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Drivers of Numeracy Skills Among Grade 2 Learners In Butuan City Division: A Mixed-Method Study

Arlyn Jane C. Payao[1*], Annabelle M. Dorado, PhD[2]

[1,2]*Saint Joseph Institute of Technology, Butuan City, Philippines*

[*]*Corresponding author, arlynjane.payao@deped.gov.ph*

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Abstract

This study investigated the drivers of numeracy skills among Grade 2 learners in the Butuan City Division using a convergent parallel mixed-method design. Quantitative data were gathered from 364 households through stratified random sampling to examine the influence of cognitive development, anxiety toward numbers, home environment, parental involvement, socio-economic status, and teacher-related factors on learners' numeracy skills. A Rapid Mathematics Assessment (RMA) was administered to assess learners' proficiency levels. At the same time, qualitative data were collected through semi-structured interviews with teachers and parents to gain deeper insights into numeracy-related challenges. Findings revealed that 51% of learners were classified as low proficient, indicating significant gaps in foundational numeracy competencies. Home environment and parental involvement showed positive and significant relationships with numeracy skills, whereas anxiety toward numbers demonstrated a negative correlation. Parental educational attainment emerged as the only socio-demographic predictor significantly associated with numeracy performance. Teacher competence, curriculum, and instructional efforts were highly evident but did not significantly influence low RMA scores. Qualitative findings emphasized limited parental time, insufficient educational resources, and inadequate home support as barriers to numeracy development. The study highlights the importance of strengthening home-school partnerships and developing intervention programs that promote parental involvement and supportive learning environments to improve numeracy outcomes among learners.

Keywords: Numeracy Skills, Parental Involvement, Home Environment, Grade 2 Learners, Mixed-Method Study

Introduction

Foundational competencies in numeracy are essential for preparing every learner for the demands of the higher rungs of the educational ladder. At the global level, numeracy is a common challenge in many schools. Drivers of numeracy skills occur when a learner's actual numeracy skills at a given grade level are lower than the curriculum's expectations (Luu-Thi et al., 2021).In another study by Dionanga and Cajandig (2025), the authors note that Mathematics education faces profound global challenges, as documented by major international assessments. Results from the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) consistently show that many learners struggle

to master basic skills essential for both academic and everyday tasks. These global benchmarks have become essential tools for understanding the scope and nature of numeracy gaps worldwide.

In the Philippine setting, the numerical proficiency of Filipino learners is coupled with serious issues as reflected in both national and international assessments. According to the 2022 Program for International Student Assessment (PISA) results, learners in the Philippines scored below the OECD average in mathematics, reading, and science. In addition, a smaller proportion of learners in the Philippines than on average across OECD countries were top performers (Level 5 or 6) in at least one subject (Jabanes & Futalan, 2025).

Results from the Rapid Mathematics Assessment (RMA) for grades 1 to 3 in School Year (SY) 2024-2025 showed that nearly 45% of K to 3 learners scored below the standard. This is consistently observed across schools and divisions. Most of these learners are from far-flung schools. More specifically, the RMA findings highlight the dismal performance of most Filipino learners in concepts related to time measurement, linear measurement, and fractions (DepEd RMA Results, 2025). The national and international assessment programs presented above suggest that many Filipino learners demonstrate low numeracy proficiency. In the literature, key contributing factors to the significant numeracy problem include resource constraints in schools, inadequate support for numeracy at home, outdated curricula, a significant learning gap caused by the COVID-19 pandemic's disruption of in-person learning, and a historical shift away from a subsistence economy. These issues lead to a high percentage of students lacking foundational math skills appropriate for their grade levels.

Because of the evident problems in the early numeracy of Filipino learners, the Department of Education (DepEd) has implemented strategies and initiatives to improve the foundational numeracy skills of K to 3 learners. The implementation of the MATATAG Curriculum and school-level initiatives is the most recent strategic intervention of DepEd to address early drivers of numeracy skills. The Republic Act No. 12028, also known as the Academic Recovery and Accessible Learning (ARAL) Program Act, is a Philippine law signed on October 18, 2024, to address the national "learning poverty" crisis and pandemic-related learning losses. RA 12028 prioritizes the provision of free and effective national intervention for struggling learners who have not met the minimum proficiency levels in mathematics and other subjects—DepEd Order No. 20, s. The 2025 Policy on Medium of Instruction from Kindergarten to Grade 3 promotes effective, learner-centered teaching practices that support improvements in foundational learning outcomes, including numeracy development.

