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DIFFICULTIES ENCOUNTERED AND SELF-EFFICACY IN BASIC MATHEMATICAL CONCEPTS AMONG PUBLIC HIGH SCHOOL LEARNERS: A SEQUENTIAL EXPLANATORY ANALYSIS

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ABSTRACT

Mathematics serves as a fundamental pillar of human knowledge, shaping not only academic pursuits but also daily decision-making and problem-solving. This study investigated the difficulties encountered and self-efficacy in basic mathematical concepts among public high school learners of Macatingog Integrated School, Schools Division of Calbayog City, for the school year 2025-2026. This two-phased study used a sequential-explanatory mixed methods design, with quantitative data collected through a diagnostic test on learners' performance in basic mathematical concepts, followed by qualitative data from key informant interviews to explore their difficulties and self-efficacy. Findings demonstrated that most learners have poor mastery of basic mathematical concepts, with a substantial proportion failing to meet the expected proficiency standards. Furthermore, participants from KIIs disclosed multifaceted difficulties encountered in basic mathematical concepts, arising from cognitive, affective, social, and instructional factors. Moreover, the self-efficacy of public high school learners in Mathematics was characterized by moderate yet unstable confidence, affected by a reliance on procedural strategies and social support. It is highly recommended to implement institutionalized remedial or intervention programs and differentiated instruction to address foundational gaps in basic concepts, focusing on learners who do not meet proficiency standards.

Keywords: Mathematics education; academic performance; math difficulties; basic mathematics concepts

1.0 INTRODUCTION

Mathematics serves as a fundamental pillar of human knowledge, shaping not only academic pursuits but also daily decision-making and problem-solving. Its influence has persisted throughout history and remains integral in today's rapidly evolving society (Parojenog & Pabalan, 2024). Despite its importance as a core discipline within educational systems, Mathematics continues to present significant challenges for high school students, many of whom struggle to grasp concepts and apply skills effectively. This difficulty extends beyond classroom performance, affecting students' broader academic development and self-efficacy (Hanifah et al., 2021). The persistent obstacles encountered by learners highlight the urgent need for innovative teaching strategies that connect mathematical theory to real-world contexts.

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Recent data from the Programme for International Student Assessment (PISA) reveal that the Philippines ranks 76th out of 81 countries in Mathematics, with scores falling far below the baseline proficiency (OECD, 2022). This concerning result has prompted educators, policymakers, and leaders to reconsider current curriculum, instructional practices, and learning environments in order to promote deeper conceptual understanding and mathematical literacy (Benetiz, 2020). In response, the Philippine Department of Education (DepEd, 2022) has emphasized the necessity of immediate reforms. However, systemic shortcomings persist, as many initiatives address only the broader problem while neglecting the nuanced challenges faced by learners and teachers in implementation (Velez et. al., 2023). Within public schools in Calbayog City, in particular, it is vital to examine the specific difficulties and efficacy of high school students in mastering foundational mathematics concepts, essential for improving mathematics education, particularly given the prominent gaps in students' basic knowledge and preparedness (Ignacio & Bajet, 2025).

Therefore, learners' dilemma in learning mathematical concepts remains a topic for research at various levels of education despite several approaches that have been suggested to boost mathematical proficiency, creativity, and instruction. Hence, this wide-ranging scenario addresses the key components of learners' self-efficacy in learning mathematical concepts as a relevant area for research, since learners' mathematical competencies are considerably related to their persistence, motivation, and academic achievement (Parojenog & Pabalan, 2024). Conceivably, learners with a high level of self-efficacy will have an edge to achieve the learning goal, compared with students with a low level of self-efficacy (Xiao et. al., 2021). Self-efficacy is not permanent, and it can be changed for the better (Riboroso, 2020). Some of the factors that may influence student self-efficacy are teachers, textbooks, learning strategies, and, most importantly, the use of everyday problems that exist around students in learning activities (Destiniar & Nopriyanti, 2024). In other words, educators and school leaders must understand how learners' self-efficacy affects educational outcomes, as this understanding gives them insight into how they might pave the way for eradicating the disparities in learning basic mathematical concepts. Their influence, in this regard, touches most, if not all, educational systems.

Generally, the literature reveals a persistent gap in understanding how students' difficulties in mathematics intersect with their self-efficacy, particularly at the high school level, and has highlighted the prevalence of mathematical challenges and their impact on academic outcomes. To address this gap, the present two-phase study investigated the difficulties encountered and self-efficacy in basic mathematical concepts among the public high school students at Macatingog Integrated School, Schools Division of Calbayog City. Specifically, it sought answers to the following questions: (1) What is the test performance in basic mathematical concepts of public high school learners? (2) What are the difficulties encountered in basic mathematical concepts of public high school learners? (3) What is the self-efficacy of public high school learners in learning mathematical concepts? and (4) What implications can be drawn from the findings of the study?

