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The Post-Pandemic Era in Education: Adaptation and Continuity of Distance Learning in Mathematics Teaching in the Division of Antipolo City, Philippines

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A B S T R A C T

Even though the pandemic has ended and face-to-face classes have resumed as the primary mode of instruction across the country, distance learning remains prevalent. Many schools and students continue to rely on distance learning for various reasons, such as the need for flexibility, lingering public health concerns, natural calamities, and other factors. This indicates the importance of continuously assessing the implementation of distance learning modalities in schools, even after the pandemic. This ensures that mathematics teachers' practices are adapted to the current context, learners remain engaged despite the distance, and assessments are conducted validly and reliably. This qualitative study aimed to analyze the experiences, challenges, and coping strategies of eight selected mathematics teachers from two public schools, one school per district, in the Division of Antipolo City, Philippines. The focus was on their ongoing adaptation to alternative learning delivery modalities (ALDM) in teaching mathematics at the secondary level. The study conducted an in-depth analysis of these experiences, challenges, and strategies. Findings suggest that implementing ALDM in mathematics teaching is still a viable tool to ensure the continuity of learning despite any disruptions, although its success depends on the type of learner. The study highlighted the importance of preparation, indicating that both teachers and learners need to be adequately prepared for the transition to distance learning. These results served as a basis for proposing a plan to support not only the teachers but also the students and their respective schools in effectively teaching mathematics during the implementation of ALDM.

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RESUMO

Embora a pandemia tenha terminado e as aulas presenciais tenham sido retomadas como principal modo de ensino em todo o país, a aprendizagem a distância continua sendo prevalente. Muitas escolas e estudantes ainda dependem da aprendizagem a distância por diversos motivos, como a necessidade de flexibilidade, preocupações persistentes com a saúde pública, calamidades naturais e outros fatores. Isso indica a importância de avaliar continuamente a implementação das modalidades de ensino a distância nas escolas, mesmo após a pandemia. Isso garante que as práticas dos professores de matemática sejam adaptadas ao contexto atual, que os alunos permaneçam engajados apesar da distância e que as avaliações sejam realizadas de forma válida e confiável. Este estudo qualitativo teve como objetivo analisar as experiências, desafios e estratégias de enfrentamento de oito professores de matemática selecionados, de duas escolas públicas — uma escola por distrito — na Divisão da Cidade de Antipolo, Filipinas. O foco foi sua adaptação contínua às modalidades alternativas de entrega de aprendizagem (MAEA) no ensino de matemática no nível secundário. O estudo realizou uma análise aprofundada dessas experiências, desafios e estratégias. Os resultados sugerem que a implementação das MAEA no ensino da matemática ainda é uma ferramenta viável para garantir a continuidade da aprendizagem, apesar de quaisquer interrupções, embora seu sucesso dependa do tipo de aluno. O estudo destacou a importância da preparação, indicando que tanto os professores quanto os alunos precisam estar devidamente preparados para a transição para o ensino a distância. Esses resultados serviram de base para a proposição de um plano de apoio não apenas aos professores, mas também aos alunos e suas respectivas escolas na efetiva condução do ensino de matemática durante a implementação das MAEA.

Keywords:
plano de ação, modalidade alternativa de oferta de aprendizagem, ensino remoto

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Introduction

Engaging in the practice of teaching entails interaction with students to facilitate their comprehension and application of concepts, procedures, and knowledge (Assey & Babyegeya, 2022). This interaction is crucial to maintaining a healthy learning community, as it fosters a sense of connection and engagement among students and teachers (Salta et al., 2021). Regular communication and collaboration help ensure that students feel supported and motivated, which is essential for their academic success and overall well-being. However, during times when the learning process is disrupted by natural disasters, emergencies, or other uncontrollable events, maintaining regular interactions between teachers and students becomes impossible. These situations can severely impact the continuity of education, making it challenging to uphold the standard learning environment. Thus, the implementation of distance learning, which gained prominence in the Philippines during the height of COVID-19 pandemic, has become a highly effective way to ensure that education continues regardless of any unforeseen events.

At present, distance learning is continuously growing as a supplementary approach in teaching at various academic institutions, offering much more flexibility than traditional methods (Phipps et al., 1998). Through this approach, teachers can still provide instructions to and receive feedback from learners despite any hindrances between them. They can utilize various kinds of distance learning modalities like Online Distance Learning (ODL), which leverages internet-based platforms for real-time or asynchronous instruction; Printed Modular Distance Learning (PMDL), which involves the distribution of printed learning materials for independent study, especially useful in areas with limited internet access; Blended Learning (BL), which incorporates face-to-face interaction with other components of distance learning to provide a more flexible experience; and Hybrid Learning (HL), which integrates various instructional methods and technologies to support both in-person and remote learners simultaneously. The choice of modality often depends on the technological infrastructure, accessibility, and socio-economic context of the community in which the educators and learners are situated, ensuring that the approach remains inclusive and responsive to local realities (Gaba et al., 2021; Cajurao et al., 2023). Even though the pandemic is now manageable and face-to-face teaching is resuming, the pre-existing distance learning modalities remain valuable for unexpected class disruptions, especially since the Philippines is very prone to natural calamities. Additionally, due to the shift in the school calendar, public schools were required to have modular or online classes during the dry season, as it made teaching and learning very challenging to conduct in schools. While this approach has its advantages, there are still areas of opportunity in its implementation that need to be addressed. One significant challenge, which was evident during the pandemic, is the appropriateness of this teaching and learning method for certain subjects, such as Mathematics (Combo et al., 2022).

Mathematics is an abstract subject; thus, effective teaching plays a crucial role in transferring and acquiring knowledge, regardless of the modality utilized. Despite efforts to ensure that mathematics is taught effectively, some challenges have emerged, including teachers' preparedness to adopt distance learning as an alternative when class disruptions occur. In this regard, most teachers, especially those assigned to far-flung areas with poor internet connectivity, depend on lesson delivery through the modules (Balasabas, 2024) provided by the Department of Education (DepEd). This becomes a challenge for mathematics teachers since the majority of the concepts included in the curriculum require demonstration and drills with their guidance, which cannot be done if they only provide modules to their learners. Hence, a second problem arises, concerning how students learn mathematical concepts in these situations. If teachers lack preparation for teaching remotely, so do the students. Many students struggle to grasp mathematical concepts and acquire the necessary skills independently.

While the DepEd suggests that parents can act as para-teachers, not all parents are knowledgeable about mathematics concepts, especially those taught in junior high school (JHS) or senior high school (SHS), and most do not have the time to teach their children. Another problem that stems from the aforementioned issues is assessment. Conducting assessments in mathematics is as valuable as teaching and learning the subject, as it provides both learners and mathematics teachers with insights into areas of opportunity throughout the process. Since students complete their tasks remotely, teachers find it difficult to verify the validity of students' outputs, which decreases the credibility of the assessment results.

Teaching, learning, and assessment are essential elements that underpin the successful application of constructive alignment in the classroom. By aligning these three facets, educators can design educational experiences that are well-structured, purposeful, and effective in meeting the intended learning outcomes (Biggs, 1996). Assey and Babyegeya (2022) emphasized that teaching, learning, and assessment are closely interconnected, influencing how educators make informed and relevant decisions, as each component provides critical insights that shape and refine educational practices.

This approach, when applied to the unique challenges of distance learning, has the potential to significantly improve the current situation. It can promote a comprehensive understanding of the subject matter and enhance the overall educational experience for students, even in the face of disruptions such as poor internet connectivity (Mintii et al., 2021), lack of parental support (Hornby & Lafaele, 2011), and, most commonly, natural calamities (Cueto & Agaton, 2021).

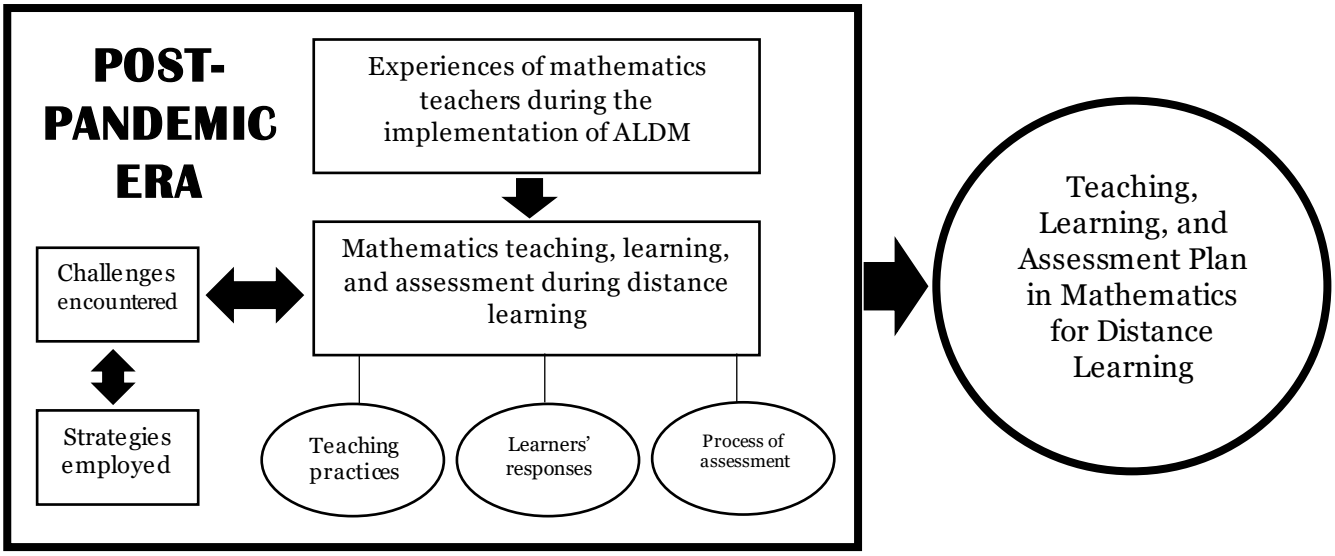
This potential for improvement is what drives this research toward developing a comprehensive teaching, learning, and assessment plan for distance learning in mathematics. It analyzes the experiences and challenges faced by mathematics teachers, along with the strategies they employed in implementing the Alternative Learning Delivery Modality (ALDM)