Despite DepEd's efforts, issues with the numeracy skills of elementary learners remained evident in many schools across the country. In particular, among the central schools of the Butuan City Division, the majority of Grade 2 learners showed dismal performance in the latest Rapid Mathematics Assessment (RMA) results. Data showed that the majority of learners did not hit the most essential competencies in several numeracy components. This recent finding on learners' numerical ability or proficiency has been consistent over the last five years.

While problems with numeracy skills, particularly among elementary learners, persist in many public schools across the country, no comprehensive research has yet been conducted on their drivers. Hence, this study generally aims to investigate the factors or drivers associated with numeracy problems among Grade 2 learners in selected public schools within the Butuan City Division. The study's findings will serve as a reference for developing appropriate intervention programs that will ultimately lead to significant improvements in learners' numerical competence and proficiency at the early stage of learning.

Related Studies

Numeracy skills in the early stages of education are essential for preparing learners for the challenges of the higher stages of the educational ladder. Deda et al. (2023) noted that in early childhood education, mathematical literacy, especially numeracy skills, was vital because it laid the groundwork for more advanced mathematical understanding.

Numeracy is commonly tagged as a skill that involves confidence and the ability to deal with numbers and measurements. It requires a working knowledge of the number system, computational skills, and the desire and capacity to solve numerical problems in various contexts. Numeracy also requires a practical understanding of how data is obtained through counting and measuring, and how it is presented or depicted in graphs, diagrams, charts, and tables. Additionally, Ayuwanti (2020) has highlighted the importance of early mathematical instruction for young children's developmental abilities, the impact of prior achievement on future academic success, and the need to focus on numeracy. However, some learners still have low numeracy skills.

Early math and numeracy are the general understanding of numbers and basic mathematical concepts. These are skills such as counting, comparing, describing shapes and positions, and problem solving. Learners who enter Kindergarten with low math skills tend to continue performing below their peers in later grades. Math learning and intervention need to happen before kindergarten. These learners, especially at-risk learners, need the opportunity to build a strong foundation at a young age.

Australian educational researchers believe that numeracy includes knowledge, skills, behaviors, and dispositions that learners need to apply in various situations (Tout et al., 2020). This includes acknowledging the role of mathematics in daily life and the tendency to use mathematical knowledge and skills in meaningful ways. Numeracy is a critical skill that builds bridges between mathematics and the real world (Tout et al., 2020).

Numeracy issues in the early years of education are evident across the globe. Studies have focused on identifying factors that contribute to poor numeracy among elementary learners. Latiban and Mendez (2022) identified environmental elements, particularly the social environment, as a determinant of numeracy acquisition, encompassing the child's interactions with peers in school and the community. The emotional climate reflects the extent to which a child's relational needs are met at home. They also asserted that a healthy learning environment is essential for a child in school and home settings.

Studies on learners' numeracy skills have sparked interest among many researchers. A significant driver of numeracy skills among grade 2 learners involves internal psychological factors. Studies show that low motivation to learn, mathematics anxiety, and low self-confidence are key internal factors contributing to inadequate numeracy development (Silfia et al., 2025). This psychological dimension is particularly important in the early grades, when learners' attitudes toward mathematics are forming.

Strickland et al. (2020) found that children's participation in numeracy activities at home and at the kindergarten level provides a noticeable boost to their performance at higher levels. Aunio et al. (2019) examined 442 first-grade students in South Africa. They found that perceptual and language skills, as well as the opportunity to learn mathematics in pre-school, are crucial factors influencing learners' numeracy skills in the first grade.

Hunt and Maloney (2022) indicated that prior math experience enhances the relationships among math anxiety, resilience, and attitudes. This concise conceptual framework integrates multiple dimensions,

providing a nuanced understanding of how learners navigate and excel in mathematics performance within the Cognitive Appraisal Theory.

Cognitive and developmental aspects play a crucial role in shaping numeracy skills. According to Sarmiento and Sarmiento (2020), learners' innate cognitive capacities, such as working memory, logical reasoning, and spatial awareness, are critical in understanding and applying mathematical concepts. These cognitive skills form the foundation on which formal and informal numeracy learning is built. Research suggests that early childhood experiences and the quality of preschool education are instrumental in fostering these cognitive competencies, thus affecting subsequent numeracy development (De Guzman & Mercado, 2021).

