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From in Loco Parentis to in Loco Magistri: Navigating Mathematics Instruction in a Modular Learning Framework

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ABSTRACT

The COVID-19 pandemic significantly disrupted education systems worldwide, prompting governments to adopt alternative learning modalities. In the Philippines, the Department of Education implemented modular distance learning to ensure continuity in instruction. This study explores the experiences of parents and guardians as they assumed a more active role in facilitating their children's education at home. Specifically, it examines the strategies they employed, the challenges they encountered, and the coping mechanisms they utilized to support learning. Using thematic analysis, the study identified key instructional strategies, including memorization, translation, the use of examples, online resource utilization, and reliance on parents' prior knowledge (schema). However, several challenges emerged, such as conflicts between parental work obligations and teaching responsibilities, limited subject knowledge, student behavioral issues, and the influence of social media. To address these difficulties, parents and guardians adopted various coping strategies, including reinforcement through rewards and punishments, structured rules and discipline, social support mechanisms, and time management techniques. Based on the findings, the study proposes a strategic support plan aimed at enhancing parental involvement in modular learning, particularly in subjects like Mathematics, where parental competency can significantly impact student performance. The study underscores the critical role of parent-teacher collaboration in improving the home-based learning experience and ensuring educational quality during times of crisis.

INTRODUCTION

The COVID-19 pandemic significantly disrupted education worldwide, necessitating a rapid transition from traditional face-to-face instruction to remote learning modalities. In the Philippines, the Department of Education (DepEd) adopted modular distance learning, wherein students' study independently using printed or digital modules, often without direct real-time interaction with teachers. This shift has redefined the role of parents, positioning them as primary facilitators of their children's education at home. Unlike conventional classroom settings where teachers provide structured instruction, modular learning requires parents to bridge the gap between instructional material and student comprehension, particularly in subjects that demand step-by-step guidance, such as mathematics (Private Education Support Committee, 2020). Parental engagement is crucial in modular learning environments. Despite lacking formal training, parents' support is central to students' success (Private Education Support Committee, 2020). However, parents in the Philippines face various challenges, such as limited internet access and financial constraints, which affect their ability to support learning at home (Alvarez, 2020). Studies also highlight barriers to effective remote learning, including individual, pedagogical, technical, and financial obstacles, emphasizing the essential role of parents' adaptable support in modular learning (Lassoued *et al.*, 2020).

Extensive research sheds light on the importance of parental involvement in student success. Studies indicate that active parental engagement enhances motivation, academic performance, and socio-emotional development (Thornton, 2018; Green *et al.*, 2019). However, in a modular learning setup, parents—who may lack pedagogical training—are expected to facilitate learning without structured support, particularly in rural areas where limited internet access, financial constraints, and low parental education levels further exacerbate these challenges (Alvarez, 2020). Given these conditions, understanding how parents navigate and adapt their teaching strategies to support their children's mathematics education is critical.

Mathematics presents unique challenges in modular learning due to its abstract nature and reliance on interactive, scaffolded instruction (Fritz *et al.*, 2019). Traditional classroom-based mathematics instruction enables teachers to identify misconceptions in real time, adjust strategies based on student responses, and provide multiple representations of concepts (Cassibba *et al.*, 2020). In contrast, modular learning places the burden of instruction on parents, many of whom struggle with limited mathematical knowledge, pedagogical experience, and differentiated learning approaches (Mangwende *et al.*, 2019). Additionally, parents' struggles with teaching mathematics are compounded by their own lack of specialized knowledge in the subject, making it difficult

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for them to effectively guide their children (Kim, 2020). Parents' strategies in modular learning are shaped by their parenting styles. According to Baumrind's Theory of Parenting Styles (1966), parents can be authoritative, authoritarian, or permissive, each with implications for home-based education. Authoritative parents, who provide structured but flexible support, are particularly suited to modular learning demands (Cherry, 2020). The Constructivist Theory further emphasizes learning as an active process, and parents who engage interactively—offering real-world examples and fostering problem-solving—achieve better learning outcomes, although they may experience increased stress (Bhamani *et al.*, 2020). Despite its challenges, studies suggest that modular learning can be effective under specific conditions. Research indicates that modular instruction allows students to engage with content at their own pace, improving understanding and performance (Lim, 2019; Khalil *et al.*, 2020). However, the success of modular learning also depends on the support provided by teachers and parents. Identified gaps in modular learning highlight the need for training programs that equip parents with effective tutoring strategies, particularly in underserved communities (Agaton & Cueto, 2021).

This study seeks to explore the strategies, challenges, and coping mechanisms of parents as they facilitate modular learning in mathematics for Grade 7 students. By identifying effective instructional strategies and common obstacles, the study aims to propose a strategic support framework that can empower parents to navigate modular mathematics instruction more effectively. The findings will contribute to educational policies and training programs that enhance parental engagement in remote learning environments.