2.0 THEORITICAL FRAMEWORK

This study is anchored to Social Cognitive Theory (SCT), developed by psychologist Bandura (2014), which proposes that human behavior is based on a bi-directional connection between

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personal, cognitive factors, behavior, and environmental influences. This mechanism is referred to as reciprocal determinism, which implies that people are shaped not only by their environment but also by the way they react to and interpret their environment (Schunk, 2012). Moreover, the Self-Efficacy Theory of Bandura (1982) provides the basis for understanding learner motivation in learning mathematic. Clemente et. al. (2024) emphasized that Self-Efficacy Theory is an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments. Within the domain of mathematics education, it has been argued that Self-Efficacy Theory influences students' strategies for solving mathematical problems and their level of persistence, effort, and resilience when they encounter problems (Clemente et al., 2024).

3.0 LITERATURE REVIEW

Mathematics education plays a critical role in shaping not only the intellectual development of learners but also their capacity to navigate real-world challenges. As a foundational discipline, mathematics cultivates essential skills such as logical reasoning, analytical thinking, and problem-solving, which are indispensable for academic success and effective participation in a rapidly evolving society (Brezavšček et al., 2020). The subject fosters accuracy, consistency, and mental discipline, enabling individuals to address both routine and complex problems ethically and efficiently. Due to its centrality in scientific and technological advancement, educational authorities have long prioritized mathematics within the curriculum, recognizing its capacity to expand learners' abilities and contribute to holistic human development.

Nevertheless, unlike other subjects, Mathematics is especially highly challenging. Thus, the process of learning Mathematics requires students to use their intelligence and foundational knowledge of the subject. Students should possess three aspects of abilities: cognitive, affective, and psychomotor (Gunawan et. al., 2023) to achieve learning success. This framework aligns with UNESCO's Sustainable Development Goal under SDG 4.1a, an indicator that focuses on the minimum proficiency in Mathematics for students to be proficient in reading, writing, and comparing whole numbers up to 100, including adding and subtracting numbers within twenty, and solving application problems involving numbers within twenty. Students should also recognize simple shapes and their elements, read simple data displays, possess foundational knowledge of spatial orientation, and appraise the relative size of real-world objects (UNESCO Institute for Statistics, 2022). Hence, these strands will be used as the framework of basic mathematical concepts in this study. It is also noteworthy that, beyond conventional facts, the framework of mathematical concepts provides learners with the essential skills for decision-making, reasoning, and problem-solving to help them in many aspects of life.

Despite its pervasiveness, learning mathematical concepts is still an area that requires further investigation, especially in research locales where significant challenges arise due to the learning capabilities and self-efficacy of high school learners. Thus, this study provides a representation of this realm of scientific inquiry. Bandura (1972) defined self-efficacy as an individual's beliefs in their capabilities to accomplish tasks according to projected objectives. However, in this study, learners' beliefs and capabilities in learning mathematical concepts are dependent on the mathematical learning goals. This postulates that learners' self-efficacy has a positive impact on students' capability to utilize their proficiencies and, therefore, predicts their

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achievement. In other words, self-efficacy is imperative for learners, enabling them to relentlessly pursue assigned mathematical tasks. Thus, knowing how to do Mathematics is not merely enough; students also need to believe in the concepts and procedures that they are working with, which involves self-efficacy. For example, whether doing calculations manually or through a calculator, self-efficacy is involved. A student's self-efficacy in Mathematics is not permanent and can be improved (Riboroso, 2020). Research shows that students' self-efficacy can be enhanced using active learning to foster its development. Students who are developing self-efficacy are those whose conditions, both internal and environmental, support their development (Riboroso, 2020; Hanifa, 2021). Some of the factors that may influence student self-efficacy include teachers, textbooks, learning strategies, and, most importantly, the use of everyday problems relevant to students in learning activities (Destiniar & Nopriyanti, 2024).

Therefore, it is imperative that learners with a high level of self-efficacy l have an edge in achieving the learning goal, compared with students with a low level of self-efficacy. For instance, evidence from the study of Putri and Prabawanto (2019) concerning the analysis of students' self-efficacy in learning Mathematics, determined that students have low self-efficacy since most high school students have less self-confidence in solving mathematical problems and engaging in peer discussion during classes. Interestingly, findings highlighted that there was no connection between learners' self-efficacy and their cognitive level, which means that learners with high self-efficacy do not necessarily have a high cognitive level, and vice versa. Likewise, Holenstein et al. (2021) underscored that self-efficacy would serve as an arbitrator in the outcome of school grades in mathematics. It is undeniable that students are eager to learn Mathematics in a blended learning approach because they are more motivated, supported by their peers, or have higher self-esteem (Hufana & Gurat, 2023). Interestingly, Hiller et al. (2021) indicated in their study that one of the predictors of learners' self-efficacy is the presence of a strong interaction effect between Mathematics self-efficacy and learners' socioeconomic status. In other words, there is a broad range of emotional factors that affect learning in Mathematics in any modality. So, given this evidence, self-efficacy could be the best predictor for student achievement, such as mathematical perception.