Math anxiety is an important factor affecting the acquisition of numeracy skills and achievement in mathematics. Math anxiety involves feelings of tension, worry, fear, or apprehension that arise when individuals engage in mathematical activities, affecting their cognitive functioning related to numbers and problem solving (OECD, 2023). Studies have found that math anxiety negatively affects students' confidence, motivation, working memory capacity, and achievement in mathematics (Barroso et al., 2021). When students experience high levels of math anxiety, they are likely to avoid mathematical activities and be less focused on their studies, which may prevent them from developing the numeracy skills they need (Namkung, Peng, & Lin, 2019; OECD, 2023). Additionally, math anxiety can stem from negative math experiences, fear of failure, classroom pressure, and assessments, making it an important emotional factor that affects children's numeracy outcomes (UNESCO, 2022).

Parental involvement is seen as a crucial element in the successful development of numeracy among children learning to perform various mathematical operations at an early age. Parents play a crucial role in the development of numeracy because a child's first experience with numeracy occurs in a home learning environment, where it is acquired through various daily activities (Daucourt et al., 2021). Parental involvement in learning activities, including counting, measuring, discussing numbers, and helping with homework, has been found to promote learners' achievements in mathematics. Additionally, parental support offers many opportunities to learn to solve mathematical tasks outside the classroom, thus playing an important role in the development of numeracy (Skwarchuk, Sowinski, and LeFevre, 2022). Recent studies have shown that parental neglect of numeracy activities and low engagement in learning result in poor numeracy achievement (Makig-Angay & Ligan, 2024; OECD, 2023). Therefore, parental involvement and a conducive learning environment are important parts of children's numeracy development and achievement.

Parents play a significant role in promoting children's numeracy skills by serving as motivators, educators, resource providers, and guides in learning mathematics. Parental involvement in numeracy activities at home, including counting, measuring, games, and problem solving, makes a significant contribution to the development of children's mathematical skills. Recent research has confirmed that parents' attitudes, knowledge, and participation in numeracy activities affect children's academic achievement (Daucourt et al., 2021). In addition, studies have shown that the presence of rich mathematical content in homes promotes the development of basic numeracy skills in children and prepares them for future formal education (Mutaf-Yıldız et al., 2020). Finally, participation in numeracy activities at home and in early childhood institutions improves children's mathematics achievements in later grades (Skwarchuk, Sowinski, & LeFevre, 2022; OECD, 2023).

Socioeconomic status (SES) is one of the key factors associated with learners' numeracy skills. There is clear evidence that children from low-income families are more likely to experience difficulties in developing basic numeracy skills due to limited access to educational resources, learning materials, technology, and

enrichment activities (OECD, 2023). Furthermore, individuals living in disadvantaged environments have fewer opportunities to engage in numeracy-based activities at home due to limited resources, which adversely affects their numeracy skills (UNESCO, 2022). Current research shows that learners from low-SES families have lower numeracy scores than other children because socioeconomic differences lead to unequal learning outcomes (Mullis et al., 2024).

Summarizing the discussions above, the development of numeracy skills among Filipino learners is multifaceted, involving cognitive abilities, socio-economic conditions, instructional quality, resource availability, and cultural influences. Addressing these factors holistically is vital in improving numeracy outcomes and ensuring equitable educational opportunities for all Filipino learners.

Various studies have examined predictors of learners' numeracy skills using quantitative approaches, and very few have employed a qualitative lens. This study employs a mixed-methods approach to understand the drivers of numeracy skills among Grade 2 learners in the Division of Butuan City.

Theoretical/Conceptual Framework

This study was anchored on Piaget's Developmental Constructivism Theory (1952), Kolb's Experiential Learning Theory (1984), and Bronfenbrenner's Ecological Systems Theory (1979). The theories provide an integrated view of the factors influencing numeracy development among Grade 2 learners.

Constructivist theory suggests that knowledge formation is active and depends on experiences gained through interactions between learners and their environment. According to Piaget (1952), knowledge is gradually formed across the different stages of learners' cognitive development. Mathematical skills cannot be acquired by simply memorizing them. They must be developed using an active approach to learning that includes exploration and reasoning. In relation to this research, Piaget's theory suggests how learners' cognitive development can be affected by mathematics anxiety. The fear, stress, or anxiety that learners feel about mathematical concepts can prevent them from developing mathematical knowledge.

