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Coping with Numbers in Crisis: STEM Students' Experiences in Mathematics Learning During the Pandemic

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Abstract. Mathematics is a subject that requires critical understanding and problem-solving skills. However, the COVID-19 pandemic disrupted traditional classroom learning, shifting students from face-to-face instruction to remote or modular learning. This study explored the lived experiences of Grade 12 STEM students at a faith-based high school in learning Mathematics amidst the pandemic. The study aimed to investigate the challenges encountered, the lessons learned, and the coping strategies employed by STEM students. Utilizing a qualitative phenomenological approach, data were gathered through in-depth interviews, which employed unstructured guide questions to capture the students' perceptions and experiences. The responses were transcribed and analyzed thematically. Findings revealed that students faced significant challenges, including difficulty in understanding mathematical concepts, poor time management, and a lack of motivation. Despite these obstacles, students recognized that face-to-face learning provided a more effective environment for understanding Mathematics, while modular learning was often perceived merely as a compliance requirement. To overcome these challenges, students adopted self-directed learning strategies and time management techniques such as creating personal study schedules. The study concludes that while the pandemic posed substantial difficulties in Mathematics learning, it also fostered resilience and independent learning habits among students, highlighting the importance of learner support in times of educational disruption.

Keywords: Faith-based high school; Mathematics; Pedagogy; Phenomenology; STEM

1.0 Introduction

Mathematics has long been recognized as a discipline that demands active engagement, critical thinking, and continuous interaction between students and teachers. One of the most essential aspects of effective learning is the relationship between teachers and students. Strong teacher-student interaction has a significant influence on students' understanding and performance, particularly in subjects such as mathematics. However, in practice, many classrooms still lack sufficient interaction, which negatively impacts students' engagement and achievement (Sinay, 2016). Mathematics, being a core subject across all educational levels, plays a vital role in developing students' logical reasoning and problem-solving abilities. Yet, numerous factors influence students' attitudes toward mathematics, including learner characteristics, peer relationships, teaching methods, and the overall classroom environment (Yilmaz et al., 2010).

A key component of effective mathematics learning is the development of a growth mindset, the belief that abilities and understanding can improve through effort and persistence. According to Dweck (2008), students

with a growth mindset are more likely to embrace challenges and persist despite difficulties. Boaler (2016) further emphasizes that this mindset is best cultivated in environments where students receive consistent support and engage in collaborative exploration. However, under modular learning conditions, students are often left to study in isolation. In this context, many students have resorted to waiting for answer keys or relying on peers rather than actively attempting to solve problems, signaling a more passive and survival-oriented approach to learning.

Traditionally, mathematics instruction thrives in face-to-face settings where immediate feedback, guided practice, and collaborative problem-solving are possible. However, the COVID-19 pandemic caused a massive disruption to this dynamic, forcing schools to transition to distance and modular learning formats. This shift left many students, particularly those studying complex and abstract subjects such as mathematics, struggling to adapt to independent learning with limited support (UNESCO, 2020).

The global education crisis triggered by the COVID-19 pandemic has sparked a surge in research into educational technology and digital learning strategies. Scholars such as Agnoletto and Queiroz (2020), Mulenga and Marbán (2020), Smith (2020), and Zhao and Xu (2020) emphasized the need for technological innovation and adaptability in the face of prolonged school closures. These studies have explored both the academic and psychological impacts of the pandemic, underscoring the need to develop effective remote learning alternatives.

Another challenge to mathematics learning during the pandemic is the lack of prior knowledge among students. According to Gafoor and Kurukkan (2015), students without sufficient foundational knowledge struggle to understand higher-level concepts, leading to rote memorization and a decrease in self-efficacy. Teachers have also expressed difficulty in revisiting prerequisite topics due to the tight structure of the curriculum. This often results in students believing they are incapable of learning mathematics.

Additionally, the pandemic has shifted students' academic priorities. As learning became more practical and results-focused, many students began viewing mathematics as merely a subject to pass each quarter, rather than as a meaningful intellectual pursuit. This attitude may stem from the perception that math is less immediately relevant to their daily lives compared to other subjects (Alder & Davis, 2006).