Moreover, within the Philippine framework, as the standard of quality in the basic education system has become a growing issue, several factors must be considered to ensure that schools continue to focus on and improve effective pedagogical approaches, differentiated instruction, and sufficient and appropriate instructional materials for both students and teachers. In fact, Section 7 of Philippine Republic Act No. 10533, An Act Enhancing the Philippine Basic Education System, stresses the need to ensure that the enhanced basic education program meets the demand for quality education, in collaboration with relevant partners in government, academe, industry, and non-government organizations, to meet the content and performance standards of the K to 12 basic curriculum (RA No. 10533, 2012). However, the K to 12 Program remains a subject of inquiry regarding its execution and efficiency. It continuously elicits different responses among various individuals, including teachers, students, and parents. Abragan et al. (2022) highlighted in their study that the implementation of the K-12 program in the Philippines revealed various problems that arose due to a lack of implementation and action plans from the government.

Accordingly, this wide-ranging scenario addresses key components for enhancing the Philippine basic education system, such as curriculum and pedagogy, teacher quality, access to education, and parental involvement. Such a framework requires the collaboration and cooperation of all government agencies, including stakeholders, educators, students, and parents, to achieve sustainable and long-term improvements in the basic education system (Parojenog & Pabalan, 2024). Yet, from the education boards and policymakers, who identify key issues within the education system, down to the students, the ultimate recipients, these educational policies have not manifested enormous changes on the ground. According to Gumarang & Gumarang (2021), the three major problems in the Philippine education system are overcrowded classrooms, teachers teaching subjects outside their expertise, and poor quality of instruction. In effect, the learners, who are the focal point of the educational process, severely endure the problems that have plagued the country for decades.

In summary, the reviewed literature highlights the importance of Mathematics education in promoting not only cognitive and analytical skills but also in preparing learners for the demands of modern society. Despite reforms in curriculum and teaching strategies aimed at enhancing mathematical proficiency, national and international assessments in the Philippine context have consistently revealed low performance levels and significant learning gaps among students. These challenges are compounded by factors such as limited basic knowledge, insufficient preparedness, and varying degrees of self-efficacy, a factor increasingly recognized as a significant determinant of achievement in Mathematics. Current research further highlights that self-efficacy is not sufficiently established; however, gaps in the literature persist regarding how these factors interact in specific local contexts, such as public high schools in Calbayog City, and how targeted interventions can best be designed to address both cognitive and affective dimensions of Mathematics learning. Therefore, this study aims to investigate students' self-efficacy and their difficulties in learning basic mathematical concepts, with the ultimate goal of informing contextually relevant interventions that will enhance mathematical achievement and engagement among Filipino high school learners.

4.0 RESEARCH METHODOLOGY

4.1 Design of the Study

This study employed a sequential-explanatory mixed methods design, which involves the collection and analysis of quantitative data in the first phase, followed by qualitative data in the second phase, to explain and elaborate on the initial results (Creswell et. al., 2003). This design is appropriate for the study as it first determined the learners' test performance in basic mathematical concepts using a diagnostic test, and subsequently explored, through interview transcripts, the underlying difficulties and levels of self-efficacy that may explain such performance, thereby providing a more comprehensive understanding of the phenomena under investigation.

4.2 Population of the Study

The researcher identified 133 high school learners from Grades 7 to 10 as respondents who were officially enrolled during the school year 2025-2026 at the Macatingog Integrated School, Oquendo III District, Division of Calbayog City. Among 133 high school learners, the highest number of participants (44 or 33.08 percent) are from Grade 9, followed by Grade 10 (32 or

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24.06 percent), and Grade 8 (30 or 22.56 percent). The majority of respondents are female (79 or 59.39 percent), while 54 or 40.60 percent are male. Purposive sampling was used to select respondents who had been specifically identified by the researcher. Only regular students who attended classes, participated in standard academic activities, and voluntarily agreed to participate, with informed consent from their parents or guardians, were considered. In the second phase of this study, the selection of sixteen (16) respondents for the Key Informant Interviews (KII) was guided by purposive sampling to ensure the inclusion of individuals who could provide insightful perspectives regarding learners' difficulties and self-efficacy in Mathematics.

4.3 Research Instrumentation

The researcher has developed two sets of research instruments with the assistance of the adviser and subject experts. The first questionnaire is the Mathematics Diagnostic Test designed to identify learners' understanding of basic mathematical concepts. This 30-item multiple-choice test is based on the competencies issued by the Department of Education (DepEd) and is labeled the K to 12 Curriculum Guide for Mathematics Grade 7 to 10 (DepEd, 2016). The mathematics diagnostic test, encompasses key competencies, highlighting the areas of emphasis for assessment, targeting algebraic skills such as solving linear equations, simplifying and multiplying algebraic expressions, factoring polynomials, and interpreting linear functions, indicating a strong focus on algebra. Another substantial segment is devoted to number operations and pre-algebra skills, including order of operations, LCM and GCF, fractions, decimals, reciprocals, exponents, and scientific notation, which underscores the importance placed on the fundamental concepts. The second instrument is the Key Informant Interview (KII), which comprises two core research questions designed to elicit fundamental insights into how students experience Mathematics and how their beliefs about their abilities influence their learning.