LITERATURE REVIEW

MATERIALS AND METHODS

This qualitative descriptive study explores the teaching strategies parents use, the challenges they encounter, and the coping mechanisms they employ in supporting their children's mathematics learning in a modular distance setting. Thematic Analysis was applied to systematically identify recurring patterns in parental experiences (Nowell *et al.*, 2017). This approach aligns with Yin's (2019) emphasis on qualitative methods for understanding real-life issues and Creswell's (2013) case study framework, which allows for an in-depth exploration of parents' roles in modular learning.

The study involved ten (10) randomly selected Grade 7 parents from City of Balanga National High School, ensuring equal representation of male and female participants, including guardians, to provide a balanced perspective. Random sampling supports the collection of representative data, while Gunderson *et al.* (2018) highlight the significance of parental involvement in education. Data was gathered through semi-structured interviews, a method known for eliciting detailed insights into participants' strategies, challenges, and coping

mechanisms. The interview guide was reviewed by experts in mathematics education and a psychometrician to ensure clarity and relevance (Büyüköztürk *et al.*, 2019; Yıldırım & Şimşek, 2018).

Following ethical guidelines, participants provided informed consent, and confidentiality was strictly maintained (Merriam & Grenier, 2019). Data collection involved briefing participants and conducting audio-recorded interviews. Thematic Analysis was then applied, following a structured coding and theme identification process to ensure reliability and accuracy (Braun & Clarke, 2020). Language experts reviewed transcripts, and data saturation was achieved when no new themes emerged.

RESULTS AND DISCUSSION

Theme 1: Strategies of Parents in Teaching Mathematics Internet Sourcing

Internet sourcing emerged as a key strategy for parents supporting their children in mathematics. Many parents relied on online resources such as Google and YouTube to comprehend complex topics and translate them into simpler terms for their children.

Several participants emphasized the significance of Google as a primary tool for answering specific mathematical queries. For instance, Participant 1 noted that they “immediately go to Google” when encountering difficulties, indicating a pragmatic reliance on internet searches. Similarly, Participant 2 stated, “Magtatanong po ma'am kay Google,” reflecting the internet's role as an accessible support mechanism for parents navigating challenging topics.

Translation emerged as another common strategy, particularly when modules contained English-language material that students struggled to understand. Participant 3 shared, “When I know the answer, I discuss it with my child in Filipino,” underscoring how language adaptation bridges the gap between English instruction and the child's first language.

Additionally, YouTube served as a valuable tool for visual learners and for explaining complex topics. Participant 8 stated, “We watch tutorials on YouTube and try to understand them so that I can explain it to my child,” demonstrating how online videos provide structured, step-by-step breakdowns of mathematical concepts. Some parents also preferred using laptops over mobile phones for watching tutorials, as laptops minimized distractions and fostered a more focused learning environment.

Providing Examples in Problem Solving

Another prevalent strategy involved parents creating and providing additional examples to simplify mathematical concepts.

Participant 1 explained, “I provide simple examples to help him understand,” underscoring the role of simplification in parental instruction. Similarly, Participant 2 mentioned, “I give examples similar to those in the modules,” ensuring that additional exercises align with formal instructional materials.

For more complex problems, parents developed structured patterns or step-by-step breakdowns. Participant 3 shared, “I examine the examples and create patterns for better comprehension,” illustrating the use of scaffolding techniques to support learning. Repetition was another critical approach; Participant 7 noted, “I give him similar exercises using the same formula and teach him the procedure,” highlighting the effectiveness of repetition in reinforcing mathematical concepts. Parents also employed pacing strategies to help children manage difficult problems. Participant 8 stated, “I encourage him to complete easier items first before revisiting the more challenging ones,” reflecting an approach that fosters confidence and persistence in problem-solving.

Memorization of the Four Fundamental Operations

Parents encouraged memorization, particularly of the four fundamental operations (addition, subtraction, multiplication, and division), to establish a strong mathematical foundation. Hoque (2018) posited that memorization strengthens neural connections, facilitating problem-solving.

Several participants emphasized the importance of multiplication table mastery. Participant 1 stated, “I have him memorize the multiplication table,” reinforcing its role in computational fluency. Likewise, Participant 2 noted, “I made him memorize multiplication tables to simplify problem-solving,” demonstrating the long-term benefits of this approach.

Beyond multiplication tables, parents emphasized the memorization of problem-solving patterns and formulas. Participant 3 shared, “I instruct him to memorize solving patterns and formulas,” illustrating how structured memorization aids comprehension. Repetition reinforced this process; Participant 6 remarked, “We repeatedly practice addition, subtraction, multiplication, and division to reinforce learning.”