Although experts such as Zhu and Chin (2020) highlight the potential of digital resources to support learning, the reality for many students in less urbanized regions is a lack of access to reliable internet, learning devices, and digital literacy. These limitations make it difficult for students to take advantage of online tutorials or educational tools that could supplement their learning. As a result, the digital divide continues to widen existing gaps in academic achievement and confidence in mathematics.

In the context of online learning, several factors such as self-regulated learning (SRL), emotional engagement, and motivation have been shown to influence academic performance. Cho and Heron (2015) found that students with higher levels of motivation and self-regulation performed better and were more satisfied with their online mathematics learning experiences. They recommended strategies such as enhancing student self-efficacy, providing course orientation, designing supportive tools, and offering SRL guidance through social media to improve outcomes.

Collectively, these studies provide a comprehensive understanding of the challenges and opportunities in mathematics education during the pandemic. They highlight the need for strong teacher-student relationships, supportive learning environments, effective instructional strategies, and access to quality learning resources whether online or modular to ensure student success in mathematics, even in times of crisis.

The onset of the COVID-19 pandemic brought drastic changes to education systems worldwide. In the Philippines, the Department of Education introduced alternative learning modalities, such as online and modular learning, to accommodate students affected by school closures. For learners without internet access, modular learning became the most viable option (Hernando-Malipot, 2020). Several studies have examined how these new learning modalities influenced mathematics education. For instance, Sintema (2020) reported that reduced contact hours and the absence of digital tools significantly hindered student performance in mathematics, particularly among Grade 12 STEM students. Similarly, Sinay (2016) emphasized that school culture and management style also play a substantial role in shaping students' academic outcomes.

Amid the shift to remote education, modular learning became a crucial method, especially in less connected communities. Studies by Aksan (2021), Dangle and Sumaoang (2020), and Alcantara (2015) affirmed the effectiveness of modular distance learning in improving student performance in mathematics. These findings highlight the importance of well-prepared, accessible learning materials and the need for thoughtful planning. Burke (2020) noted that the transition to modular learning also required new teaching skills, fostering problem-solving, adaptability, and collaboration among educators and learners.

At a faith-based senior high school in Southern Luzon, Philippines, Grade 12 STEM students have been significantly affected by this educational shift. Modular learning, designed to be self-directed, has proven challenging for subjects like mathematics that require conceptual clarity and iterative learning. Without the benefit of in-person instruction, students often struggle to understand mathematical concepts presented in written modules. The absence of real-time teacher interaction or classroom discussion has further reduced their ability to seek clarification or explore different problem-solving strategies, resulting in a decline in their confidence and engagement.

This study aims to explore the lived experiences of Grade 12 STEM students in a faith-based school in Southern Luzon as they navigated the challenges of mathematics learning during the pandemic. It focused on the difficulties they faced, the coping strategies they employed, and the lessons they derived from this unprecedented shift in education. Understanding their experiences can help inform future interventions and teaching strategies that better support students in developing mathematical resilience, regardless of the learning modality.

2.0 Methodology

2.1 Research Design

This study employed a phenomenological research design, grounded in Patton's (1990) perspective, to explore the lived experiences of Grade 12 STEM students learning mathematics during the COVID-19 pandemic. In line with phenomenological principles, the focus was on uncovering *what* students experienced and *how* they experienced it, specifically, their perceptions of modular versus face-to-face learning amidst unprecedented challenges. The methodology involved bracketing researchers' preconceptions, engaging in in-depth interviews to capture students' thoughts, feelings, and coping behaviors, and systematically analyzing the data to reveal the essential structures and shared meanings of their pandemic-learning experiences. By focusing on these richly textured, subjective accounts, the study aimed to provide a nuanced understanding of the phenomenon as experienced by students, rather than imposing external frameworks or seeking generalizable truths.