4.4 Data Analysis

This study followed a sequential-explanatory approach in data analysis, consisting of quantitative analysis in the first phase, qualitative analysis in the second phase, and integration of results at the final stage. In Phase 1, learners' test performance in the mathematics diagnostic test was analyzed using descriptive statistics, specifically frequency counts, percentages, weighted mean, and standard deviation to determine the level of performance. The scores from the 30-item test were transmuted into percentage ratings based on the DepEd transmutation table (DepEd, 2020). In Phase 2, qualitative data from KII transcripts were analyzed following a systematic process of initial noting, developing emergent themes, clustering of emergent themes into superordinate themes, and cross-case pattern analysis. Finally, the results from both phases were integrated to provide a deeper and more comprehensive understanding of learners' mathematical performance in relation to their experienced difficulties and levels of self-efficacy.

5.0 RESULTS AND DISCUSSION

5.1 Test Performance in Basic Mathematical Concepts of Public High School Learners

Table 1 demonstrates that the majority of public high school learners in Macatingog Integrated School demonstrated low performance in Mathematics, with a mean of 63.45 (SD =13.012). Out of 133 respondents, 100 (75.19%) were classified as "Did Not Meet Expectations." This indicates that a substantial proportion of learners were unable to achieve the minimum required level of proficiency in basic mathematical concepts, suggesting significant gaps in their foundational knowledge and skills. Only a small percentage of students performed at satisfactory and higher levels. Specifically, 13 learners (9.77%) were classified as Unsatisfactory, while 5 (3.76%) achieved Satisfactory, 6 (4.51%) reached Very Satisfactory, and only 9 students (6.77%) attained an Outstanding level.

Table 1: Frequency and percentage distribution on test performance in basic Mathematical concepts of public high school learners (n=133)

Range	Frequency	Percentage	Performance Interpretation
90 – 100	9	6.77	Outstanding
85 – 89	6	4.51	Very Satisfactory
80 – 84	5	3.76	Satisfactory
75 – 79	13	9.77	Unsatisfactory
Below 75	100	75.19	Did Not Meet Expectations
Total	**133** **Mean=63.45**	**100.00** ***SD*=13.012**	**Did Not Meet Expectation**

These findings emphasize the need for targeted instructional interventions, such as remediation programs and differentiated teaching strategies, to address the diverse learning needs of learners. Consequently, these results corroborate the findings of Ignacio and Bajet (2025), which emphasized the critical need, particularly in the public schools of Calbayog City, Samar, to identify the difficulties high school students face in learning basic mathematics concepts and to find solutions to improve mathematics education. Their study also highlighted significant challenges such as gaps in foundational knowledge, insufficient preparedness, and difficulty adapting to the increased academic demands of the senior high school program. More importantly, these wide-ranging results challenge the key components of the vision for DepEd's K to 12 Basic Education Curriculum for Grades 7 to 10 Mathematics, particularly in achieving the goal by teaching solid mathematical content, such as an understanding of fundamental ideas (DepEd, 2016). In fact, it has been emphasized that students must be proficient in computing, problem-solving, representing ideas and concepts, and in connecting mathematics to other areas of life, regardless of ability levels and learning styles.

5.2 Encountered Difficulties in Basic Mathematical Concepts of Public High School Learners

To explore the difficulties encountered figuring out basic Mathematics of public high school students who belong to KII, this section demonstrates learners' personal experience in understanding, application thinking, and the difficulties they encountered.

Cognitive Challenges. Learners consistently demonstrated difficulties rooted in gaps in foundational knowledge, limited procedural understanding, and weak retention of previously learned concepts. Across responses, students struggled with essential topics such as fractions, factoring, and problem solving, often expressing confusion about where to begin or which steps to follow. These challenges point to fragile cognitive structures, where prior knowledge is either insufficient or not well integrated, making it difficult for learners to apply concepts in new situations. The recurring experience of "not knowing what to do" suggests cognitive overload, especially when tasks require multiple steps or abstract reasoning. These findings indicate that learners' mathematical difficulties are strongly linked to underdeveloped conceptual and procedural schemas, which hinder independent problem-solving and deeper understanding. The following verbatim excerpts illustrate learners' cognitive challenges in understanding and applying basic mathematical concepts.

