugavelu et al., 2020). As narrated;

> *"Mostly in my class, I use the art of questioning. Even probing the questions whether they really know the answer or not. For example, in the topic System of Linear Inequalities, if they really know how to graph or if they can solve the given problem"* (P3).

One of the participants (P7) recounted feedbacking as an effective strategy. *"For me, it's feedbacking. With the situation that we have, the students rely too much on your feedback. They are always going to wait for that. And you will see the improvement in their output based on the feedback that you have given them."* Providing appropriate feedback is an essential online instructional strategy as it can positively influence student motivation and increase student sense of the online learning community (Li et al., 2019).

The most unique teaching strategy among the participants is the flipped classroom approach. Instead of having a proper lesson delivery in the SOC like other participants, P8 supplements or follow-up students' learnings from their modules in their asynchronous class in their respective LMS platform. As mentioned;

> *"Since we follow an online setup, Border free Learning Management Platform, then also self-paced design, so I just make a follow-up on what they have learned from the modules that we are providing them through Canvas, through our LMS, then deepening and emphasizing important points happen during video conferences. Then I usually use online applications. That is what sustains student interest. I offer interactive activities, emphasizing important points and concepts, particularly graphing, so I use an open board and whiteboard. Though I'm not that well-versed, so while I'm using the application, so we are discovering the other features altogether with the class"* (P8).

3.1.2. Motivational Strategies

Student engagement is vital for the teaching and learning processes in a face-to-face or online class (Perrotta & Bohan, 2020; Correia et al., 2019; Kyei-Blankson et al., 2016). Undoubtedly, part of online teachers' concerns is how to engage their students in online teaching-learning processes (Farmer & West, 2019). Student motivation is one of the affective factors influencing student engagement (Gray & DiLoreto, 2016). Different motivational strategies to engage students during SOC were recounted: *randomly calling students, praising students, encouraging students, checking attendance, and game-based activities.*

As narrated by the participants, they use different motivational strategies to ensure student engagement and participation during their online classes. To make students attentive, participative, and alert, most participants (P1, P3, P4, P5, P6, P7, P9) practice random calling of names during their SOC, one of them makes use of *'random name picker.'* As narrated;

"So what I did now to ensure that everyone will participate, I am using two gadgets. The laptop is for my presentation, while the cellphone is where I will see who is present, who is raising their hand, and for those who don't have a microphone or whose mic is not working, they use the chatbot to answer the questions. On the cell phone, I will see, this student answered, that student responded. That's also what I use for roll calls. I see to it that I get to call each student." (P7).

"Lately, since I noticed that only a few of the same students are participating, I used the app 'random name picker' to give everyone the chance to answer, so not only are randomly answering or the same students are answering. Others are given the prompt to answer, so they are not just listening. I have first the attendance, then I copy and paste it in the "random name picker " (P1).

Two participants (P2, P5) used praising or giving commendation to uplift and motivate their students to be engaged during the online discussion, as declared by P5, "S*ometimes I give a commendation. I praise them."* Praising students increases student motivation to keep learning, and if appropriately given, it positively influences student engagement (Firdaus, 2015).

Another motivational strategy the participants use to ensure student engagement is encouraging their students to participate. As stated;

"Not all [turn on their cameras], but I do not force them anymore. I encourage them definitely, but I understand their side. I understand their point why they do not want to open the cameras. I respect their decision of not opening that, as long as they can still participate. Some are answering in the chatbox. So I appreciate that. Some are turning on their microphones. I also appreciate that. That's okay" (P8).

Another participant shared that teachers need more preparation in online teaching to encourage students to understand.

"Oh! Teaching online is difficult. Before in face-to-face, even I entered the classroom with no book, I could teach everything. It was easy. Now, I need more preparation to encourage students to make them understand what they want to understand" (P2).

Teachers may consider designing the lessons and activities that encourage active student participation in their learning experiences (Gray & DiLoreto, 2016) and a learning community. Encouraging students to participate in a learning community actively is essential for the success of online student learning (Sun & Chen, 2016).