2.2 Participants and Sampling Technique

The research was conducted at a faith-based high school in Southern Luzon, Philippines, where ten Grade 12 STEM students, identified by the STEM adviser as having experienced significant challenges in learning mathematics during the COVID-19 pandemic, were selected through purposive sampling. This non-probability approach was chosen because it allowed the researchers to deliberately select information-rich cases that directly addressed the study's phenomenon of interest . By focusing on students who struggled academically in modular learning settings, the researchers ensured the depth and relevance of the data, aligning with established qualitative guidelines that emphasize the purposeful selection of participants to uncover nuanced, lived experiences.

2.3 Research Instrument

A semi-structured interview guide was crafted to explore students' challenges, insights, and coping strategies. It consisted of clear, student-friendly questions designed to elicit rich qualitative data. To ensure the validity of the instrument, a panel of three experts — two in mathematics education and one in qualitative research — was invited to review the guide. The experts assessed each item for content relevance, clarity, appropriateness of language, and alignment with the study's objectives. Based on their feedback, revisions were made to refine the question wording, remove ambiguities, and enhance alignment with the research questions. This expert validation process helped establish content validity and ensured the tool's appropriateness for the intended participants.

2.4 Data-Gathering Procedure

Data were gathered through semi-structured interviews administered as open-ended written questionnaires, following the qualitative interview approach outlined by Braun and Clarke (2021). This format allowed participants to express their experiences freely, promoting reflection and reducing response pressure, thereby

enhancing the authenticity and richness of their responses. Interviews were scheduled at times and locations convenient to the respondents, with consideration for their comfort, safety, and willingness to participate candidly. The open-ended format ensured a deeper exploration of students' perspectives and contextual insights.

2.5 Data Analysis Procedure

Interviews were transcribed and analyzed using thematic coding, guided by Braun and Clarke's (2006) six-phase model. An iterative approach was employed to ensure a deep and accurate understanding of the data, allowing themes to emerge that captured the essence of students' lived experiences in learning Mathematics during the pandemic. To enhance the trustworthiness of the study, multiple validation techniques were applied. Triangulation was used by comparing data across different participants and researchers to ensure consistency of interpretations. Member checking was conducted by presenting a summary of the emergent themes to the participants to confirm that the findings accurately reflected their experiences. Reflective journaling was maintained throughout the research process, enabling the researchers to document their thoughts, assumptions, and analytic decisions, thereby enhancing transparency. Furthermore, peer review was utilized, with colleagues independently reviewing the coding and thematic structure to minimize potential researcher bias. Collectively, these strategies addressed the four established criteria of qualitative trustworthiness: credibility, confirmability, dependability, and transferability.

2.6 Ethical Considerations

Ethical approval was obtained from the school director and principal. Before data collection, participants were asked to sign an informed consent form, which secured their voluntary participation, ensured confidentiality, and granted them the right to withdraw at any time. The semi-structured approach also ensured cultural sensitivity and respect for the participants' voices.

3.0 Results and Discussion

This study explores the lived experiences of Grade 12 STEM students of a faith-based high school in learning Mathematics during of pandemic. The phenomenon compelled the interest in exploring the STEM students' experiences, challenges, feelings, and coping mechanisms in learning Mathematics due to the pandemic. A qualitative framework was used. The data collection and analysis were guided by methods standard to phenomenological research. The findings are the culmination of the experiences, challenges, and coping mechanisms of STEM students in learning Mathematics during the pandemic. After interviewing 12 STEM students and analyzing data, three major themes emerged that expand and enrich the understanding of the lived experiences of students.

3.1 Challenges Encountered

The participants expressed their challenges encountered in learning Mathematics amidst the pandemic, and several sub-themes emerged.

Individual Learning

Through interviews, the participants were asked about the challenges they encountered in learning mathematics, and one of the key themes that emerged was difficulty in understanding the lesson. Several students expressed frustration with learning independently through self-study. Student 1 stated, "*It is hard because of self-study*," while Student 2 remarked, "*It is hard because I need no learn on my own*." Student 4 echoed this by saying, "*Understanding the lesson as my own*," and Student 5 shared, "*It is hard because even though I tried my best to understand, I always failed*." These responses reflect a common struggle among students in modular learning: the lack of direct teacher guidance, limited feedback, and minimal peer interaction, all of which are vital for building mathematical understanding (Sintema, 2020; Yilmaz et al., 2010). As most of the students learn best through collaboration, independent learning is challenging for them (Candelario-Aplaon, 2020).