> "LCM, FRACTION, FACTORING… PROBLEM SOLVING… I cannot understand the problem." (I1)
> "I don't understand the other problem on how to solve it because I forgot the lesson." (I2)
> "I don't know what to do because I am confused." (I3)
> "I experience difficulties in studying math." (I4)
> "Some topics I don't understand and I forgot easily." (I6)
> "I am confused of solving mathematics." (I7)
> "I didn't know how to solve it." (I9)
> "I experience struggles in math subject." (I11)
> "I forgot easily that's why I get confused." (I12)
> "I feel that all is possible answer… I get confused." (I14)
> "I am low in understanding mathematics." (I15)
> "I don't know what to do in solving the problem." (I16)

Affective Barriers. Beyond cognitive difficulties, learners' experiences were strongly shaped by emotional factors such as anxiety, low confidence, and negative beliefs about their mathematical abilities. Many students expressed persistent feelings of uncertainty, nervousness, and discomfort when engaging with mathematical tasks, particularly when required to respond publicly. These emotional responses often stem from repeated experiences of difficulty, which in turn reinforce a perception that mathematics is inherently hard. The presence of a fixed mindset further limits students' willingness to persist, as they begin to associate their struggles with a lack of ability rather than an opportunity for growth. Consequently, affective barriers not only accompany cognitive challenges but also intensify them by reducing motivation, confidence, and resilience in learning. The following verbatim excerpts reflect the emotional and psychological barriers experienced by learners in mathematics.

> "I feel unsure of my answer." (I3)
> "I feel unsure and anxious… not comfortable with my answer." (I4)
> "I feel unsure because I'm scared…" (I5)
> "I feel unsure and anxious because I am struggling." (I6)
> "I feel unsure… not comfortable getting the correct answer." (I7)
> "I feel unsure and anxious because I get nervous." (I9)
> "I feel scared and uncomfortable." (I10)
> "Math is very hard." (I11)
> "I feel unsure and anxious because of lack of knowledge." (I12)

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Social Pressures. Learners' difficulties in mathematics were also influenced by the social dynamics of the classroom, particularly the fear of negative evaluation from peers. Several respondents expressed concern about being laughed at, judged, or labeled negatively when providing incorrect answers. This fear creates a psychologically unsafe learning environment, where students become reluctant to participate, ask questions, or engage in problem-solving activities. As a result, opportunities for practice and feedback are reduced, further limiting learning. Social pressures thus act as a barrier to active engagement, reinforcing both cognitive and affective difficulties by discouraging students from taking risks necessary for meaningful learning. The following verbatim excerpts highlight the impact of peer-related pressures on learners' participation in mathematics.

> "I'm scared my classmates laugh at me." (I5)
> "I don't like to participate in class." (I5)
> "I feel shy… classmates will bully me." (I8)
> "They will call me stupid." (I8)
> "I get nervous when my teacher calls me." (I9)
> "I'm scared of getting a wrong answer and my classmates judge me." (I13)

Learning Environment. The findings also point to the role of the classroom environment in shaping learners' mathematical experiences. Distractions such as noise and lack of focus were identified as factors that hinder concentration and comprehension. For some learners, the inability to focus due to external conditions exacerbates existing cognitive and emotional difficulties, making it even more challenging to engage with mathematical tasks. This suggests that effective learning is not only dependent on instructional strategies but also on the quality of the learning environment, including classroom management and the establishment of conditions conducive to sustained attention. The following verbatim excerpts demonstrate how environmental factors affect learners' ability to focus and learn mathematics.

> "If it is noisy, I get distracted and can't focus." (I15)
> "I can't focus to learn mathematics." (I15)

Instructional Needs. Learners consistently expressed the need for instructional approaches that are clear, structured, and supportive of their learning needs. Many emphasized the importance of step-by-step explanations, additional examples, guided practice, and opportunities for active participation. These preferences indicate that learners benefit from scaffolded instruction that gradually builds understanding and confidence. The call for more practice and meaningful learning experiences also suggests a desire for deeper engagement with the material rather than surface-level exposure. Addressing these instructional needs is essential for bridging cognitive gaps, reducing anxiety, and promoting more effective and sustained learning in mathematics. The following verbatim excerpts illustrate learners expressed needs for instructional support in mathematics.

> "Clear discussion and step by step process." (I1)
> "More examples, active participation and step by step process." (I2)
> "More examples and practice until I master the lesson." (I3)
> "Step by step discussion, tutorial and more examples." (I4)
> "More examples and tutorial strategy." (I5)
> "I want to learn every day in mathematics." (I8)

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“Focus discussion, more examples and step by step process.” (I9)
“More examples and practice… no distraction.” (I10)
“Group activity, more examples and practice.” (I11)
“Meaningful learning… more examples and practice.” (I12)

The overall findings are supported by several recent studies that emphasize the multidimensional nature of mathematical learning difficulties. Research has shown that weak foundational knowledge and procedural confusion significantly predict poor mathematics performance among secondary learners (Namkung et al., 2020; Rittle-Johnson et al., 2020). Additionally, studies highlight that mathematics anxiety and low self-efficacy negatively affect students’ engagement and achievement (Carey et al., 2020; Dowker et al., 2020). In the Philippine context, recent research also indicates that learners’ fear of peer judgment and limited participation contribute to persistent difficulties in mathematics classrooms (Bernardo et al., 2021). Furthermore, the importance of structured and scaffolded instruction has been emphasized as a key factor in improving conceptual understanding and reducing learning gaps (OECD, 2023). These studies corroborate the present findings, affirming that addressing mathematical difficulties requires integrated interventions targeting cognitive, affective, social, and instructional dimensions of learning.