However, some parents acknowledged that memorization alone was insufficient. Participant 10 stated, “If he struggles after multiple attempts, I explain the correct procedure,” highlighting the need for guidance and conceptual understanding alongside rote learning.

Parents Sharing Their Knowledge in Mathematics

Parental involvement in teaching mathematics often relied on their existing knowledge, aligning with Schema Theory, which suggests that prior knowledge enhances comprehension.

Parents frequently provided direct explanations and corrections. Participant 1 remarked, “I explain the correct answer,” indicating an active role in addressing misunderstandings. Similarly, Participant 3 noted, “I review his work and correct errors,” reinforcing the importance of immediate feedback.

Scaffolding also emerged as a key instructional approach. Participant 4 shared, “I guide him while he answers,” illustrating how parents provided structured support

before gradually encouraging independence. Some parents sought external assistance for complex topics. Participant 6 admitted, “I ask for help from those more knowledgeable,” reflecting a proactive effort to supplement their instructional strategies.

In some instances, parents learned alongside their children. Participant 9 stated, “I consult the teacher and study with my child before teaching,” demonstrating an adaptive learning approach where parents engage with unfamiliar material to enhance their teaching efficacy.

Translation of English to Filipino

Participant 1 simply stated, “I translate it into Tagalog,” illustrating the direct approach taken by parents to enhance accessibility. Technology also played a role in this strategy. Participant 2 shared, “We use Google for translations to facilitate understanding,” emphasizing the integration of digital tools in instructional support. Similarly, Participant 4 remarked, “We translated into Tagalog using Google,” demonstrating parents’ reliance on online resources for language translation.

Beyond direct translation, some parents conducted additional research to ensure their children fully understood the material. Participant 3 explained, “I research further and translate difficult terms into Filipino,” reflecting an effort to deepen comprehension through supplementary learning.

Translation was particularly beneficial in mathematical problem-solving. Participant 7 stated, “We translate terms first before solving problems to make them easier to understand,” indicating that linguistic adaptation facilitated the application of mathematical concepts. However, some children experienced challenges due to language preferences. Participant 10 noted, “He is more proficient in English than Filipino, so he sometimes struggles with Filipino translations,” highlighting the need for flexible language strategies tailored to individual learning preferences.

Theme 2: Challenges Experienced by Parents in Teaching at Home

Parent’s Workload

Balancing work and teaching responsibilities emerged as a significant challenge for many parents, with time management being a primary concern (Simbre, 2019). Parents struggled to divide their attention between professional obligations and supporting their children’s education. Participant 1 shared, “I have a hard time keeping up with my work and monitoring my son’s answers, so I only help them sometimes in the evening.” This illustrates the reality of many working parents, who often provide academic assistance only after work hours, creating a delay in addressing their children’s learning needs.

For some, household chores and caregiving responsibilities further complicated the situation. Participant 2 described the challenge of managing a business while supporting their child’s education: “It’s difficult because I have to take

care of household chores like laundry and cooking, but I manage because it's necessary for my child." Similarly, Participant 3 stated, "Even though I have a lot of work, I make time for teaching, even if it means multitasking while cooking or taking care of my child." These accounts reflect the dedication of parents who, despite their demanding schedules, prioritize their children's academic needs.

Even parents working from home faced challenges. Participant 4 expressed, "I'm late coming home from work," highlighting how professional commitments reduce their availability for their children's schooling. Others noted the mental strain of managing both work and their role as at-home educators. Participant 6 stated, "My thoughts are divided between work and my child's studies," demonstrating the cognitive load that parents bear.

Time management strategies were crucial in balancing these demands. Panol *et al.* (2021) emphasized the importance of setting dedicated study times for children. Many participants reported prioritizing reviewing their children's assignments before bedtime, ensuring they remained academically engaged. However, some parents struggled to directly supervise their children due to work commitments. Participant 7 stated, "There is no one to take care of his siblings, so when he can't answer something, I help him alone." This highlights the additional responsibilities parents bear beyond academic supervision.

Extended family members often stepped in to support children's learning. Participant 10 shared, "He often answers his modules with his grandfather because I have a job," illustrating the communal approach some families adopt to address these challenges. Nonetheless, the physical and mental strain of balancing multiple responsibilities impacted parents' ability to consistently monitor their children.

Mathematics Lesson Complexity

The complexity of mathematics lessons, particularly in topics involving fractions, exponents, and algebra, posed additional challenges for parents (Acharya, 2018). Many parents struggled to assist their children with abstract mathematical concepts, often due to their own unfamiliarity with the material.