The findings align with Lee and Kung (2018), who emphasized the importance of recognizing students' mathematics self-concept in online learning settings. A student's self-concept, their perception of their abilities in mathematics, plays a crucial role in their motivation, persistence, and ultimately, their performance (Cho & Heron, 2015). When students are left to learn complex mathematical concepts on their own, especially without prior knowledge or adequate support, it can lead to feelings of incompetence, anxiety, and disengagement (Gafoor & Kurukkan, 2015). This highlights the need for educators to design modular and online learning materials that are more interactive, scaffolded, and accessible, and to incorporate frequent feedback mechanisms to support student

understanding (Dangle & Sumaoang, 2020; Burke, 2020). Understanding these early challenges allows educators to improve and diversify their strategies, thereby fostering a more positive and effective learning environment for mathematics in remote modalities.

Time-Management

As participants described their lived experiences, another significant sub-theme that emerged was time management. Many students struggled to balance academic responsibilities with household duties. Student 7 remarked, "*It is hard to divide my time between household chores and answering modules*," while Student 3 shared, "*Sometimes I struggle in spending time answering modules, because of other responsibilities*." These statements highlight the burden students face when trying to manage multiple roles within the home, especially in the context of modular learning, where structured classroom schedules are absent. Unlike traditional classroom settings where learning time is clearly defined, modular and distance learning shifts the responsibility of scheduling and prioritizing tasks onto the students themselves, often without sufficient support or guidance.

This difficulty in balancing tasks is consistent with Wright's (2002) Jar Theory, which suggests that time should be viewed as a limited container that needs to be filled mindfully with essential tasks, first symbolized by large rocks, followed by less critical ones, such as pebbles and sand. The theory suggests that individuals must prioritize essential responsibilities and adjust their schedules to accommodate other tasks, thereby achieving a balance that fosters productivity. For students without clear time management strategies or external structure, essential academic work may be compromised by domestic obligations. According to Liu et al. (2024), targeted time management interventions not only enhance academic performance but also improve students' self-efficacy in a higher education setting. Furthermore, Claessens et al. (2007) emphasized that time management is a self-regulation strategy that allows individuals to allocate their time more efficiently, reduce stress, and improve performance outcomes. Learning may occur through effective time management (Candelario-Aplaon, 2020).

Therefore, educational institutions must support students not only academically but also in developing life skills such as time management. This could involve integrating time management workshops, providing sample study schedules, or reducing non-essential academic load for students facing multiple responsibilities at home. Recognizing the challenges students face in balancing academic and personal life is essential to making modular and remote learning more equitable and effective.

Unmotivated

The students were unmotivated in learning Mathematics during of pandemic. According to student 9, "*I feel unmotivated to do things because no matter how I tried, I cannot understand it, it feels like I am doing it for completion*". Student 10 added that "*I am doing this just for the requirements of the subject*". Students felt unmotivated in learning Mathematics due to the abrupt shift to the new mode of learning. Cho and Heron (2015) determined the impact of self-regulated learning (SRL), learning strategies, and emotions on satisfaction in mathematics achievement. The study revealed that motivation influenced achievement, and both motivation and emotion were related to satisfaction. Similarly, Pelikan et al. (2021) emphasized that during emergency remote teaching, students experienced a decline in academic motivation, mainly due to feelings of isolation, limited interaction, and the perceived difficulty of self-paced learning. Furthermore, Huang et al. (2021) found that students' engagement and motivation significantly declined in online learning environments, particularly in subjects requiring high cognitive demand, such as mathematics, which led to poorer academic outcomes and increased academic burnout.

Among the challenges, understanding the lesson in Mathematics is the most challenging for the participants. It was evident from the responses that there are several challenges that the students encountered in learning Mathematics amidst the pandemic.