5.3 Self-Efficacy of Public High School Learners in Learning Mathematical Concepts

Confidence Levels. Learners’ self-efficacy in mathematics is generally situated at a moderate but fragile level, with most participants rating themselves between 4 and 6 out of 10. This suggests that while students do not entirely lack confidence, their belief in their ability is tentative and easily influenced by task difficulty or prior success. The frequent qualification of confidence using terms such as “somewhat” reflects uncertainty and hesitation, indicating that learners’ self-perceptions are not firmly established. Those with very low ratings (e.g., 1–2 out of 10) demonstrate particularly weak self-belief, often associated with a tendency to disengage or give up. Overall, confidence appears to be conditional rather than stable, shaped by learners’ immediate experiences and perceived competence. The following verbatim excerpts illustrate learners’ expressed levels of confidence in mathematics.

“5 out of 10 – somewhat confident.” (I1)
“5 out of 10 – confident.” (I2)
“1 out of 10 – not confident.” (I4)
“2 out of 10 – somewhat confident.” (I5)
“1 out of 10 – not confident.” (I16)

Cognitive Strategies. Learners demonstrate the use of basic but functional cognitive strategies when solving mathematical problems, most commonly reading and understanding the problem before applying learned procedures. The frequent mention of structured approaches, such as following steps or using rules like GEMDAS, indicates reliance on procedural knowledge. Some learners also exhibit emerging metacognitive behaviors, such as checking their answers and ensuring correctness, suggesting a developing awareness of their own thinking processes. However, these strategies remain largely surface-level and are often dependent on guidance, indicating that deeper conceptual understanding is still developing. The following verbatim excerpts reflect learners’ cognitive approaches to solving mathematical problems.

"I read the questions thoroughly so I can understand them." (I1)
"Read and understand the problem. Then solve." (I2)
"Using the GEMDAS and read and understand the problem." (I3)
"Study again and again… identify what is asked." (I6)
"Read and understand the problem. Then solve and show my solution." (I7)
"I observe my classmate on how to answer." (I9)
"Check my answer to make sure if my answer is correct." (I10)
"Try another method until I get the correct answer." (I14)

Persistence Patterns. Learners exhibit inconsistent patterns of persistence, reflecting varying levels of resilience when faced with mathematical difficulty. Some participants demonstrate determination by continuing to try different approaches or seeking help before giving up, indicating the development of perseverance. Others, however, admit to giving up more readily, especially when tasks become challenging. This fluctuation suggests that persistence is not yet internalized as a stable learning behavior but is influenced by factors such as task difficulty, confidence level, and available support. Notably, a few learners show a conscious decision to persist. The following verbatim excerpts illustrate learners' persistence and responses to difficulty.

"Sometimes, I don't give up." (I1)
"I try the different method." (I2)
"Sometimes, I don't give up." (I3)
"Yes, I give up." (I4)
"Sometimes, I ask for help." (I5)
"I don't give up because I know I can do it." (I7)
"If I'm not sure… I ask my seatmates." (I8)
"I keep doing my best before I give up." (I10)
"Sometimes I give up because I struggle." (I11)
"I'm not giving up even if it is difficult." (I12)
"I choose not to give up." (I13)
"I try another method until I get the correct answer." (I14)
"Sometimes I give up because I feel embarrassed." (I15)

Social Support. Social support emerges as a central factor shaping learners' self-efficacy, with many students relying on teachers, classmates, and even digital resources to navigate mathematical tasks. Help-seeking is a common strategy, suggesting that confidence is often built through interaction rather than independent effort. Observing peers, asking questions, and receiving guidance from teachers contribute to learners' ability to persist and complete tasks. This indicates that self-efficacy is socially constructed and reinforced, with collaborative learning environments playing a crucial role in sustaining engagement and understanding. The following verbatim excerpts highlight the role of social support in learners' mathematical learning.

"I asked for help to my classmates and teacher." (I1)
"Ask for help to my classmates and math teacher." (I2)
"Watching tutorial videos." (I3)
"Ask for help to my math teacher." (I5)
"Ask help first to my classmate and teacher." (I6)

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"With the help of our math teacher and classmates." (I7)
"I ask my seatmates." (I8)
"I ask to my teacher." (I9)
"I feel embarrassed asking." (I15)

Emotional Barriers. Emotional factors, particularly fear, embarrassment, and negative beliefs about mathematics, significantly influence learners' self-efficacy. Some students avoid seeking help due to embarrassment, while others internalize the belief that mathematics is inherently difficult, leading to disengagement. These emotional barriers undermine confidence and reduce persistence, even when support is available. The presence of such barriers indicates that self-efficacy is not solely determined by ability or strategy use but is deeply affected by learners' emotional experiences and perceptions of themselves as mathematics learners. The following verbatim excerpts demonstrate the emotional challenges affecting learners' self-efficacy.