In addition to Piaget's approach to learning, Kolb's Experiential Learning Theory (1984) emphasizes the fact that learning occurs through a process of changing experiences. According to Kolb, effective learning occurs through a cycle involving concrete experiences, reflective observation, abstract conceptualization, and active experimentation. For learners, most of their mathematical experiences occur in their local setting. Within this research context, learning theory helps to understand the importance of parental interaction and the influence of the local environment on the acquisition of mathematical skills. When parents teach children counting, math games, budgeting, measuring, and other math-related activities, they allow them to learn through relevant experiences.

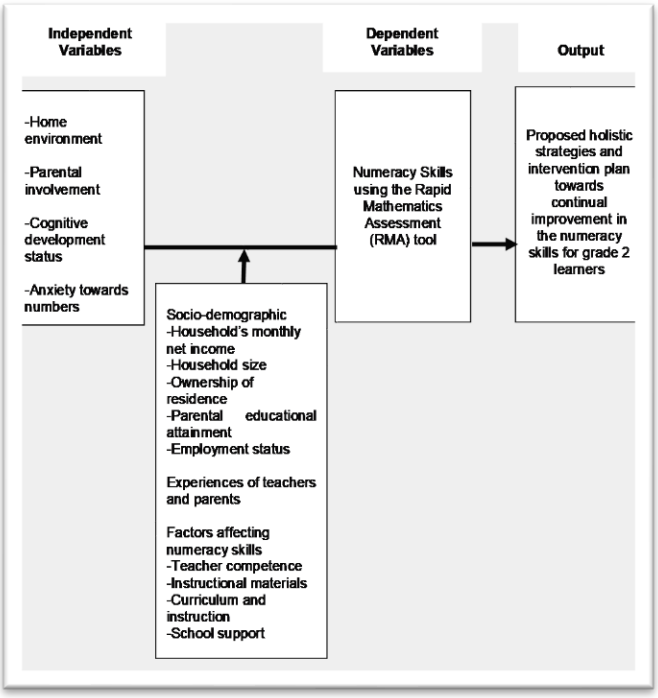
Furthermore, the findings from this research were supported by Urie Bronfenbrenner's Ecological Systems Theory (1979). In his theory, the author points out that many environmental systems play a major role in shaping children's development. Of all these environments, the microenvironment consisting of the home, parents, and school plays a significant role in directly influencing the child's learning process. This theory can be used to explain the effects of parental involvement and the home environment on numeracy achievement. Learners who grow up with supportive family relationships, access to good learning resources, and a positive learning environment at home develop stronger numeracy skills.

Based on the above theories, the researcher believes that the development of numeracy skills is affected by both internal and external factors. Piaget's theory helps explain internal cognitive and emotional factors, such as anxiety about mathematics. In contrast, Kolb's and Bronfenbrenner's theories help explain

external environmental factors, such as parental involvement in children's education. Together, the theories show that the drivers of numeracy skills arise from the combined effects of the learner's attitude towards mathematics and their exposure to it.

The conceptual research framework assumed that parental involvement, home environment, and anxiety towards numbers serve as predictor variables in the numeracy skills of Grade 2 learners. Numeracy skills serve as the dependent variable in the research, while the experiences and perspectives of both teachers and parents provide qualitative insights that explain the quantitative results. From the framework above, a favorable home environment and parental involvement contribute to the development of numeracy skills, while increased anxiety towards numbers hinders numeracy skills.

Figure 1. Research Paradigm Showing the Interplay Between Variables of the Study



Objectives of the Study

This study sought to identify the drivers or factors influencing the numeracy skills of Grade 2 learners in the central schools of the Butuan City Division. Specifically, it aimed to: (1) determine the socio-demographic profile of Grade 2 learners in terms of household monthly net income, household size, ownership of residence, parental educational attainment, and employment status; (2) assess the extent of manifestation of the drivers of numeracy skills as perceived by parents in terms of home environment and parental involvement, and as perceived by teachers in terms of anxiety toward numbers and cognitive development status; (3) determine the level of numeracy skills of Grade 2 learners using the Rapid Mathematics Assessment (RMA) tool; (4) examine the significant relationship between the socio-demographic profile and the level of numeracy skills of learners based on the RMA results; (5) determine the significant relationship between home environment, parental involvement, cognitive development, anxiety toward numbers, and the numeracy skills of learners; (6) assess the extent of manifestation of teacher-perceived drivers of numeracy skills in terms of teacher competence, instructional materials, curriculum and instruction, and school support; (7) determine the significant relationship between teacher-perceived factors and learners' numeracy skills; (8) explore teachers' experiences relative to numeracy skills among Grade 2 learners; (9) identify challenges that hinder parents in promoting early numeracy at home; (10) examine school practices that promote numeracy among learners; and (11) propose holistic strategies and action plans for the continual improvement of numeracy skills among Grade 2 learners.