in the post-pandemic era. Furthermore, this study assumed that implementing distance learning modalities in mathematics teaching could still be a viable tool to ensure continuity of learning despite any disruptions, as long as both teachers and learners are prepared, engaged, and guided by a plan. In distance learning, the preparedness and level of engagement of both teachers and students are essential factors for its effective implementation (Salman et al., 2024). Additionally, developing an action plan as a guide could be beneficial for both teachers and students, especially in monitoring the effectiveness of the distance learning modalities in teaching mathematics (Combo et al., 2022).

Figure 1 depicts the conceptual framework for developing the teaching, learning, and assessment plan for distance learning in the post-pandemic era. The analyzed narratives of the participants regarding their personal experiences, challenges, and strategies for the continued implementation of distance learning modalities, in terms of teaching practices, learners' responses, and the assessment process, were the primary foundation of the entire research process.

Figure 1.

Conceptual framework of the study on the adaptation and continuous implementation of distance learning in mathematics teaching in the Division of Antipolo City, Philippines



Literature Review

Some people may not be aware that distance learning was established a long time ago, even before the pandemic of 2019. It initially began with correspondence courses in Europe, where students and instructors exchanged educational materials through the postal service (Sherry, 1995). This method allowed learners to study at their own pace and from remote locations, making education more accessible. Correspondence courses remained the primary mode of distance education until the mid-20th century. During this period, advancements in technology led to the introduction of instructional radio and television. These new mediums

provided a more dynamic and interactive learning experience, reaching a broader audience and further revolutionizing the field of distance education.

Distance education, or distance learning, is defined as a field of education that emphasizes how the art of teaching can be implemented with the inclusion of technologies and other modern instructional designs. This approach enables the continuity of learning between teachers and students, which can be done in various modalities (Al-Arimi, 2014).

To further define distance learning, King et al. (2001) established that "distance learning is improved capabilities in knowledge and/or behaviors as a result of mediated experiences that are constrained by time and/or distance such that the learner does not share the same situation with what is being learned (p. 10)." This signifies that distance learning typically takes place when the teaching and learning process is influenced by various constraints, such as geographical distance, time limitations, or other situational factors. These constraints prevent the learner and the instructor from being in the same physical location or sharing the same immediate environment.

In the Philippines, the COVID-19 pandemic led to the temporary closure of many academic institutions, resulting in the adoption of distance learning for multiple school years. This shift was implemented to ensure the continuity of education despite the physical shutdown of schools, colleges, and universities across the country. This situation provided a chance for the education system, both within the country and globally, to reassess traditional teaching methods and explore the integration of distance learning as an alternative (Sato et al., 2023).

DepEd Memo DM-CI-2020-00162, issued in July 2020, outlined various distance learning modalities, such as Online Distance Learning (ODL), Blended Learning (BL), and the most widely implemented one, especially in public schools, Printed Modular Distance Learning (PMDL). The latter was recommended by the DepEd as a viable option for remote education (Talimodao & Madrigal, 2021). PMDL involves providing learners with self-learning modules, which can be in either print or digital format, depending on the learner's context and resources. The memorandum also described PMDL as a method of delivering education through individualized instruction. Learners utilize self-learning modules, available in either print or digital format, based on their specific context. These modalities are supported by family members or community stakeholders who have undergone training to function as para-teachers or learning facilitators, providing necessary guidance and assistance to the learners. This initiative by the department was guided by the aim to enhance the learning experience and offer flexibility to cater to different learning styles and needs, making education more accessible and adaptable in various circumstances.

Upon the implementation of the mentioned modalities, teachers and students had different experiences and faced numerous challenges, especially in the area of mathematics (Balasabas, 2024). As highlighted above, mathematics is an abstract subject that requires

significant effort to be taught effectively and learned thoroughly. In the study by Esguerra and Combo (2021), it was noted that solving math-related problems was much more difficult compared to when it is done at school. Several contributing factors were discussed, such as an unfavourable home learning environment, conflicts between household responsibilities and study time, parents' lack of knowledge on the subject matter, unavailable online learning resources, and difficulty in understanding English texts.

Moreover, the study by Meniano and Tan (2022) identified themes highlighting how students find learning mathematics through self-learning modules particularly challenging due to several factors. The lessons and activities are often difficult, which can be overwhelming for many students. Additionally, various distractions at home, such as noise and household responsibilities, hinder their ability to focus on learning the concepts. Time management also poses a significant problem, as students struggle to balance their study schedules with other commitments. Furthermore, the quality of the modules provided is sometimes inadequate, which adds to the difficulty of understanding the material.

Presently, although the pandemic has ended and face-to-face classes have been reinstated as the primary mode of instruction across the country, distance learning continues to persist. Despite the return to traditional classroom settings, many schools and students still rely on distance learning methods for various reasons, such as the need for flexibility, the lingering effects of the pandemic on public health, natural calamities, and other factors. This implies that the education system now operates in a hybrid manner, combining both in-person and distance learning approaches to accommodate different needs and circumstances.

It is indeed true that the pandemic has made the experiences of people in the education sector—whether they are teachers, students, or even school administrators—very challenging (Kulsum & Amelia, 2024). This has simultaneously raised questions about the future state of teaching and learning processes (Sato et al., 2023). In the area of mathematics, it has been a common mindset that distance learning modalities like PMDL pose various challenges (Combo et al., 2022; Esguerra & Combo, 2021; Meniano & Tan, 2022; Balasabas, 2024), specifically regarding how concepts and mathematical skills will be taught, as most of them require demonstrations and in-depth discussions (Balasabas, 2024). The teaching practices of mathematics teachers should be revisited to ensure that the implementation of such modalities remains effective even after the pandemic period.

With regard to how learners respond to this kind of teaching approach, especially in teaching mathematics concepts, it remains a subject of questioning since the experiences of learners in distance learning during the pandemic period are far different from their experiences in distance learning at present. This shift has raised numerous questions not only about the effectiveness of teaching methods but also about the adaptability of students to these changes. As emphasized by Kulsum and Amelia (2024), learning mathematics in the post-pandemic setup is indeed complex. They highlighted that this complexity is related to learners'

mathematical disposition. Hence, understanding how learners navigate this transition, even after the pandemic period, is crucial for developing strategies that ensure the continuity and quality of mathematics education during disruptions caused by other unforeseen circumstances.

Teaching and learning cannot be completed without assessment. Having valid and reliable assessment mechanisms plays a pivotal role in determining the success of achieving the targeted learning goals (Şenel & Şenel, 2021). Conducting distance learning modalities also includes implementing assessment strategies. According to the definition provided by DepEd (2015), assessment is the process of gathering evidence of what a learner knows, understands, and is able to do. Assessment can be conducted in two different ways: through formative assessment and summative assessment. These forms of assessment were not disregarded even when classes shifted to distance learning modalities, which created challenges for mathematics teachers. Combo et al. (2022) highlighted in their study that it became difficult for teachers to determine the authenticity of the answers provided by learners since they were working at a distance. Additionally, providing immediate feedback as part of the assessment process was also a challenge due to time constraints. Provision of feedback and continuous monitoring is important during the implementation of distance learning modalities, as it is considered a way of fostering "student-faculty communication and interaction" (Şenel & Şenel, 2021).

All things considered, it is deemed significant to continuously assess the status of the implementation of distance learning modalities in schools even after the pandemic. This ensures that the teaching practices of mathematics teachers are adapted to the context of the situation, that learners are engaged even though they are separated by distance, and that learners are assessed validly and reliably.

Research Questions

By assessing the implementation of different alternative learning delivery modalities (ALDM) in mathematics teaching after the pandemic period through the perceptions, experiences, challenges, and coping strategies of mathematics teachers, a proposed plan would be developed to assist not only them but, more importantly, secondary school learners and the public school system in general in the Division of Antipolo City, Philippines, which are directly affected by any class disruptions. More specifically, this research tried to provide answers to the following questions: What ALDM did mathematics teachers utilize whenever there are class suspensions? What were the experiences of mathematics teachers during the implementation of ALDM in the post-pandemic period in terms of: their teaching practices; learners' response; and their process of assessment? What were the challenges faced by the mathematics teachers during the implementation of ALDM in the post-pandemic period in terms of the cited variables? What coping strategies were employed by mathematics teachers to overcome the challenges they face during the implementation of ALDM in the post-pandemic period in terms of the cited variables? What teaching, learning,

and assessment plan could be proposed to assist mathematics teachers and students during the implementation of ALDM in the post-pandemic period?