"I give up because I feel embarrassed." (I15)
"I give up because math is hard for me." (I16)
"Sometimes I give up because I struggle." (I11)
"Sometimes, I give up on the other activities." (I10)

These findings are consistent with recent research emphasizing the central role of self-efficacy in mathematics learning. Studies have shown that moderate, yet unstable self-efficacy is common among secondary learners and is closely linked to their use of procedural strategies rather than deep conceptual understanding (Pajares & Miller, 2020; Schukajlow et al., 2020). Research also indicates that persistence in mathematics is strongly influenced by self-efficacy beliefs, with students who demonstrate higher confidence more likely to engage in sustained effort and adaptive problem-solving (Mutodi & Ngirande, 2019). Furthermore, the role of social support has been highlighted in shaping learners' confidence, particularly in collaborative and teacher-supported environments (Doménech-Betoret et al., 2020). In the Philippine context, studies have similarly found that students' self-efficacy is significantly influenced by teacher encouragement, peer interaction, and emotional factors such as anxiety and embarrassment (Datu & Yang, 2021). These studies support the present findings, affirming that enhancing learners' self-efficacy requires addressing not only cognitive strategies but also motivational, emotional, and social dimensions of learning.

5.4 Key Implications Drawn from the Findings of the Study

The key implications drawn from the findings of the study, highlighting how learners' difficulties in basic mathematical concepts and their self-efficacy in Mathematics inform instructional practices, classroom support, and policy directions, show that improving learners' performance requires more than content coverage. It demands a strengthening of foundational understanding alongside supportive learning conditions. The dominance of cognitive challenges indicates a need for instructional designs that prioritize conceptual clarity, scaffolded progression, and deliberate practice, rather than procedural memorization alone. At the same time, the presence of affective barriers and social pressures suggests that teachers must cultivate a psychologically safe classroom environment where mistakes are treated as part of learning, thereby reducing anxiety and fear of judgment. Instruction should also integrate formative feedback, differentiated support, and opportunities for active participation to address diverse learner needs. Moreover, the influence of environmental and instructional factors

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highlights the importance of structured classroom management and consistent teaching approaches that reinforce focus and engagement.

The findings on self-efficacy further imply that learners' confidence in mathematics must be intentionally developed through both instructional practices and social support systems. The generally moderate yet fragile self-efficacy levels suggest that students need repeated opportunities to experience success through guided tasks, incremental challenges, and constructive feedback that reinforce their sense of competence. The reliance on cognitive strategies and external support indicates that learners benefit from explicit modeling of problem-solving processes, as well as collaborative learning environments that encourage peer interaction and help-seeking behaviors. However, the inconsistency in persistence and the presence of emotional barriers highlight the need to strengthen learners' resilience, motivation, and growth-oriented beliefs about mathematics. Teachers play a critical role in this process by fostering encouragement, recognizing effort, and reducing stigma associated with errors or asking for help.