Three participants deemed checking attendance to motivate students to attend and participate in SOC. As mentioned, attending SOC is not compulsory for the students and is not graded. However, some participants check student attendance despite not being graded

and not mandatory. As stated:

> *"First, I am asking them to sign in the attendance form. We have that so that they will be encouraged. I am showing them that I really check their attendance for their participation in that SSVC. And then I am also letting them, for example, to ensure that they are really participating." (P3).*

> *"Attendance-wise, it is okay. There is always more than half [of the class] during structured, so it is fun in Grade 7. Generally, in all my classes, there are always many attendees." (P7).*

> *"I am changing my routine. Sometimes I check the attendance first, sometimes at the end [of the class]. Or sometimes there is an exit ticket that serves as their attendance)" (P4).*

Notably, one participant considered game-based activity an effective strategy to foster students' active participation during SOC as they find it enjoyable. As articulated;

> *"Actually, I am also teaching in Grade 7, I am handling two Grade 7 classes. In the lower level, Grade 7, students were having fun with games. For example, they are racing to answer practice drill activity. They are having fun with it [games] or with those optical illusions" (P6).*

Incorporating game-based learning or gamification in educational activity engages students in actively participating in their learning process and improving student performance (Smiderle et al., 2020).

3.2. Challenges encountered by Math teachers in the synchronous online class

To identify the challenges that teachers encounter in their conduct of SOC, the participants were asked what they think and feel about teaching the content online and what they find exciting or challenging. In terms of student engagement, they were asked if they find any difficulty engaging the students and how they address such. Three major themes emerged: *the role of the teacher, time constraints, and students' responsiveness.*

3.2.1. Role of the Teacher

Analogous to what Kebritchi et al. (2017) emphasized, the present study realized that the teachers' changing role in shifting from the face-to-face classroom to the online learning setup is a concern that must be addressed.

Participants described their experiences in preparing the lessons as "*tasky, difficult, and challenging*" due to the many references and applications that have to be prepared beforehand.

One participant (P1) pointed out that since math lessons require many explanations, the videos are not enough to explain everything about the classes. The participants shared that their concern is not on the content but on how it will be taught (P2, P4, P6, P7). For instance, the participant (P2), having 28 years of math teaching experience, compared their face-to-face teaching experience. Their mastery of the lessons enables them to teach the content despite having less preparation time. P2 shared that they need to have more teaching online preparations to encourage their students and further understand the lesson. P2 cited a particular situation when teaching about graphs [in Algebra]; they would draw it on the board, which is quite challenging since they admit that they are not technologically adept.

> *"It is difficult on the part of the teacher. It is also difficult on the part of the students. Like for example, when you are teaching about graphs, it would be easy to draw it on the board [in the face-to-face class]. It is difficult to show it to the students [in online class] especially if I am not technologically-adept" (P2).*

This coincides with the sharing of P8 as follows:

> *"Another thing that can be considered a challenge is we have to learn the pedagogy of technology. We have to be well-versed with the different online applications, then thorough preparation and exploration of this online app."*

Gauging and monitoring students' learning is another issue mentioned. Some participants shared that checking and monitoring the students' answers to practice drills and assessments is challenging (P1, P5). Having prolonged exposure to the laptop screen concerns one participant (P1), which compared how they would check papers during face-to-face teaching. Another participant (P5) had thoughts on whether students really grasp or understand the lessons being taught due to limited practice drills and could not even monitor if the students take time to answer such. With regards to the monitoring of students, one participant (P7) expressed their thoughts:

> *"That is one difficult part of online because I really cannot monitor the progress of the student. I don't know who can catch up with the lesson or is struggling with the content. I could not see that unless they themselves schedule an appointment. But very few of the students would be asking me questions like, 'Miss, how is this done? I could not understand.' There are very few of them, but I know that there are students who really struggle. Imagine, even in the face-to-face there are really those who struggle, academically challenged, but in this setup, I could not gauge the ability of the student. I only see it during synchronous conference, based on who are active, but for the rest it's difficult. So I also do not know who to help."*

Another challenge identified is providing feedback, as one participant (P7) shared that simultaneously addressing the questions is impossible if students have the same questions or concerns. Thus, P7 would spend time responding to students' queries through Canvas inbox.

Sometimes scheduling a conference with the students for their problems takes a lot of time. Yet P7 initiated doing so; hence, there were many consultations with the students during the school year's first quarter. As mentioned;

> *"When it comes to providing feedback, you will find out that there are students who have the same concerns, but since they are self-paced, I could not have them work at the same [pace]. As much as I want to gather them, those who have the same concerns can attend my meeting on this date. I could not do it because it's self-paced. They've different [pacing]. That's why I see to it that when they have questions, I try within 24 hours, I try to answer their question. Because I'm not too fond of the feeling of anxiety, the student may be apprehensive, thinking while waiting for a response. So giving them feedback is what I find most challenging. I spend most of my time answering their queries and responding to the Inbox comments. Most of my time is spent there. Then sometimes, when the concern takes a lot of time, I schedule a conference right away. I initiate it. During the first quarter I had a lot of conferences, consultation" (P7).*

However, the participants find ways to encourage their students by sending messages through Canvas inbox (P1, P3, P4, P8), reminding them of the importance of attending the SOC. Sometimes, P4 would also ask other members of the class to remind the course to participate in, as emphasized;

> *"I am sending messages or reminders through Canvas inbox, reminding them how important it is to attend the SSVC or USVC. I am also asking for the help of the members of the class. For example, just like this afternoon, I had my make-up class" (P4).*

Participants' narratives signified their new and different role as teachers as they shifted to online teaching. It can be inferred that their new experiences made them think more about how to respond to a particular challenge.