Methodology

This study employed a convergent parallel mixed-methods design to investigate the drivers of numeracy skills among Grade 2 learners in the central schools of the Butuan City Division, in which quantitative and qualitative data were collected simultaneously to provide a comprehensive understanding of the phenomenon. Quantitative data were gathered from 364 Grade 2 learners and their parents through stratified random sampling across ten districts, while 49 teachers participated in the study. Survey questionnaires were utilized to assess socio-demographic characteristics, home environment, parental involvement, cognitive development status, anxiety toward numbers, teacher competence, instructional materials, curriculum and instruction, and school support. Learners' numeracy skills were measured using the Rapid Mathematics Assessment (RMA) results retrieved with appropriate school permission. Qualitative data were collected through semi-structured interviews with selected teachers and parents to explore their experiences, challenges, and school practices related to numeracy development. The research instruments underwent expert validation and reliability testing to ensure accuracy and consistency. Quantitative data were analyzed using frequencies, percentages, means, standard deviations, and Spearman's rho, while qualitative data were analyzed using thematic analysis following Braun and Clarke's framework. Findings from both strands were triangulated and integrated to develop holistic strategies and action plans for improving numeracy skills among Grade 2 learners.

Results and Discussion

Problem 1. What is the socio-demographic profile of Grade 2 learners in terms of household monthly net income, household size, residence ownership, parental educational attainment, and employment status?

Table 1 presents the frequency and percentage distribution of parent-respondents by socio-demographic profile, including income, residence, household size, educational attainment, and employment status.

Table 1. *Frequency and Percentage Distribution of Parent Respondents Across Profile*

Profile	Frequency	Percentage
Income Range		
Php 12,000 and below	1	0%
Php 12,001 – Php 20,000	192	53%
Php 20,001 – Php 35,000	101	28%
Php 35,001 – Php 60,000	52	14%
Php 60,001 and above	18	5%
Total	**364**	**100%**
Household Size		
1-5 members	232	64%
6-10 members	132	36%
Total	**364**	**100%**

House Ownership		
Owned	250	69%
Rented	31	9%
Living with Relatives	83	23%
Total	**364**	**100%**
Educational Attainment		
No formal schooling	3	1%
Elementary Graduate	28	8%
High School Graduate	140	38%
Vocational/Technical Course	62	17%
College Graduate	125	34%
Master's or Doctorate Degree	6	2%
Total	**364**	**100%**
Employment Status		
Full-time	148	41%
Part-time	88	24%
Self-employed	57	16%
Unemployed	65	18%
OFW	6	2%
Total	**364**	**100%**

Table 1 shows the distribution of parents by socio-economic profile. It can be observed that the majority, or 53% (192), of the households have a monthly income range of Php 12,00.00 to Php 20,00.00. This is followed by 28% (101) of households with incomes ranging from Php 20,001.00 to Php 35,000.00. The income distribution of households reflects the economic challenges and their potential implications for parents' involvement in their children's educational journey (Cooper & Pugh, 2020). When it comes to household size, the same table shows that the majority (64%; 232) of households have 1-5 members, while the remaining 36% (132) have 6-10 members. As for housing ownership, 69% (250) of households owned their homes.

In terms of educational attainment, the majority of parents are at most high school graduates only. This is evidenced by the percentage shares of 38% (140) and 17% (62) among parent respondents who are high school graduates and holders of vocational/technical courses, respectively. It is also noted that 34% (125) of the respondents are college graduates. Moreover, regarding employment status, 41% (148) and 24% (88) of the parents are employed full-time and part-time, respectively. A 16% share (57) comprises self-employed parents, while 19% (65) are unemployed. This educational and employment information is relevant in understanding numeracy-promoting opportunities at home. Arbuliente (2024) noted that economic activities largely hinder parental support for their children's education. Parents do not have the time to assist their children with learning at home due to work-related obligations (Ribeiro et al., 2021).