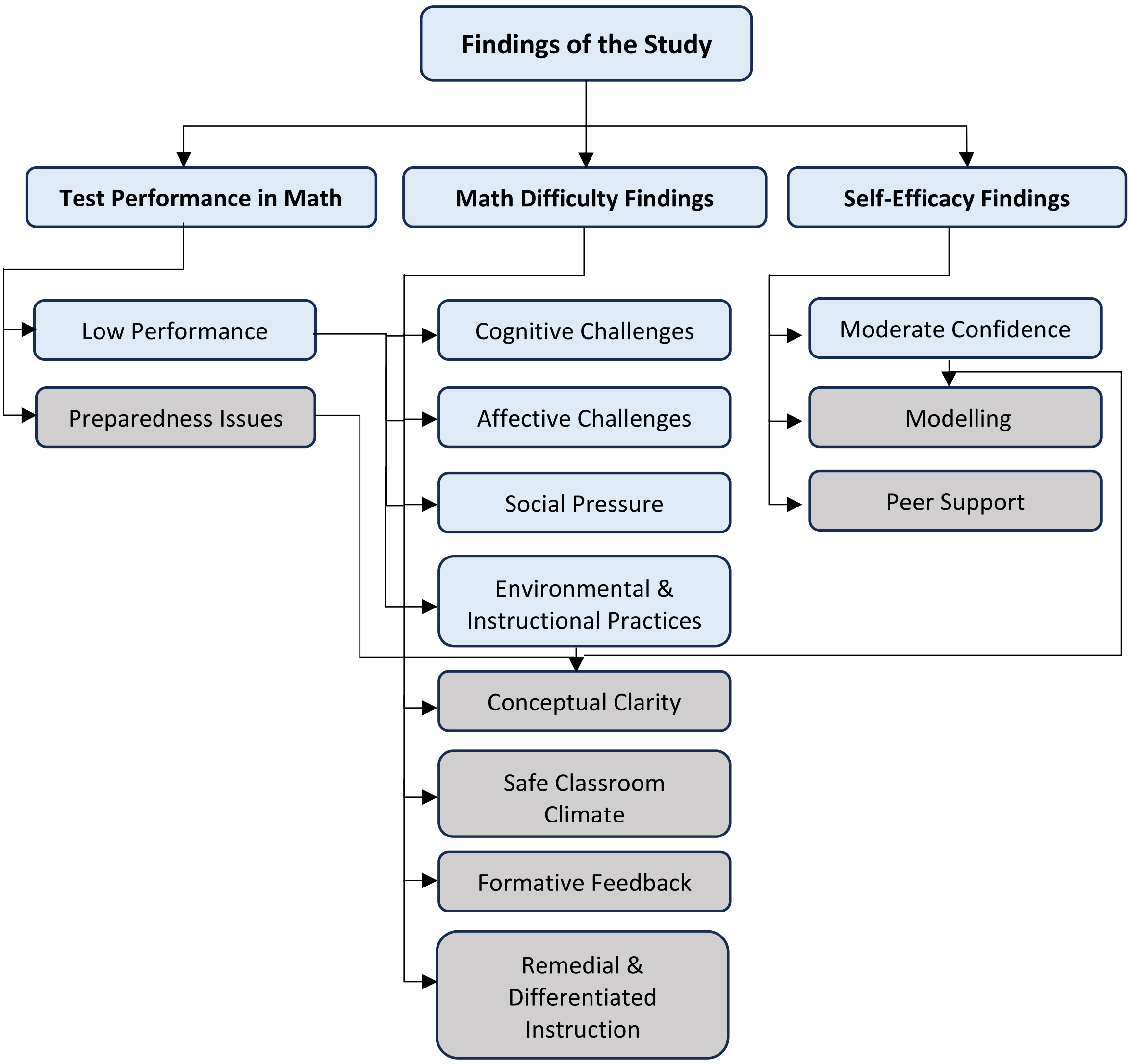

Figure 1. Key implications drawn from the findings of the study

6.0 CONCLUSIONS AND RECOMMENDATIONS

The test performance in basic mathematical concepts of public high school learners in Macatingog Integrated School, Oquendo III District, Schools Division of Calbayog City, demonstrated that most learners had poor mastery of basic mathematical concepts, with a substantial proportion failing to meet the expected proficiency standards. This reflected a serious gap in foundational understanding and skills retention, suggesting persistent challenges in conceptual comprehension, problem-solving, and procedural application. Subsequently, the difficulties encountered by public high school learners in basic mathematical concepts were multifaceted, arising from cognitive, affective, social, and instructional factors. The dominance of cognitive challenges, such as weak conceptual understanding and procedural misunderstanding, was compounded by emotional barriers like anxiety and low self-confidence, as well as social pressures and insufficiently supportive instructional approaches. This underscored the need for holistic, responsive interventions that addressed not only academic skills but also emotional support, social dynamics, and effective pedagogy. Lastly, the self-efficacy of public high school learners in Mathematics was characterized by moderate yet unstable confidence, affected by a reliance on procedural strategies and strong dependence on social support. While learners exhibited some belief in their mathematical abilities, this self-efficacy was weak and often externally reinforced, resulting in vulnerability to emotional barriers such as anxiety and fear of failure.

Based on the findings and conclusions of the study, the following recommendations are propose: (1) Implement institutionalized remedial or intervention programs and differentiated instruction to address foundational gaps in basic concepts concentrating on learners from KII or those who did not meet proficiency standards; (2) Regulate DepEd learners' promotional policy focusing those who have not yet acquired the fundamental skills in Mathematics which should not be promoted to the next grade level until sufficient remediation and mastery of essential mathematical concepts are guaranteed; (3) Cultivate a supportive classroom environment where mistakes are normalized as part of the learning process, reducing anxiety and encouraging students to take academic risks; (4) Provide formative, specific, and constructive feedback regularly, and differentiate support based on individual learner needs to ensure all students receive appropriate guidance and encouragement; (5) Leverage learners' self-efficacy with resilient help-seeking behaviors by coaching leaners in adaptive strategies, including teacher or peer support networks and external access to resources for stronger Mathematics self-efficacy and to become more independent and effective problem solvers; (6) Infuse DepEd's Early Language Literacy and Numeracy (ELLN) teacher training programs with strategies to address not only cognitive difficulties but also the emotional and social aspects of learning Mathematics to address positive classroom climate, and supportive learning conditions at the very early stage; (7) Revisit and strengthen the policy implementation of DepEd Rapid Mathematics Assessment (RMA) and Phil-IRI program for high school learners by expanding teacher-guided self-efficacy enhancement activities, including reflective learning journals, confidence-building exercises, and feedback-focused activities. This would make the assessment process more holistic, bridging cognitive measurement and affective development; (8) Establish a multi-stakeholder group such as school, parents, LGUs, NGOs, private sectors, for joint interventions to implement home practice interventions, community distraction-free study spaces, NGOs fund resource centers, and math fairs to address foundational gaps and build learner confidence through collective reinforcement; and (9) Replicate this study in other

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public high schools within the region using the same diagnostic tests and self-efficacy assessment to enable comparative analysis of mathematical difficulties and performance gaps, identifying region-wide patterns influenced by local contexts like resource availability or teacher training levels.

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