Methodology

This qualitative study aimed to analyze the experiences, challenges, and coping strategies of selected mathematics teachers from two (2) public schools in the Division of Antipolo City, Philippines, one (1) from District I and another one (1) from District II. The focus was on their continuous adaptation to alternative learning delivery modalities (ALDM) in teaching mathematics at the secondary level. The study conducted an in-depth analysis of these experiences, challenges, and strategies. The results served as a basis for proposing a plan to support not only the teachers but also the students and their respective secondary schools in effectively teaching mathematics during the implementation of ALDM.

Participants. Purposive sampling was utilized to determine the participants for this study. This sampling technique was chosen to deliberately identify teacher-participants who possess certain characteristics aligned with the objectives of the study. Specifically, eight (8) mathematics teachers from the secondary level were selected. All participants in this study are currently serving as mathematics teachers at public secondary schools, whereas their selection was guided by specific criteria to ensure relevance to the research focus. First, each teacher must have actively integrated ALDM into their instructional practices, particularly during periods of class suspension caused by events such as natural disasters, health emergencies, or other disruptions. This criterion ensured that participants had direct experience with flexible teaching approaches.

Additionally, preference was given to educators who demonstrated adaptability and innovation in their teaching methods, those who showed creativity and responsiveness in transitioning to remote or hybrid learning environments. Also, participants were required to have substantial experience in implementing ALDM, ensuring that their contributions to the study were grounded in practical knowledge and reflective of sustained engagement with alternative instructional strategies.

Lastly, these individuals represent a diverse range of backgrounds and teaching contexts, but all share a common commitment to leveraging ALDM to maintain instructional continuity and student engagement during disruptions. This approach aims to gather rich, relevant data on how these mathematics educators navigate the challenges and opportunities presented by ALDM in a secondary school setting.

Data Collection and Analysis. Considering that the researcher gives high regard to the opinions of the participants, a qualitative method—particularly narrative analysis—is appropriate for this study. As defined by Creswell (2014), a narrative study is a methodological approach within qualitative research that emphasizes the exploration and interpretation of individuals' experiences through the stories they tell. This form of inquiry centers on the

personal accounts of participants, aiming to construct meaning from the sequence and structure of events in their lives.

The narrative approach is particularly significant in understanding how individuals make sense of their experiences over time, as it places a strong emphasis on the chronological ordering of events. This structure is essential for capturing the context, transitions, and turning points in participants' lives. Also, the individuals involved in the study are not merely subjects but are regarded as co-constructors of knowledge, whose narratives provide rich, in-depth insights into the phenomena being studied.

After the data collection procedure, the responses, whether in written notes or audio recordings, from the participants were organized based on the research questions set. Thematic analysis (Alhojailan, 2012) was used to identify categories and codes, which will then be interpreted as answers to the research questions. Inter-coding might be necessary to ensure the validity of the generated themes and their corresponding definitions.

To adhere to the ethical standards in conducting research, the researcher of this study sought necessary permissions through formal letters from the officers in charge at the City Schools Division of Antipolo and from the principals of the schools where the teacher-participants are assigned to teach. Additionally, informed consent forms were provided to the selected mathematics teachers. These forms outlined the data collection procedures, emphasizing the utmost confidentiality of the audio recordings, the data collected from Google Forms, and any other forms of data provided by the participants. The identity of the participants will be kept strictly confidential and will not be disclosed in any part of the research. All sensitive data obtained from the participants were handled with the highest level of care, ensuring privacy, security, and ethical compliance throughout the research process.

Results

This qualitative study analyzed the experiences, challenges, and coping strategies of selected mathematics teachers from the Division of Antipolo City, Philippines, during the implementation of ALDM.

The study focused on understanding the specific experiences and difficulties these teachers encountered and the methods they employed to overcome them. The results of this comprehensive analysis were used to develop a strategic plan designed to assist public secondary schools in addressing the various challenges faced by both teachers and students during the process of teaching and learning. This plan includes indicators or objectives to meet, recommended strategies, persons involved, timelines to consider, and the challenges that will be addressed to ensure the continuous improvement of the ALDM during periods when face-to-face classes are suspended. Implementing these developed strategies would help schools better support the educational process and ensure continuity of learning despite disruptions.

Alternative Learning Delivery Modality (ALDM) Utilized by Mathematics Teachers During Class Suspensions

One of the significant impacts of the pandemic on the education system has been the implementation of various learning modalities (Alarcon et al., 2023; Capendit, 2025). These include modular distance learning (printed/digital), online distance learning, and hybrid models combining in-person and virtual classes where students access materials and complete assignments on their own schedules. This shift has required educators to adapt their teaching methods and has highlighted the need for technological infrastructure and support for both teachers and students. As discussed by Engelbrecht et al. (2023), the focus of mathematics education has now shifted, necessitating significant adjustments from teachers and students to traditional methods, as they transitioned to remote learning and teaching, heavily relying on digital technology to conduct lessons and stay connected with students in distant campus locations.

Given that the pandemic is now manageable and face-to-face classes are allowed all over the country, some people may believe that these learning modalities are no longer useful (Corpuz, 2023). Some argue that traditional classroom settings provide better opportunities for direct interaction, immediate feedback, and a more structured learning environment (Camacho-Zuñiga et al., 2023; Sun & Zhang, 2023). However, others contend that the flexibility and accessibility of online and hybrid learning models have proven beneficial, especially for students with varying needs and circumstances (Watson et al., 2023). These modalities can offer personalized learning experiences, cater to different learning styles, and ensure continuity of education during unforeseen disruptions.

As this study suggests and based on the participants' responses, mathematics teachers identified printed and digital modular distance modalities as the most appropriate to use. They found these modalities to be much more convenient for both teachers and students. Printed modules allow students to have physical copies of learning materials, which can be particularly helpful for those with limited access to digital devices or the internet.

A mathematics teacher mentioned that *"Printed modular distance learning modality is my go-to modality since my students were used to it already. They were more exposed with it because during the pandemic, this was the main modality that we used."* On the other hand, digital modules offer the advantage of interactive content and easy distribution, making it simpler for teachers to update and share resources. Another teacher-participant shared that, *"I implement modular distance learning. I gave my students a soft copy of the material, for example mga worksheets na napripare ko, or pwedeng 'yung galing din sa mga modules. I usually send it through Messenger because it is much more accessible for them. [Translation (T)]: I implement modular distance learning by providing my students with soft copies of the materials, such as worksheets I have developed or those from the modules we use. I use the*

Messenger application to send these materials to my learners because it is more accessible for them."

Both modalities provide flexibility in terms of pacing and location, enabling students to learn at their own speed and in their own environment. This combination of printed and digital resources ensures that a wider range of student needs and preferences are met, ultimately enhancing the overall learning experience.

The Experiences of Mathematics Teachers During the Implementation of ALDM

The following tables (Tables 1-3) present a comprehensive summary of the generated themes derived from the qualitative data analysis. Each theme is accompanied by its corresponding definition and sample transcriptions, which were extracted from interviews with the selected mathematics educators. These tables serve as a foundational framework for interpreting how teachers have adapted to and sustained distance learning practices in the post-pandemic educational landscape. Furthermore, the thematic insights provide substantial support in addressing the research questions, particularly in understanding the pedagogical shifts, technological integration, and continuity strategies employed in mathematics instruction during and after the pandemic.

Table 1.

Experiences of mathematics teachers during the implementation of ALDM in terms of their teaching practices

Generated Theme	Theme Definition	Responses
Employing video lessons in mathematics constitutes an effective alternative instructional method.	This theme implies that video lessons could still be used as a supplemental and effective teaching practice during the conduct of ALDM.	*"I always share a video tutorial link together with an activity (digital copy)."* *"Whenever the need for ALDM arises, I usually make use of my PowerPoint presentations and the self-learning modules as a primary learning resource and guide among learners. Also, since I have a YouTube channel of lessons, I am sharing thru our group chat the links of my video tutorial for a more thorough and more engaging learning experiences for my learners. For assessment or assigning activities during ALDM, I am sending my learners a digital copy of the activity sheets."* *"Whenever we need to shift to ALDM I usually share video discussions from TikTok because it is way shorter than YouTube, videos which is perfect for students' attention span nowadays."*

Modular distance learning modalities ensure successful remote teaching and learning in mathematics.	This refers to how the implementation of modular distance learning modalities could be a contributory factor in successful distance learning delivery.	*"I implement modular distance learning modality due to the availability of materials given to the students."* *"Because of Technological limitations, some alternative learning modalities might not have the necessary technology or infrastructure to support innovative math teaching methods. Hence, I prefer modular modality."*

Table 2.