3.2 Learnings from those Challenges

When they were asked about the lessons learned from the challenges they encountered, the following sub-themes emerged from the responses.

Difficult to Learn Mathematics

The students' reflections, such as Student 3's remark, "*It's difficult to understand the topic on my own,*" and Student 5's observation, "*I don't understand the topic in a new mode of learning. If no one will teach you how to solve math problems, then you can't understand it,*" underscore the challenges faced in mathematics education, particularly within remote

or self-directed learning contexts. These sentiments highlight a broader and persistent issue: the firm reliance on traditional, teacher-led instruction and the lack of supportive structures to facilitate independent learning.

Research confirms that students, especially in rural or under-resourced areas, face significant hurdles due to inadequate instructional support and limited access to learning resources. Candelario-Aplaon (2020) emphasized that during the pandemic-induced lockdowns, students found it difficult to continue their education due to the absence of adequate learning materials at home. Similarly, Memon (2007) and Anderson et al. (2005) noted that underqualified teaching personnel and resource scarcity contribute to ineffective mathematics instruction, making it difficult for learners to grasp abstract mathematical concepts on their own.

The transition to remote and modular learning has further exacerbated these challenges. Without structured guidance, students struggle to maintain academic engagement and comprehension. Student 7 articulated this difficulty by stating, "*I realized that it is different to learn math without help.*" The need for meaningful instructional interaction is critical, particularly in mathematics, where conceptual understanding often hinges on scaffolding and timely feedback. According to Bozkurt et al. (2020), the sudden shift to remote education revealed deep inequities in access, preparedness, and instructional quality. Moreover, König et al. (2020) argued that teachers' digital competencies and instructional adaptability played a pivotal role in student outcomes during the pandemic.

To address these systemic challenges, it is essential to invest in comprehensive teacher training programs that emphasize student-centered, technology-integrated pedagogies. As suggested by Trust and Whalen (2020), professional development that focuses on digital instructional design and differentiated teaching strategies is crucial for fostering learner autonomy and engagement. Equally important is ensuring that students have access to high-quality, contextualized learning materials that can support their cognitive development in mathematics, even in the absence of direct teacher facilitation. By acknowledging and responding to these structural barriers, the education system can better support students in navigating the complexities of mathematics learning in a post-pandemic world.

Face-to-Face is Better than Modular Learning

Through interviews, participants consistently stated a preference for face-to-face instruction over modular learning. Student 2 asserted, "*Face-to-face class is better than modular learning*," while Student 8 reflected, "*I realized I am better in face-to-face than learning all by myself*." Similarly, Student 6 affirmed, "*Learning Mathematics through face-to-face is better than learning it in a modular*."

Students emphasized that face-to-face settings help minimize distractions and offer real-time interaction, factors crucial for understanding mathematical concepts independently. Their reflections align with findings in the broader literature: a survey by Hamilton et al. (2020) revealed that 83% of teachers struggled with remote instruction and 76% believed that students were falling behind when learning from home.

These statistics highlight the systemic challenges of modular or remote learning: limited teacher engagement, technological hurdles, and the absence of structured support. Hamilton et al. (2020) also found that only 12% of teachers covered the entire curriculum at home, raising serious concerns about students' grade-level readiness.

By aligning student voices with empirical evidence, this discussion underscores the clear benefits of face-to-face instruction for mathematics. It also indicates that effective learning environments depend not only on instructional format but also on adequate resources, structured support, and teacher preparedness, areas where modular learning often falls short.

The Module is just a Requirement.

Several participants emphasized that, for them, modules became little more than box-checking exercises rather than genuine learning opportunities. Student 1 said, "*It feels like I am doing it for completion and requirements for the subject*," while Student 4 added, "*I am doing it to pass even though I cannot clearly understand the lesson*." These remarks reveal a troubling pattern: modules are treated as tasks to finish, not as vehicles for comprehension.