As applied to the study's framework, these demographic characteristics constitute the structural explanation of why the learners perceived a poor home learning environment and reported a high level of anxiety in math. It clearly shows the coexistence of economic restrictions and emotional blocks: parents who are struggling and have no time to provide learning support due to the nature of their work (Arbuliente, 2024; Ribeiro et al., 2021) are not in a position to assist with the socially mediated learning that Vygotsky advocates. If this lack of parental support is coupled with a low academic background, the home learning environment (microsystem in Bronfenbrenner) fails to provide role modeling in academic tasks, which helps prevent math anxiety in learners (Bandura). Therefore, socio-economic status acts not only as a descriptor but also as the very causal agent of learning deficits and affective distress among learners.

Problem 2. What is the extent of the following drivers of numeracy skills among Grade 2 learners, as perceived by parents in terms of home environment and parental involvement, and by teachers in terms of anxiety towards numbers and cognitive development status?

Table 2: *Extent of Manifestation of the Drivers of Numeracy Skills*

Items	Mean	Standard Deviation	Extent
Home Environment	2.17	1.10	Low
Parental Involvement	2.22	1.10	Low
Anxiety Towards Numbers	3.82	1.07	High
Cognitive Development	3.03	0.88	Average

Note: Mean scores falling within 1.00-1.79: Very Low, 1.80-2.59: Low, 2.60-3.39: Average, 3.40-4.19: High, 4.20-5.00: Very High

Table 2 summarizes the *variables.* As previously discussed, the table shows that the home environment and parental involvement are rated low. This implies that an intervention or strategy will promote parental involvement at home. Moreover, the high level of anxiety towards numbers also speaks of the need for appropriate actions. It is essential to note that anxiety can lead to a lack of confidence and interest among learners in learning mathematics in the future. Hence, this problem must be addressed as early as possible to increase the likelihood of addressing numeracy skills.

As the findings show, the learners' numeracy skills were largely dependent not only on their cognitive preparedness but also on the quality of their immediate environmental and socio-affective experiences. The study found that insufficient parental interaction, poor home math environment, low teacher support, and high math anxiety have a significant impact on learners' numeracy skills in grade 2. Piaget's Theory of Cognitive Development, rather than Bronfenbrenner's Ecological Systems Theory, can better explain this result. This theory posits that children develop mathematical ability through biologically scheduled stages of cognitive preparedness. It fails to explain how the child's environmental and socio-affective characteristics affect learners' math disposition, self-confidence, and math anxiety. Ecological Systems theory provides a better explanation because it emphasizes the important roles of the child's microsystem, namely the home, parents, school, and close social network, in influencing the child's learning and development. The study indicated that learners who lack an adequate home environment and academic support from parents have higher math anxiety and lower numeracy. This suggests that Bronfenbrenner's Ecological Systems theory

provides a better theoretical framework, as it captures how child-environment interactions affect numeracy and lead to differences in numeracy levels.

Problem 3. What are the numeracy levels of Grade 2 learners as measured by the Rapid Mathematics Assessment (RMA) tool?

At a central school in Butuan City, 364 Grade 2 learners served as respondents in the study, and their post-RMA scores were used to assess their basic math skills.

Table 3 presents the numeracy levels of Grade 2 learners as measured by the Rapid Mathematics Assessment (RMA) tool.

Table3. *Level of Numeracy Skills of the Grade 2 Learners Based on the Rapid Mathematics Assessment (RMA) Tool*

Descriptive Proficiency	Score Range	Frequency	Percentage
Not Proficient	< 25%	4	1%
Low Proficient	Between 25% and 49%	185	51%
Nearly Proficient	Between 50% and 74%	121	33%
Proficient	Between 75% and 84%	49	14%
Highly Proficient	Between 85% and 100%	5	1%
Total		**364**	**100%**

Note: Not Proficient describes those learners in Emerging who have significant struggles with the basic grade level math facts and procedures: Low Proficient describes learners in Emerging who can only manipulate math facts at a surface, unreliable, and superficial level: Nearly Proficient describes learners in Developing who are competent with simple calculation but lack ability in problem solving: Proficient describes those learners At Grade Level who have mastered all of the grade level math competencies expected: Highly Proficient describes learners Above Grade Level who exhibit a depth of reasoning and self-sufficiency in mathematics.