Experiences of mathematics teachers during the implementation of ALDM in terms of learners' responses

Generated Theme	Theme Definition	Responses
Learners are more focused on ALDM activities in mathematics due to their familiarity with distance learning.	This theme signifies that familiarity with a particular distance learning modality helps learners focus more on the activities given to them, leading to positive outcomes.	*"The learners are more focused when they watch the video tutorials."* *"Since the learners have been used to the MDL during the 2-year pandemic education set-up, they are used to the ALDM shifts as needed during the post pandemic. It has been 3 school years of post-pandemic already and learners are adept to these modalities to the point that they grew tired of answering modules and opening attachments send on their emails or messengers. As I am teaching as the years go by, I can really notice some traces of these learners being the "pandemic learners."*
Learners demonstrate their understanding of mathematics topics, even in a remote learning environment.	As this study suggests, most students are able to comprehend mathematics concepts regardless of the learning environment. Whether they are learning in a traditional classroom or using modular distance learning modalities, students can grasp mathematical concepts effectively.	*"As I have said earlier, ALDM allows sustained teaching-learning episodes even away from the school setting. Paving the way to continued school activities even at home."* *"During modular distance learning, I can say that they can easily understand the lesson."*

Learners tend to be more passive even after resuming face-to-face mathematics classes.	Since mathematics teachers primarily provide learning activities during these times, it could lead to learners becoming overly dependent, even in face-to-face classes.	*"The greater impact of becoming passive during the F2F classes has really become one of the greater challenges for me, as a teacher, whenever my learners are getting back to a regular F2F class from a declared ALDM schedule."* *"Passive learning exists because learners might adopt a passive learning approach, relying heavily on the teacher for instruction rather than taking an active role in their learning."*
Learners still need support, particularly those struggling to meet the demands of ALDM in mathematics.	This generalizes that despite being familiar with the distance learning modality, some students still need further assistance, as not everyone has the resources and capacity to perform mathematical tasks under ALDM.	*"Learners cannot respond easily if there is no follow-up discussion."* *"They still need printed activities provided by their teachers to achieve better learning."* *"Learners might have difficulty retaining mathematical concepts, possibly due to the lack of opportunities for practice or reinforcement."*

Table 3.

Experiences of mathematics teachers during the implementation of ALDM in terms of the process of assessment

Generated Theme	Theme Definition	Responses
Paper-pencil tests are still viable for assessing students' learning in mathematics during ALDM.	This emerging theme highlights that assessment can still take the form of traditional methods, even though lesson delivery has transitioned to ALDM.	*"I still used paper and pen and take-home activities."* *"I prefer using module-based and pencil and paper assessment strategies of assessment."* *"Since not all students have the access to the internet, I usually employ take-home tasks, pen and paper, and module-based assessment."*
The integration of online assessment tools in ALDM becomes an option for mathematics teachers.	Mathematics teacher-participants look into online assessment tools as an alternative to check students'	*"I use online assessments and other take-home activities appropriate for the lesson."*

	learning. Using online assessments allows teachers to create diverse and interactive question formats, including multiple-choice, short answer, and problem-solving tasks.	*"I use online tools for the formative assessments and summative assessments. In these cases, I don't focus much on their conceptual understanding but rather on their procedural understanding of the lesson."* *"Sometimes pencil and paper, sometimes online."*
The authenticity of learners' assessment results in mathematics is not as reliable as it is during supervised assessment activities.	Since ALDM hinders mathematics teachers from conducting real-time assessments and monitoring their implementation face-to-face, they find it challenging to rely solely on the results of these assessments.	*"No, I don't find it reliable. Because I am not certain if the learners are truly the ones who answered my assessment or if they have searched for answers from the available AIs on the internet. I am more confident with the results when doing assessments in class, and I am the one watching them as they accomplish the task."* *"No. Because without proper supervision, students may resort to cheating or unauthorized assistance, compromising the validity of results."*

The Challenges Faced by Mathematics Teachers During the Implementation of ALDM

Exploring the experiences of the mathematics teacher-participants consequently revealed the challenges they faced regarding the teaching practices they used, how their learners responded to the tasks and instructions they provided, and how they implemented their assessments under ALDM. Subsequently, Castroverde and Alcala (2021) concluded in their study that teachers indeed faced various challenges in implementing modular distance learning, including planning and preparing modules, delivering and collecting them, monitoring and evaluating students' performance, and providing feedback. Tables 4 to 6 present the summarized themes that highlight the common challenges faced by mathematics teachers as they strive to sustain their pedagogical practices in the post-pandemic context.

Table 4.

Challenges faced by mathematics teachers during the implementation of ALDM in terms of their teaching practices

Generated Theme	Theme Definition	Responses
Poor internet connectivity and limited device availability make the implementation of	This theme emphasizes that a lack of reliable internet and sufficient devices hinders effective teaching practices.	*"Some students don't have gadgets and internet connections, which limit the tasks I can give them."*

teaching practices challenging.		*"In terms of video or digital modules, the obvious answer is the internet connectivity."* *"Not all students are able to access the materials, especially those that are sent through messenger."*
Difficulty in the preparation of teaching and learning materials	One of the challenges faced by mathematics teachers under ALDM is creating, organizing, and effectively distributing appropriate educational resources for mathematics.	*"The double task of having myself to prepare both the printed copies and the digital copies so that whichever the learner should choose, it's going to be available."* *"Utilization of self-learning modules. That's somehow a challenge."*

Table 5.

Challenges faced by mathematics teachers during the implementation of ALDM in terms of learners' responses

Generated Theme	Theme Definition	Responses
Learners cannot respond immediately due to technological problems.	Technological problems prevent learners from responding immediately, causing delays in their communication and participation.	*"Some of the students don't have a load or WIFI. That's why you cannot gather their responses on time."* *"One of the problems for me is the internet connection. Plus, the availability of the device for online activities."* *"Internet of my students."*
Communication barriers between learners and teachers pose significant challenges when gathering responses.	Communication barriers between learners and teachers create significant difficulties in collecting responses, causing teachers to struggle with gathering timely and accurate feedback, which can hinder the effectiveness of the teaching and learning process.	*"Communication barriers. Since we are not facing one another, ALDM poses limited access to learners to really ask questions to their teachers about the lesson in real time. Subsequently, feedback and comments about learners' progress and completion of their activities are also obstructed."* *"Though some of my learners have problems with the task, they choose not to message me. Some of them do not have internet, but some of them just*

		chose not to because they are focused on other things like work, chores, etc."
Learners do not respond appropriately due to a lack of interest in the subject matter.	Students fail to engage or participate effectively because they find the topic uninteresting or irrelevant, which further leads to minimal effort, inattentiveness, and poor performance in related tasks and assessments.	*"Lack of interest and struggling in self-paced learning."* *"Lack of student engagement may be attributed to the nature of the subject, as some learners opted not to complete or even attempt their tasks due to a perceived lack of interest in mathematics."* *"They find the subject difficult. They focus on other things, and then when the face-to-face classes resume, that is the time I will hear from them."*

Table 6.

Challenges faced by mathematics teachers during the implementation of ALDM in terms of the process of assessment

Generated Theme	Theme Definition	Responses
Mathematics teachers find it difficult to fully assess learners under ALDM due to submission issues.	Mathematics teachers face challenges in fully assessing learners under ALDM due to problems with timely and complete task submissions.	*"The submission is not uniform even if you imposed a due. Some tasks, questions, and assessments are not answered the way they should be done since learners are not able to ask questions personally with regards to the tasks, the way they can clarify instructions during F2F."* *"I cannot assess them thoroughly because I have difficulty with the retrieval of their tasks."*
Providing immediate feedback to learners becomes a problem for mathematics teachers.	Providing immediate feedback to learners is challenging for mathematics teachers under ALDM due to time constraints and technological limitations, delaying timely and constructive responses.	*"During ALDM, immediate feedback is almost impossible. We have to wait for submission and checking before feedback can be done."* *"Learners might have limited opportunities for*

		feedback, which can make it challenging for them to identify areas for improvement." *"The feedback to the students becomes late."*
Under ALDM, the lack of face-to-face supervision makes the assessment results unreliable.	The lack of face-to-face supervision leads to unreliable assessment results because teachers cannot directly monitor learners' work, increasing the risk of academic dishonesty and reducing the accuracy of evaluations.	*"The reliability of the results is uncertain, as well as the learning acquisition, since some learners have access to different sources online and even AIs."* *"Students' learning environments and access to resources can vary significantly, potentially affecting their performance and the reliability of results."* *"Since it is done remotely, the answers of students are not reliable enough, so you couldn't really tell if they understand or not the topic."*

The Strategies Employed by the Mathematics Teachers to Overcome the Challenges During the Implementation of ALDM

It is inevitable for all teachers to face various challenges as they strive to make learning possible for their learners. These challenges stem from different factors, including the appropriateness of teaching strategies, the effective utilization of learning materials, and the implementation of reliable assessment approaches. These issues become even more pronounced during unexpected shifts in learning modalities, which this study aimed to explore in depth.