3.2.2. Time constraints

Meanwhile, some participants (P1, P4, P8) shared that time constraint is a challenge they faced when conducting synchronous sessions as they have limited time to discuss the lessons. They also associated time management concerns when they are preparing online modules. One participant stressed that the busy schedule somehow lessens her time to prepare for online activities.

3.2.3. Students' Responsiveness

The following concerns related to students' responsiveness correspond to one of the arguments presented in Sun and Chen's (2016) study, wherein the interaction between the

students and the instructor is emphasized as key to effective online instruction.

Students' participation and attendance are two factors that the participants perceived as another challenge in synchronous teaching associated with students' responsiveness. All the participants shared their feelings regarding the students' inactive participation. According to them, there are times when students would be asked to turn on their camera, but to no avail. Some participants also shared that very few students participate during discussions and would not even react when their names are called. P4 shared the difficulty of encouraging students to participate, particularly when the students are not responding. This coincides with what P7 shared about the video conference with the class, P7 felt alone because no one else was talking, and it seemed that students were just observing.

Seemingly, the participants considered that more teacher-students collaboration can be fostered if students turn on their cameras during online discussions. However, this contradicts the findings of Gherhes, Simon & Para (2021) that students disagree with keeping their webcam on during online classes due to anxiety, shyness, and ensuring privacy. They are more attentive to what they are doing but that it is much more comfortable for them to keep the video camera closed.

Moreover, the participants narrated the number of students who attend during SOC. According to P2 and P4, there are times when only half of the class would accompany the video conference, and the number continues to decline as days go by. Teachers find it a challenge to motivate students to attend. However, based on one participant's sharing, students' non-attendance in the SOC does not mean that they are not doing well in the subject. As explained;

> *"They're just having problems in attending SVCs, but most of them are on schedule in accomplishing module requirements. Maybe they can already manage, or maybe they were able to adjust with our setup, they don't need the guidance of the teacher, or maybe they just approach me through emails or sending a message through Canvas inbox"* (P8).

This agrees with another participant.

> *"Actually, I recently had a conversation with a parent who was worrying about her child, wondering why her child would not do his tasks. Then he shared that her child is a night-person, meaning he would sleep at day and do his tasks from night 'til dawn. That student always does his Formative Assessments, but the parent was wondering why her child does not attend SVC"* (P4).

Although some participants were concerned with the attendance, some asserted that students' attendance at SOC might not hinder their online class performance.

4. Conclusion

Participant narratives revealed that there is indeed a two-way relationship in the teaching strategies and the challenges teachers encounter during synchronous online teaching. Some challenges emerged from the use (or the lack) of specific teaching strategies. Conversely, certain teaching strategies are utilized to address identified challenges. Ultimately, it can be inferred that some of the challenges that participants faced in synchronous online teaching may have resulted from the tendency to replicate face-to-face teaching in a virtual classroom and from the lack of technological proficiency. As such, opportunities to enhance their knowledge and skills in digital pedagogies and more student-centered online teaching approaches can be a gateway to address the challenges posed. To address the identified challenges of mathematics teachers in synchronous online teaching, teachers need to acknowledge that there may be more appropriate teaching strategies for a SOC other than those utilized in a face-to-face environment and be more mindful of digital pedagogies. This may be catalyzed if teachers have a robust training program on digital pedagogies and student-centered online teaching. When teachers are equipped with the necessary knowledge and skills, they will be empowered to shift their pedagogies and address the challenges they have identified in more creative ways.

As there is minimal literature on synchronous online mathematics teaching in primary education in the Philippine context, this paper may contribute to this body of knowledge. However, this study's results may not necessarily represent the experiences of other math teachers delivering online instruction, more so of teachers of different disciplines teaching in the same modality. Hence, further studies are recommended to heighten educators' and policy makers' awareness and provide them with more in-depth insights into necessary reforms to transition to this new standard education delivery model.

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