Participant 1 reported difficulties with "exponentials, polynomials, and operations with x and y variables," while Participant 2 highlighted challenges with "division involving decimals." Similarly, Participant 3 noted, "Fractions, decimals, polynomials, and exponents are particularly difficult to explain," emphasizing the struggle parents face in conveying complex topics to their children. Algebra emerged as a particularly challenging subject. Participant 9 admitted, "I had a hard time with algebra, so I also had a hard time helping him," underscoring the shared struggle between parents and students. The pandemic further exacerbated these difficulties, as the shift to remote learning limited direct teacher-student

interaction, making it harder for students to grasp fundamental mathematical concepts (Participant 10).

Student Behavior and Motivation

Motivating children to engage in learning posed another significant challenge (Simbre, 2019). Participants reported that their children often became frustrated or disengaged, particularly when dealing with complex subjects. Participant 1 observed that her child only sought help when overwhelmed. Participant 2 implemented a strategy of taking breaks to reduce frustration, while Participant 3 noted that moments of tension arose when their child resisted learning.

Parental involvement plays a crucial role in student motivation. It can be observed that adolescents perform better academically when their parents are engaged in their education. Participants emphasized the importance of maintaining a supportive learning environment, though some acknowledged that frustration sometimes led to scolding or conflicts.

Distractions from Mobile Games and Social Media

Excessive screen time emerged as a major distraction affecting children's focus on academics. Wang *et al.* (2018) found that prolonged exposure to mobile games and social media negatively impacts academic performance. Many parents expressed frustration over their children's divided attention, even during online classes. Participant 1 noted that "chatting with peers" disrupted learning, while Participant 3 restricted online gaming to two hours per day to ensure academic priorities remained central.

To mitigate distractions, parents employed various strategies, such as setting screen time limits, turning off electronic devices during study sessions, and establishing rules that required homework completion before leisure activities. Participant 6 explained that they "turn off the TV and use the cellphone only when necessary for looking up lesson materials," while Participant 7 confiscated their child's phone until schoolwork was completed. However, enforcing these rules required constant monitoring, which added to the parents' workload.

Parents' Educational Background

Limited educational backgrounds also affected parents' ability to assist their children, particularly in mathematics (Garbe *et al.*, 2020). Participant 1 admitted struggling with unfamiliar terms, while Participant 2 expressed insecurity due to having only completed high school.

Many parents felt unqualified to assist with complex subjects. Participant 4 reported difficulty comprehending English-language materials, while Participant 5 refrained from directly helping their child due to a lack of educational experience. Parents with limited formal education often relied on teachers or older siblings for support. Participant 7 sought clarification from educators, acknowledging their struggle with the curriculum.

Financial constraints further hindered some parents' ability to provide academic support. Participant 8

noted that a lack of resources, such as textbooks and supplementary materials, made it difficult to facilitate learning at home. Despite these challenges, some parents made efforts to bridge the gap. Participant 9 stated, “I refresh my knowledge so I can help my child,” while Participant 10 expressed a willingness to learn the material alongside their child.

CONCLUSION

This study highlights the crucial role parents play in supporting students’ learning in modular distance education, particularly in mathematics. Parents employed various strategies, such as using online resources, simplifying concepts, encouraging memorization, and translating content into Filipino. However, challenges such as the complexity of mathematics, language barriers, limited educational backgrounds, and the demands of balancing work and teaching responsibilities hindered their ability to provide consistent academic support. Additionally, distractions from mobile devices further impacted student engagement.

While modular instruction offers flexibility, its effectiveness depends on a strong support system involving teachers, accessible learning resources, and continuous parental guidance. Without proper training or instructional support, parents struggled to assume the role of educators, affecting both their confidence and their children’s learning outcomes. Therefore, modular instruction should be complemented with structured interventions, including teacher-led instructional support and resource development, particularly for complex subjects like mathematics.

To improve parental support in modular instruction, schools may offer workshops or instructional videos on mathematics topics, equipping parents with the skills to assist their children. Teachers may simplify module content using accessible language without requiring full translation, ensuring that both students and parents can understand mathematical concepts more easily. Reducing the number of activities per lesson can also enhance student engagement, preventing burnout and disinterest. Additionally, providing a glossary of mathematical terms with simplified definitions can help both parents and students navigate complex topics more effectively.

To address digital learning barriers, schools and local governments may consider providing offline-capable devices with pre-installed learning applications, ensuring that students have access to educational resources even without an internet connection. Schools may also develop parent-friendly modules with guided instructions to help guardians better facilitate learning at home. In addition, institutions like the City of Balanga National High School may organize training sessions for parents to enhance their instructional skills and reinforce effective learning strategies.

Finally, further research may be conducted to refine and enhance the framework of this research to inform future innovations, program development, and policy

adjustments to strengthen parental involvement in modular education.

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