Tables 7 to 9 present the synthesized themes that encapsulate the strategic responses of mathematics educators in the Division of Antipolo City to the challenges of maintaining distance learning in the post-pandemic era. These themes illustrate how teachers adapted their instructional approaches, leveraged digital tools, and restructured pedagogical practices to ensure continuity and effectiveness in mathematics education.

Table 7.

Strategies employed by the mathematics teachers to overcome the challenges during the implementation of ALDM in terms of their teaching practices

Generated Theme	Theme Definition	Responses
Mathematics teachers establish open communication with the learners.	When mathematics teachers establish open communication with learners, they create a comfortable environment for students to express their thoughts and ask questions regardless of the employed ALDM. This involves active listening, encouragement, constructive feedback, and being approachable.	*"I need to talk to the students to clarify and verify their answers."* *"I always give comments on my learners' outputs or through chats with the hope that they will do better next time."* *"I always include in my instructions that whenever they have questions or there are things they find confusing, don't hesitate to send me a personal message (PM)."*
Mathematics teachers resort to reteaching the lesson.	This emerging theme implies that mathematics teachers explain the material again when face-to-face classes resume, with the use of different methods to ensure students understand it.	*"I reteach some of the topics in the classroom setup."* *"In case that we will be having face-to-face classes, I have to reteach the lesson, or if most of the students were able to access the materials, I will just intensify the review part to see if they really understood the lesson from the online or modular class."*
Mathematics teachers conduct follow-up activities once face-to-face classes resume.	Mathematics teachers conduct follow-up activities to reinforce and assess students' understanding of previously taught material in ALDM.	*"Follow-up activities were given during face-to-face."* *"Provide additional learning activities and have communication with the group chat."* *"I will make another parallel assessment about it onsite."*

Table 8.

Strategies employed by the mathematics teachers to overcome the challenges during the implementation of ALDM in terms of learners' responses

Generated Theme	Theme Definition	Responses
Mathematics teachers provide additional time for learners to complete the tasks given to them.	During ALDM, mathematics teachers extend deadlines to help students fully grasp the material and finish their work thoroughly.	*"I still give them time to do the asks and submit them during face-to-face or when we come back to school. I still asked them about the activity and*

		gave them enough time to do and submit it." *"I have them notified of the things they missed, and will give them a week to comply with it."* *"I just wait for them to respond since there are a lot of factors why students have trouble responding in class, like internet connectivity, household chores, etc."*
Mathematics teachers encourage parents to monitor the learners and ensure that the latter respond to the tasks given to them.	This signifies that mathematics teachers ask parents to actively oversee their children's progress and support their learning at home during the implementation of ALDM.	*"I advise the parents to monitor their child. Make sure that they do the tasks and are aware of the instructions."* *"Sometimes, I directly communicate with the parents."* *"If the parents are available, I message them as well. Giving them the responsibility to monitor their children, especially during the time of submission of tasks."*

Table 9.

Strategies employed by the mathematics teachers to overcome the challenges during the implementation of ALDM in terms of the process of assessment

Generated Theme	Theme Definition	Responses
Mathematics teachers make an adjustment to the deadline for the submission of tasks.	Mathematics teachers extend or modify due dates to give students more time to complete their assignments, allowing for more thoughtful and high-quality submissions as students can fully engage with the material without feeling rushed.	*"If it comes from my part, I give them a chance or additional time to answer the assessment. But if it comes from the students, I ask them why, then give them a chance if their reason is valid enough."* *"In case there are problems with the process of assessment, I am making the necessary adjustments and informing the students right away."* *"I usually extend the time of submission of the assessment."*

Mathematics teachers allow learners to retake the assessment during face-to-face classes.	Retaking assessments during face-to-face classes helps address any knowledge gaps from initial assessments conducted under ALDM, especially if students faced difficulties or distractions. This also allows teachers to evaluate students more accurately and fairly, considering their improved comprehension and readiness.	*"Retake the assessment and let the students discuss their answer."* *"I let them answer it in face-to-face."* *"Since I know that not all students have the place at their homes that is conducive to learning, I allow some of them to do the tasks again at school."*
Mathematics teachers ensure that the assessment incorporates engagement activities.	Mathematics teachers design assessments that include interactive and participatory elements to make the evaluation process more engaging for students.	*"Incorporate educational games and activities to assess students' math skills in an engaging and interactive way."* *"I engage them in real-life situation worded problems."* *"If possible, I send links from online platforms like 'Quizziz' to make the assessment interactive. But most of the time, it still fails due to a problem on the internet."*

Discussions

As the modality transitions from face-to-face to remote learning, it raises important questions about the effectiveness and relevance of traditional teaching practices employed by mathematics teachers. These practices, which have been honed over years of in-person instruction, may need to be adapted to suit the new remote learning environment. Mathematics teacher-participants have noted that, in addition to using developed materials such as modules and worksheets, they are increasingly incorporating video lessons into their teaching practice.

These video lessons serve as a valuable tool, providing a dynamic and engaging way to present mathematical concepts. Teachers believe that this multimedia approach significantly aids learners, particularly those who are visual and auditory learners, in fully comprehending the material. The use of video lessons allows for the demonstration of complex problems and solutions in a step-by-step manner, which can be replayed and reviewed as needed. This flexibility is especially beneficial in a remote learning context, where students may need to revisit the content multiple times to grasp the concepts thoroughly. The integration of video lessons helps bridge the gap created by the lack of physical presence, offering a semblance of the interactive and personal touch that face-to-face teaching provides. Teachers have observed

that this strategy not only enhances understanding but also keeps students more engaged and motivated during their learning process (Utami et al., 2021).

Furthermore, it can be added that the utilization of such an approach, together with the essentials of printed modular modality, could serve as a foundational element for the successful implementation of ALDM during the post-pandemic period. Combining video lessons with modular materials allows educators to create a more comprehensive and flexible learning environment that caters to diverse learning styles and needs (Insorio & Macandog, 2022). This blended approach enhances the accessibility of educational content and ensures that students receive a well-rounded education, even without traditional classroom settings. It supports the continuity of learning during disruptions and strengthens the educational system's resilience and adaptability in the face of future challenges.

Additionally, familiarity with remote learning has enabled learners to understand mathematical concepts in a more personalized manner. The flexibility of remote learning allows students to revisit lessons, pause, and reflect on complex topics, and engage with the material in a way that suits their individual learning styles (Mykolaiko, 2022). This personalized approach can lead to a deeper and more meaningful understanding of mathematical concepts (Sharma, 2024), as learners can take the time they need to fully grasp the material.

However, it is important to note that because most instructions and tasks were provided solely by the teachers, learners have tended to become more passive (Salem, 2023; Mykolaiko, 2022), overly relying on the teachers' presence even during face-to-face classes. This reliance suggests that there are still learners who struggle with self-directed learning and are not yet capable of completing tasks on their own for various reasons. This observation highlights the importance of balancing instructional support with the promotion of independent learning. Fostering a more active and participatory environment is a way for educators to help students build the confidence and skills needed to take ownership of their learning. Achieving this balance is essential for preparing learners to thrive across various educational modalities, whether remote or face-to-face.

Teaching and Learning cannot be completed without the process of assessment (Dikli, 2003). As one of the study's goals, the assessment processes of the mathematics teacher-participants were explored and analyzed, as they are vital in understanding the viability of teaching mathematics under ALDM. The participants revealed that paper-pencil testing remains the primary form of assessment during ALDM, mainly because it is the most accessible method for the majority of learners. This traditional form of assessment is favored due to its simplicity and the ease with which it can be distributed and completed, even in remote settings (Sharma, 2020). Despite some efforts to adopt online assessment tools, mathematics teachers have largely relied on paper-and-pencil tests due to unequal access to technology and internet connectivity among students.

Although conducting assessments during remote classes is possible, most participants expressed concerns about the reliability of these assessments compared to those conducted in a classroom setting. In a traditional classroom, assessments are supervised by teachers, ensuring that students adhere to academic integrity standards and complete their work independently. This supervision is challenging to replicate in a remote learning environment, where students may have access to unauthorized resources or assistance (Goudarzi et al., 2023; Vinte, 2025).

The participants also noted that the lack of direct teacher supervision during remote assessments can lead to inconsistencies in the results. These inconsistencies can undermine the validity of the assessment data, making it difficult to accurately gauge students' understanding and mastery of mathematical concepts. As a result, teachers may find it challenging to provide targeted feedback and support to students based on their assessment performance.

As these experiences were analyzed, several challenges emerged. One significant challenge highlighted by the participants was the unexpected and unplanned nature of many school suspensions. This unpredictability meant that the dissemination of learning materials and other teaching-related instructions to conduct ALDM had to rely heavily on the internet and social media. These technical issues often led to delays in communication, difficulties in accessing materials, and interruptions during online classes, all of which hindered the overall effectiveness of remote learning (Mykolaiko, 2022; Özüdoğru, 2021).

In addition to these logistical challenges, teachers were expected to provide activities that were appropriate for the needs of distance learning. However, the teacher-participants found this expectation problematic, as most of their weekly plans had been prepared for face-to-face implementation. Thus, teachers had to redesign their lessons to be more suitable for online delivery, ensuring that the activities were engaging and accessible to all students, regardless of their technological capabilities.