Shernoff (2013) argued that without self-regulatory skills, real-time feedback, and social interaction, students are prone to procrastination, demotivation, and poor time estimation, particularly when facing unstructured tasks or

competing priorities. This framework directly explains the students' experiences during modular learning: in the absence of teacher guidance, timely feedback, and peer interaction, students tend to adopt a compliance-based rather than a learning-oriented mindset.

Research on academic motivation and procrastination further supports this concern. According to Steel (2007), students with low self-regulation are more likely to delay academic tasks, rush through them at the last minute, and exhibit diminished learning outcomes. Their belief that they are "doing it just to pass," as expressed by Student 4, exemplifies a performance goal orientation—focused more on meeting requirements than on mastering content (Elliot & McGregor, 2001). Zimmerman and Schunk (2011) also emphasize that learners lacking self-regulated learning strategies often show reduced engagement and lower academic achievement, especially in independent learning contexts.

Moreover, the absence of timely and meaningful feedback in modular learning can erode cognitive and emotional engagement. Shernoff (2013) warned that when students receive no reinforcement for their effort, *"procedural engagement"*—merely going through the motions—can replace authentic learning. Student 1 and Student 4's reflections clearly reflect this disengaged behavior. Similarly, Martin (2009) noted that students in low-feedback environments often experience reduced motivation and a weaker sense of academic self-efficacy, particularly when learning tasks are repetitive or lack personal relevance.

To address this issue, instructional design must go beyond content delivery. Students require structured feedback loops, opportunities for reflection, and adaptive learning mechanisms that foster autonomy and deeper understanding. Incorporating interactive elements—whether through blended formats, peer discussions, or teacher check-ins—can shift learners from passive completion to active engagement. As Hodges et al. (2020) emphasized in their framework for emergency remote teaching, learner success depends not just on access to content but on pedagogical structures that promote motivation, connection, and accountability.

3.3 Coping Mechanism

Through interviews and analysis of data in terms of the coping mechanisms of the Grade 12 STEM students from the challenges that they encountered in learning Mathematics amidst the pandemic. The following sub-themes emerged from the responses of the participants.

Self-Taught

Participants demonstrated growing self-reliance in their learning through various adaptations. Student 2 expressed newfound confidence: "*I learned to trust myself that I can answer the difficult lessons*." Although Student 3 acknowledged that she did not consistently achieve a complete understanding—"it does not need to understand well the lesson, you have to do your best and that is it" — she supplemented her learning by watching related videos. Student 4 shared that whereas before she relied on teachers, "*now I usually teach myself*." Likewise, Student 6 noted that in the absence of a teacher in a face-to-face setting, "*this time, I understand it on my own*." To compensate, students turned to different platforms and social media tools as supplementary learning resources.

This shift aligns closely with Daryl Bem's Self-Perception Theory (1972), which suggests that individuals infer their own beliefs and attitudes by observing their behavior, particularly in situations where internal cues are unclear. In this context, students noticed themselves engaging with lessons independently, seeking videos, teaching themselves, and deduced, "*I must be capable of solving these problems*," thereby forming more positive attitudes toward their academic abilities. As Bem (1972) argued, when we act without external prompts, we naturally attribute this behavior to internal dispositions.

Applied here, students learned through action: by teaching themselves and actively seeking out resources, they traced their evolving competence back to their efforts. Even if their conceptual understanding was not always perfect, the behavior—taking initiative and using external tools — reinforced a growing belief in their capacity to learn and problem-solve. That's Self-Perception Theory in practice. Meilany et al. (2025) emphasize the significant contribution of learning independence to academic success and self-efficacy, aligning with students' inferences about their capabilities based on their independent actions. The global shift of the education landscape to independent learning provides a contextual backdrop for student development (Zajda, 2024). Moreover, Syukur et al. (2024) and Paniagua and Drent (2025) found that self-directed learning and digital literacy have a positive impact on critical thinking and confidence.