The teacher-participants also noted that their learners' responses to tasks and instructions varied widely. Some students adapted well to the new learning environment, demonstrating independence and self-motivation. These students were able to manage their time effectively, seek out additional resources when needed, and stay engaged with the material. Others, however, struggled with the lack of direct teacher support and the increased responsibility for managing their own learning. These students often found it challenging to stay motivated and organized without the structure and immediate feedback provided by a traditional classroom setting.

Another common observation made by the teacher-participants during the implementation of ALDM in teaching mathematics concepts was how technical issues hindered learners' ability to respond promptly. Problems such as unstable internet connections and limited access to devices frequently disrupted the learning process (Bahinting

et al., 2022). These technical difficulties not only caused delays in communication but also affected the overall quality of the learning experience. Students who faced these issues often found it difficult to keep up with the pace of the lessons (Asio et al., 2021) and complete their assignments on time (McLaughlin, 2016).

These situations highlight the various communication barriers between mathematics teachers and learners. Technology problems are a primary concern, as they can create significant obstacles to effective teaching and learning (Yeh & Tsai, 2022; Kallon, 2024). Additionally, a lack of interest in the subject matter can further intensify these challenges. When students are not engaged or motivated, they are less likely to participate actively in remote learning activities, which can lead to a decline in their assessment results. This is supported by the result of the study of Francom et al. (2021), in which they emphasized that teachers struggled to contact and communicate with students, motivate and engage them, and make them accountable for their learning, especially through technology, as some students showed a lack of interest in schoolwork.

Among the three mentioned indicators, assessment could be considered the most crucial one, as it provides insight into whether learners are learning and if teachers are successful in implementing their lessons. In the context of remote learning, the complexity of assessment is doubled since supervision is removed from the picture, compromising the reliability of its results. The absence of real-time supervision means that teachers cannot ensure that students are completing their work independently and honestly (Combo at al., 2022).

This lack of oversight can lead to issues such as academic dishonesty, where students might seek help from unauthorized sources or collaborate with peers inappropriately. Mathematics teachers mentioned that it is difficult for them to fully assess their learners in mathematics under ALDM, not just because they cannot supervise them in real-time, but also because some learners do not submit their deliverables. This lack of submission can stem from various factors, including technical difficulties, lack of motivation, or challenges in understanding the material without direct teacher support. Likewise, the delay or non-submission of assignments by some students worsens the challenge. Without regular submissions, teachers cannot track students' learning paths or identify areas where they might need additional support (Castroverde & Alcala, 2021). This gap in information hinders the ability to provide targeted, timely, and constructive feedback that could help students improve and succeed.

Despite these challenges, teachers are trained to be problem-solvers and do not dwell on these setbacks. They are equipped with the skills and mindset to seek out strategies and solutions that will help make the learning process as successful as it needs to be (Granziera et al., 2019). This proactive approach is essential in navigating the complexities of modern education. As mentioned earlier, one of the main challenges that mathematics teachers face in

implementing their chosen teaching practices under ALDM lies in communication and technological issues. Effective communication is crucial in any educational setting (Duta et al., 2015; Prozesky, 2000), and technological barriers can further complicate this process. To address these challenges, teachers ensure open communication with their learners. They encourage students to express their ideas, questions, and thoughts in any way possible and at any time, fostering an environment of continuous dialogue and feedback.

Additionally, this study revealed that mathematics teachers are willing to reteach mathematical concepts if that is the only way to help learners understand them better. This commitment to student understanding might require additional time and effort, but it is considered worthwhile since a thorough grasp of the topic is essential for academic success. Teachers also provide follow-up tasks to ensure that learners receive the necessary support and activities that will effectively gauge their learning progress. This follows the recommendation given by Castroverde and Alcala (2021) in which they underscored that teachers need to develop contingency plans for various issues that may arise during the teaching process.

As regards the challenges of how learners respond to the teaching of mathematics under ALDM, providing additional time to complete tasks is a strategic approach that most of the teacher-participants believe to be necessary. This approach acknowledges the diverse learning paces of students and the various external factors that might affect their ability to complete assignments on time. It also reflects an understanding of the unique circumstances each learner faces, particularly in a home-based learning environment (Esguerra & Combo, 2021).

Given that the entire process of ALDM is conducted at home, it is assumed that parents or guardians are given the responsibility to ensure that the learners respond to the tasks given to them accordingly. This shift in responsibility highlights the crucial role that parents and guardians play in the educational process (Apriyanti, 2020; Abuhammad, 2020), especially in a home-based learning environment.

Building on this shift in responsibility, traditional methods of assessment, such as in-class tests and quizzes, were not always feasible in the ALDM setting; therefore, a shift in assessment practices should also be considered. Exploring and integrating diverse assessment strategies will assist mathematics teachers in providing better support to their students' learning and ensure that assessments remain a reliable measure of their progress and understanding (Amer et al., 2022; Dikli, 2003; Meylani, 2024).

As revealed by this study, mathematics teachers ensure that they make necessary adjustments, if needed, regarding the deadlines for the submission of tasks. These adjustments focus not only on time but also on the types of tasks given to the learners. Although it might be difficult due to distance, mathematics teachers still try to integrate activities in their assessments that are interactive and engaging as a strategy to overcome the challenge of learners not being interested in the topic.

Subsequently, it was mentioned that the reliability of assessments was often questioned due to the lack of direct supervision, which made it difficult to ensure academic integrity. To address this concern, teachers allowed learners to retake assessment tasks upon the resumption of face-to-face classes. This measure ensures that students are evaluated properly and fairly, providing an opportunity to verify their understanding and mastery of the subject matter in a controlled environment.

In summary, mathematics teachers generally faced significant challenges in sustaining distance learning, including limited resources, communication problems, student engagement issues, and assessment constraints. But through adaptive strategies, they demonstrated resilience and innovation which addressed the immediate needs of the learners while laying the foundation for a more flexible and future-ready educational system.

Proposed Teaching, Learning, and Assessment Plan to Assist Mathematics Teachers and Students During the Implementation of ALDM

The main reason this study was conducted is to ensure that necessary actions are taken to address the challenges faced by mathematics teachers and students during the implementation of ALDM in the post-pandemic era. Having a plan for this purpose will enable teachers to conduct remote teaching and learning smoothly, and students to respond appropriately. This proposed plan includes indicators or objectives to meet, recommended strategies, persons involved, timelines to consider, and the challenges that will be addressed to ensure the continuous improvement of the implementation of ALDM during periods when face-to-face classes are suspended.

Table 10.

Proposed Teaching, Learning, and Assessment Plan for Mathematics Teachers during the Implementation of ALDM

Indicators in Teaching Mathematics under ALDM	Recommended Strategies	Persons Involve	Timeline	Challenges to be Addressed
Teaching and Learning **1. Incorporating video lessons into teaching mathematics as a supplemental instructional approach.**	▪ Download the videos ahead of time and save it to the computer tablets owned by the school *(Provided by the LGU)*. ▪ Lend these computer tablets to selected learners who do not have personal gadgets.	▪ Mathematics teachers ▪ ICT Coordinator ▪ Property custodian ▪ Students ▪ Parents	During the implementation of ALDM	▪ Learners still need support, particularly those struggling to meet the demands of ALDM in mathematics. ▪ Poor internet connectivity and limited device availability make the implementation of teaching practices challenging.

Teaching and Learning **2. Intensifying the implementation of modular distance learning in teaching mathematics concepts.**	▪ Create a learning plan that involves tasks that can also be done remotely. ▪ Utilize self-learning modules from time to time. ▪ Share worksheets and other learning materials through online platforms even during face-to-face classes as part of making learners familiar with the process of distance learning.	▪ Mathematics teachers ▪ Students ▪ LR Coordinator	All year round	▪ Difficulty in the preparation of teaching and learning materials
Teaching and Learning **3. Ensuring that active learning is still promoted under ALDM.**	▪ Develop activities that require learners to think critically and independently. ▪ Provide activities that allow learners to do the tasks without being 'spoon-fed'. ▪ Create an opportunity for the learners to defend their work during face-to-face classes to ensure that there are in-depth and active learning.	▪ Mathematics teachers ▪ Head teachers ▪ Master teachers ▪ Students	Before, during, and after the implementation of ALDM	▪ Learners do not respond appropriately due to a lack of interest in the subject matter.
Teaching, Learning, and Assessment **4. Establishing open communication among mathematics teachers, learners, and parents/guardians.**	▪ Create a remote learning environment that promotes active listening, accessibility, constructive feedback, teachers' responsiveness, and mutual respect. ▪ For monitoring purposes, teachers can do it in two ways: (1) through online platforms like the Messenger app; and (2) through printed monitoring sheets, which will be completed by the parents and submitted together with the home-based tasks when face-to-face classes resume.	▪ Mathematics teachers ▪ Students ▪ Parents	During and after the implementation of ALDM	▪ Learners cannot respond immediately due to technological problems. ▪ Communication barriers between learners and teachers pose significant challenges when gathering responses. ▪ Learners do not respond appropriately due to a lack of interest in the subject matter.
Assessment **5. Conducting assessment practices that are fair, constructive,**	▪ Perform formative assessment strategies remotely that are engaging and interactive for learners.	▪ Mathematics teachers ▪ Students	During and after the implementation of ALDM	▪ Under ALDM, the lack of face-to-face supervision makes the assessment

considerate, and innovative.	▪ As for summative assessments, it is still encouraged to conduct them during the resumption of face-to-face classes to ensure the reliability of the results.				results unreliable. ▪ Mathematics teachers find it difficult to fully assess learners under ALDM due to submission issues. ▪ Providing immediate feedback to learners becomes a problem for mathematics teachers.
Teaching, Learning, and Assessment **6. Intensifying review sessions during the resumption of face-to-face classes, focusing on the topics discussed under ALDM.**	▪ Instead of reteaching the entire lesson, it is encouraged to include only key concepts from the topics discussed under ALDM. ▪ Aside from reteaching, teachers can give follow-up activities *(formative or summative assessments)* to learners during the resumption of face-to-face classes.	▪ Mathematics teachers ▪ Master teachers ▪ Head teachers ▪ Students	After the implementation of ALDM	▪ Mathematics teachers resort to reteaching the lesson.	
Assessment **7. Allowing learners to accomplish their tasks under ALDM without the pressure of having limited time.**	▪ Mathematics teachers should provide activities that are self-paced. The setting of deadlines should depend on the type of tasks given and the type of learning environment the majority of the students have.	▪ Mathematics teachers ▪ Students	During the implementation of ALDM	▪ Mathematics teachers find it difficult to fully assess learners under ALDM due to submission issues.	

Conclusions

After thorough analysis, this study concludes that implementing ALDM in mathematics teaching could still be a viable tool to ensure the continuity of learning despite any disruptions, although its success depends on the type of learner. The findings revealed that mathematics teachers in Antipolo City, Philippines, primarily relied on printed and digital modular distance learning modalities to sustain instruction in the post-pandemic period. Despite challenges such as limited resources, communication barriers, and assessment constraints, teachers employed adaptive strategies—such as video lessons, open communication, and flexible assessment practices—to support student learning effectively.

The study highlights the importance of preparation. Both teachers and learners need to be adequately prepared for the transition to distance learning. For teachers, this means having the necessary training and resources to effectively deliver lessons remotely. This

includes familiarity with digital tools and platforms, as well as strategies for engaging students in a virtual environment. For learners, preparation involves having access to the required technology and understanding how to navigate online learning platforms.

Moreover, engagement is crucial for the success of distance learning. Teachers must find ways to keep students actively involved in their learning. This can be achieved through interactive lessons, regular feedback, and opportunities for students to collaborate with their peers. Engaging students helps to maintain their interest and motivation, which are essential for effective learning. The study further emphasizes the need for a well-structured plan to guide the implementation of distance learning. This plan should include clear objectives, recommended strategies, and timelines. It should also address potential challenges and provide solutions to overcome them. A comprehensive plan ensures that both teachers and learners have a roadmap to follow, which can help to reduce uncertainty and improve the overall effectiveness of the learning process.

Lastly, it is worth noting that how teachers responded to the call for a pedagogical shift through ALDM not only demonstrated resilience and innovation in meeting learners' immediate needs but also laid the groundwork for a more flexible and future-ready educational system, highlighting the need to strengthen support for teachers.

Recommendations

This study recommends that schools should properly adopt ALDM as an integral part of the education system. They should give high consideration to how the process will be implemented and continuously improved, ensuring that it primarily benefits the learners. This involves a thorough planning phase where schools assess the specific needs of their students and the resources available to them. Continuous improvement can be achieved by regularly collecting feedback from students, teachers, and parents, and making necessary adjustments based on this feedback.

Teachers, on the other hand, should be well-prepared for the demands of the shift in modality. This preparation includes developing materials that are suitable for remote learning, adopting teaching practices that engage students in a virtual environment, and creating assessment approaches that accurately measure student learning in a remote setting. Further, students should be encouraged to become responsive and active learners. This means that they should take initiative in their learning, participate actively in home-based tasks, and make use of the resources provided to them.

For parents, their role is crucial in ensuring the success of remote learning. They need to work hand in hand with teachers to monitor their children's progress and provide the necessary support at home. This includes setting up a conducive learning environment, helping with technical issues, and encouraging their children to stay focused and engaged.

Similar studies related to post-pandemic education can also be conducted, focusing on other modalities, research methods, and different school contexts.

REFERENCES

Abuhammad, S. (2020). Barriers to distance learning during the COVID-19 Outbreak: A Qualitative review from Parents' perspective. *Heliyon, 6*(11). https://www.cell.com/heliyon/fulltext/S2405-8440(20)32325-2

Al-Arimi, A. (2002). Distance learning. *Procedia - Social and Behavioral Sciences*, 82-88. https://doi.org/10.1016/j.sbspro.2014.09.159

Alarcon, J., Sacopayo, S., Omela, A., Lictawa, M., & Pantiligan, J. (2021). Assessing learning modalities and their impact on student experiences: A study of Senior HighSchool students at PSALMS, Inc. *International Journal of Academic and Practical Research, 2*(1). https://doi.org/10.5281/zenodo.8031171

Alhojailan, M. I. (2012). Thematic Analysis: A Critical Review of its Process and Evaluation. *WEI International European Academic Conference Proceedings*, 8–21. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=0c66700a0f4b4a0626f87a3692d4f34e599c4d0e

Amer, A., Sidhu, G., Bo, Z., & Srinivasan, S. (2022). A short review of online learning assessment strategies. *International Journal of Pedagogy and Teacher Education, 6*(2), 89–103. https://jurnal.uns.ac.id/ijpte/article/view/66579

Apriyanti, C. (2020). The parents role in guiding distance learning and the obstacle during covid-19 outbreak. *Jurnal Ilmiah Pendidikan Dasar, 7*(2). https://repository.stkippacitan.ac.id/id/eprint/805/2/The%20Parents%20Role%20in%20Guiding%20Distance%20Learning.pdf

Asio, J. M. R., Gadia, E., Abarintos, E., Paguio, D., & Balce, M. (2021). Internet Connection and learning device availability of college students: Basis for Institutionalizing flexible learning in the new Normal. *Studies in Humanities and Education, 2*(1), 56–69. https://doi.org/10.48185/she.v2i1.224

Assey, E. S. & Babyegeya, E. (2022). The challenges facing Effective teaching, learning and assessment in Community-Based Secondary Schools in Tabora Region. *American Journal of Education and Practice, 6*(2), 1–17. https://doi.org/10.47672/ajep.1084

Bahinting, M. a. P., Ardiente, M. P., Endona, J. E., Herapat, M. a. A., Lambo, D. C., Librea, H. J. A., Librando, M. C. Y., Libron, J. B. B., Petaluna, M. J., Ygot, G. C., Taneo, J. D., Cabello, C. A., & Minyamin, A. V. (2022). Stronger than the Internet Connectivity: A Phenomenology. *Zenodo (CERN European Organization for Nuclear Research)*. https://doi.org/10.5281/zenodo.6791820

Balasabas, J. (2024). Understanding the Effects of Modular Distance Learning on Junior High School Students' Mathematics Academic Performance in Post pandemic: A Teacher's Perspective. *International Journal of Multidisciplinary Educational Research and Innovation*. *2*(4), 241-251. https://works.hcommons.org/records/0e7dg-x5j69

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education, 32*(3), 347–364. https://doi.org/10.1007/bf00138871

Cajurao, E., Ogaya, M., Almonicar, C., Jr, Abella, G., & Escalante, J. (2023). Exploring factors affecting the adoption of flexible learning modality by public university students in Masbate, Philippines. East Asian Journal of Multidisciplinary Research, 2(3), 1313–1326. https://doi.org/10.55927/eajmr.v2i3.3473

Camacho-Zuñiga, C., Peña-Becerril, M., De La O Cuevas-Cancino, M., & Avilés-Rabanales, E. G. (2023). Gains from the transition from face-to-face to digital/online modality to improve education in emergency. Frontiers in Education, 8. https://doi.org/10.3389/feduc.2023.1197396

Capendit, J. (2025). Evaluation of 5e modelled inquiry-based electronic strategic intervention materials (esims) in mathematics 8. *Psychology and Education: A Multidisciplinary Journal, 35*(3), 309–321. https://doi.org/10.70838/pemj.350308

Castroverde, F., & Acala, M. (2021). Modular distance learning modality: Challenges of teachers in teaching amid the Covid-19 pandemic. *International Journal of Research Studies in Education, 10*(8). https://doi.org/10.5861/ijrse.2021.602

Classroom Assessment Guidelines | Department of Education. (2015, May 26). https://www.deped.gov.ph/2015/05/26/classroom-assessment-guidelines/

Combo, J., Esguerra, M., & Reyes, Z. (2022). Teachers' responsiveness to students' needs in solving mathematical problems under modular distance modality. *European Online Journal of Natural and Social Sciences 2022, 11*(4), 155–171. https://european-science.com/eojnss_proc/article/view/6707

Corpuz, P. C. (2023). Integrating 7E Instructional Learning Cycle in developing instructional material using Google Site in General Mathematics. *Zenodo (CERN European Organization for Nuclear Research)*. https://doi.org/10.5281/zenodo.8196153