Scheduling

Grade 12 STEM students frequently used scheduling as a key coping mechanism, balancing module work with household responsibilities and leveraging time-management strategies to enhance learning. For instance, Student 3 shared, "*As a slow learner, I need to spend my time learning the lessons thoroughly*," while Student 5 emphasized the importance of "*my time-management skills, my mindset, and attitude*." Student 7 noted that they manage their time effectively and turn to Google when they are stuck, and Student 8 even works on modules during weekends. Students 9 and 10 reiterated that they allocate extra time to fully understand lessons, using mobile phones, and scheduling study blocks appropriately. These self-regulated behaviors align strongly with Hearon's (2015) findings, which suggest that students who employ adequate time and task management are more likely to achieve higher academic outcomes. Research by Zimmerman (2002) further supports the notion that self-regulated learners actively monitor, plan, and adapt their learning behaviors, resulting in better outcomes.

By planning study periods, prioritizing tasks, and utilizing digital tools, these learners not only cope with stress but actively enhance their academic performance, demonstrating that disciplined scheduling and resourceful learning strategies foster both comprehension and success. In addition to aligning with Hearon's (2015) findings that disciplined time and task management correlate with higher achievement, the students' scheduling behaviors also exemplify key components of academic buoyancy—specifically coordination (effective planning) and commitment (persistent effort despite challenges) (Martin & Marsh, 2008). Their examples, like allocating weekend study blocks, using digital tools to clarify concepts, and deliberately extending time for comprehension, are concrete expressions of these traits.

These practices not only help students manage academic stress but also foster resilience when facing learning setbacks. For instance, Student 7's habit of turning to Google for clarification indicates problem-focused coping, a behavior linked to adaptive performance and effective stress mitigation (Skinner, Edge, Altman, & Sherwood, 2003). The use of digital tools as academic aids reflects the shift toward learner autonomy in online and blended environments, as noted by Broadbent and Poon (2015), who found that time management and help-seeking significantly predict academic success in digital learning contexts.

Together, these findings suggest that intentional structuring of study time and proactive help-seeking promote both academic performance and emotional resilience. Encouraging these habits through training in planning techniques, accessible digital supports, and time-management workshops can reinforce students' scheduling strengths and further enhance their capacity to thrive academically under pressure.

4.0 Conclusion

This qualitative phenomenological study shed light on the lived experiences of Grade 12 STEM students in learning Mathematics during the pandemic. The shift to modular learning presented significant challenges, most notably, difficulty in understanding lessons and managing time effectively. Students expressed that without the structure and support of face-to-face classes, learning became isolating and unclear. Many perceived modules not as learning tools but merely as requirements for academic compliance. Despite these obstacles, students developed adaptive coping strategies. They turned to digital platforms, such as social media and online videos, to supplement their understanding and relied on time management techniques like scheduling to balance academic demands with household responsibilities. These experiences underscore the importance of direct teacher interaction, structured support, and accessible resources in fostering meaningful mathematics learning, particularly during times of educational disruption.

Drawing on the findings and existing literature on effective learning strategies, several key recommendations emerge. First, teachers should enrich their instruction by integrating curated supplemental materials such as short explanatory videos, interactive simulations, and screencasts alongside module content to enhance understanding and engagement Second, parents play a crucial role and should strive to create a conducive learning environment at home by ensuring a clean, well-ventilated, distraction-free space; in parallel, encouraging structured routines and goal setting can bolster students' time management and self-regulatory habits. Third, school administrators should support these efforts by offering professional development on blended and remote teaching techniques, including the use of interactive tools and time-management interventions, as well as establishing enrichment programs like math clubs, peer tutoring, or virtual workshops that foster community, real-time feedback, and academic reinforcement. By coordinating resources, environments, and support across teachers, parents, and

administrators, the educational ecosystem can transform modular learning from a box-checking exercise into an empowering, resilient, and ultimately practical academic experience. For future studies, it is recommended to include the influence of external factors, such as socio-economic status, parental education and involvement, and community support systems.

5.0 Contributions of Authors

Author 1: conceptualization, data gathering, data analysis
Author 2: data analysis, data gathering, literature review
Author 3: proposal writing, data gathering, transcription
Author 4: formulation of research instruments, data analysis, and writing the final draft

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7.0 Conflict of Interests

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