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. *SAGE Publications*. https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf

Cueto, L. J., & Agaton, C. B. (2021). Pandemic and Typhoon: Positive impacts of a double disaster on mental health of female students in the Philippines. *Behavioral Sciences, 11*(5), 64. https://doi.org/10.3390/bs11050064

Dikli, S. (2003). Assessment at a Distance: Traditional vs. Alternative Assessments. *The Turkish Online Journal of Educational Technology, 2*(3), 13–19. http://files.eric.ed.gov/fulltext/EJ1101956.pdf

Duero, M. (2020, July 25). July 21, 2020 DM-CI-2020-00162 – Suggested Strategies in Implementing Distance Learning Delivery Modalities (DLDM) for School Year 2020–2021 DepEd Region VIII. Department of Education Region VIII - Eastern Visayas. https://region8.deped.gov.ph/2020/07/25/july-21-2020-dm-ci-2020-00162-suggestedstrategies-in-implementing-distance-learning-delivery-modalities-dldm-for-school-year2020-2021/

Duta, N., Panisoara, G., & Panisoara, I. (2015). The Effective Communication in Teaching. Diagnostic Study regarding the academic Learning Motivation to students. *Procedia - Social and Behavioral Sciences*, 186, 1007–1012. https://doi.org/10.1016/j.sbspro.2015.04.064

Engelbrecht, J., Borba, M. C., & Kaiser, G. (2023). Will we ever teach mathematics again in the way we used to before the pandemic? ZDM, 55(1), 1–16. https://doi.org/10.1007/s11858-022-01460-5

Esguerra, M. A. & Combo, J. A. (2021, November 23 – 25). Learning mathematics from a distance: A basis for continuous improvement on printed modular distance learning (PMDL) modality [Paper presentation]. 2021 Virtual Conference of Basic Education Researchers, Cainta, Rizal

Francom, G. M., Lee, S. J., & Pinkney, H. (2021). Technologies, Challenges and Needs of K-12 Teachers in the Transition to Distance Learning during the COVID-19 Pandemic. *TechTrends, 65*(4), 589–601. https://doi.org/10.1007/s11528-021-00625-5

Gaba, A. K., Bhushan, B., & Dev, K. R. (2021). Factors influencing the preference of distance learners to study through online during COVID-19 pandemic. Zenodo (CERN European Organization for Nuclear Research). https://doi.org/10.5281/zenodo.4965925

Granziera, H., Collie, R. J., & Martin, A. J. (2019). Adaptability: An important capacity to

cultivate among pre-service teachers in teacher education programmes. *Psychology Teaching Review, 25*(1), 60–66. https://doi.org/10.53841/bpsptr.2019.25.1.60

Hornby, G., & Lafaele, R. (2011). Barriers to parental involvement in education: An explanatory model. *Educational Review, 63*(1), 37–52. https://doi.org/10.1080/00131911.2010.488049

Goudarzi, E., Hasanvand, S., Raoufi, S., & Amini, M. (2023). The sudden transition to online learning: Teachers' experiences of teaching during the COVID-19 pandemic. *PLoS ONE, 18*(11), e0287520. https://doi.org/10.1371/journal.pone.0287520

Insorio, A. O., & Macandog, D. M. (2022). Video lessons via YouTube channel as mathematics Interventions in modular distance learning. *Contemporary Mathematics and Science Education, 3*(1), ep22001. https://doi.org/10.30935/conmaths/11468

Kallon, A. (2024). Perspective Chapter: The Digital Divide in a Global Emergency – How Technology is Shaping Academic Performance in Diverse Communities. *In IntechOpen eBooks*. https://doi.org/10.5772/intechopen.113923

King, F. B., Young, M. F., Drivere-Richmond, K., & Schrader, P. G. (2001). Defining Distance Learning and Distance Education. *AACE Journal, 9*(1), 1–14. https://www.learntechlib.org/primary/p/17786/article_17786.pdf

Kulsum, Z., & Amelia, R. (2024). Didactical obstacles for junior High school students in Post-Pandemic Mathematics Learning. (JIML) *Journal of Innovative Mathematics Learning, 7*(1), 106–114. https://doi.org/10.22460/jiml.v7i1.19678

McLaughlin, C. (2016, April 20). The homework gap: the "Cruelest part of the digital divide." *NEA Today*. Retrieved July 23, 2025, from https://www.nea.org/nea-today/all-news-articles/homework-gap-cruelest-part-digital-divide

Meniano, K. R., & Tan, R. (2022). Challenges in Studying Mathematics using Self-Learning Module during COVID-19 Pandemic. *American Journal of Educational Research, 10*(4), 182–187. https://doi.org/10.12691/education-10-4-4

Meylani, R. (2024). A comparative analysis of traditional and modern approaches to assessment and evaluation in education. *Batı Anadolu Eğitim Bilimleri Dergisi, 15*(1), 520–555. https://doi.org/10.51460/baebd.1386737

Mintii, I. S., Vakaliuk, T. A., Ivanova, S. M., Chernysh, O. A., Hryshchenko, S. M., & Semerikov, S. O. (2021). Current state and prospects of distance learning development in Ukraine. https://doi.org/10.31812/123456789/4593

Mykolaiko, V., Honcharuk, V., Gudmanian, A., Kharkova, Y., Kovalenko, S., & Byedakova, S. (2022). Modern Problems and Prospects of distance Educational Technologies. *International Journal of Computer Science and Network Security, 22*(9). https://doi.org/10.22937/IJCSNS.2022.22.9.40

Özüdoğru, G. (2021). Problems faced in distance education during Covid-19 Pandemic. *Participatory Educational Research, 8*(4), 321–333. https://doi.org/10.17275/per.21.92.8.4

Prozesky, D. R. (2000). Communication and effective teaching. PubMed, 13(35), 44–45. https://pubmed.ncbi.nlm.nih.gov/17491962

Salem, A. (2023). Utilizing active learning techniques to lessen passivity in distance learning due to the covid-19 pandemic. *EDULEARN Proceedings,* 1, 2372–2380. https://doi.org/10.21125/edulearn.2023.0693

Sato, S. N., Moreno, E. C., Rubio-Zarapuz, A., Dalamitros, A. A., Yañez-Sepulveda, R., Tornero-Aguilera, J. F., & Clemente-Suárez, V. J. (2023). Navigating the new normal: adapting online and distance learning in the Post-Pandemic era. *Education Sciences, 14*(1), 19. https://doi.org/10.3390/educsci14010019

Şenel, S., & Şenel, H. C. (2021). Remote Assessment in Higher Education during COVID-19 Pandemic. *International Journal of Assessment Tools in Education, 8*(2), 181–199. https://doi.org/10.21449/ijate.820140

Sharma, P. (2024). Revolutionizing Math Education: The Power of Personalized Learning. *International Journal for Multidisciplinary Research, 6*(2). https://doi.org/10.36948/ijfmr.2024.v06i02.16508

Sharma, S. (2020, September 23). Sharma: Online Testing Is Great. But Traditional Pencil-and-Paper-Work Gives Insights That Digital Can't, Especially in Math. The 74. https://www.the74million.org/article/sharma-online-testing-is-great-but-traditional-pencil-and-paper-work-gives-insights-that-digital-cant-especially-in-math/

Sherry, L. (1995). Issues in Distance Learning. *International Journal of Educational Telecommunications, 1*(4), 337-365. https://www.learntechlib.org/p/8937/article_8937.pdf

Sun, Q., & Zhang, L. J. (2023). Examining the relative effectiveness of online, blended and face-to-face teaching modes for promoting EFL teacher professional development. Porta Linguarum Revista Interuniversitaria De Didáctica De Las Lenguas Extranjeras. https://doi.org/10.30827/portalin.vi2023c.29619

Talimodao, A. J. S., & Madrigal, D. V. (2021). Printed Modular distance learning in Philippine public Elementary Schools in time of COVID-19 Pandemic: quality, implementation, and challenges. *Philippine Social Science Journal, 4*(3), 19–29. https://doi.org/10.52006/main.v4i3.391

Utami, A. R., Oktaviani, L., & Emaliana, I. (2021). The use of video for distance learning during COVID-19 Pandemic: Students' voice. *JET ADI BUANA, 6*(02), 153–161. https://doi.org/10.36456/jet.v6.n02.2021.4047

Vinte, J. V. (2025). Paper-and-pencil vs Online Assessment in Distance Education: Examining EFL Students' Preferences and Challenges in a Mozambican Tertiary Institution. *Nitel Sosyal Bilimler, 7*(1), 1–27. https://doi.org/10.47105/nsb.1569632

Watson, C., Templet, T., Leigh, G., Broussard, L., & Gillis, L. (2022). Student and faculty perceptions of effectiveness of online teaching modalities. *Nurse Education Today*, 120, 105651. https://doi.org/10.1016/j.nedt.2022.105651

Yeh, C., & Tsai, C. (2022). Massive Distance education: Barriers and challenges in shifting to a complete online learning environment. *Frontiers in Psychology. 13*. https://doi.org/10.3389/fpsyg.2022.928717