Table 3 presents the numeracy levels of Grade 2 learners as measured by the Rapid Mathematics Assessment (RMA) tool. The findings reveal that the majority of the 364 learners were classified at the "Low Proficient" level, with 185 learners (51%) scoring between 25% and 49%. This was followed by 121 learners (33%) who were categorized as "Nearly Proficient." On the other hand, only 49 learners, or 14%, scored at the "Proficient" level, and only 5 learners, or 1%, attained the "Highly Proficient" level. In addition, 4 learners (1%) were classified as "Not Proficient." These results indicate that most Grade 2 learners still struggle with foundational numeracy competencies and require further support in mastering basic mathematical concepts and operations. The predominance of learners in the low-proficiency category suggests that early numeracy remains a major concern in elementary education. Research emphasizes that weak numeracy skills in early grades may hinder learners' future mathematical achievement and academic performance if not addressed immediately (Lopez-Pedersen et al., 2023). Similar findings were reported in studies using the RMA, in which most learners were categorized as low or non-proficient, underscoring the widespread issue of poor numeracy performance among Filipino learners (Tolibas, 2025).

The data further suggest that although many learners have developed a partial understanding of mathematical concepts, a considerable gap remains between emerging skills and expected grade-level competencies. The 33% of learners categorized as "Nearly Proficient" indicate that learners possess

developing abilities but still encounter difficulties in applying mathematical concepts consistently and accurately. This condition may be associated with challenges in number recognition, counting, problem-solving, and basic operations, which are considered essential building blocks of numeracy development.

According to Chang (2023), early numeracy skills strongly predict later mathematics achievement because foundational competencies established in the primary grades serve as the basis for more complex mathematical reasoning in higher levels. Hence, learners who fail to achieve proficiency during the early years may continue to experience academic difficulties in mathematics as they progress through school.

About development, the seven- and eight-year-old learners tested were in Jean Piaget's Concrete Operational Stage, in which they were expected to acquire the ability to perform concrete, logical, mathematical operations (rather than relying on guesswork/intuition). The consistently poor results shown by these learners may indicate that they need further conceptual development before becoming ready to progress towards the expected competencies of the concrete operational stage.

Additionally, the results indicate that while there is a significant difference between learners' current scores and the learning targets for their respective grade levels, learners in the 'Nearly Proficient' category are developing early math skills that can be enhanced through appropriate environmental exposure and learning opportunities. In relation to Bronfenbrenner's Ecological Systems Theory, the results confirm that early numeracy skills are strongly determined by the quality of the learner's immediate home environment and school microsystems. These learners may have limited academic exposure, limited parental involvement, and poor numeracy support at home, which may prevent them from mastering basic math skills. The findings support the contention that low numeracy may be caused not only by cognitive deficits but also by adverse environmental factors, a claim that lacks solid academic support. The finding is in line with previous local findings by Tolibas (2025) on Filipino learners and with global issues in early numeracy by Lopez-Pedersen et al. (2023), which show that low levels of early numeracy have long-lasting effects. Guided by Bronfenbrenner's theory, the study suggests strengthening the child's immediate support environment, which refers to the support of parents to the child, the home learning environment, and school-based interventions to prevent long-term failure in early numeracy.

Problem 4. Is there a significant relationship between the socio-demographic profile and the level of numeracy skills among grade 2 learners, as measured by the Rapid Mathematics Assessment (RMA) tool?

Table 4 presents the Spearman's rho correlation results for the relationship between the socio-demographic profile and numeracy levels. Spearman's rho was used instead of Pearson's r since the data did not meet the assumptions of normality.

Table 4. *Spearman's Rho Correlations Between Socio-Demographic Profile and the Level of Numeracy Skills of the Grade 2 Learners*

Profile Indicators	Spearman Rho	P-value	Remarks
Income	0.074	0.160	Not Significant
Household Size	0.054	0.305	Not Significant
House Ownership	-0.013	0.806	Not Significant
Educational Attainment	0.128	0.015	Significant
Employment Status	-0.059	0.262	Not Significant

Looking closely at the p-values, the table shows that only educational attainment has a p-value less than 0.05. This implies that, among the profile indicators, only parents' educational attainment correlates significantly with learners' numeracy skills. In particular, the rho (r) coefficient of 0.128 indicates that learners whose parents are highly educated exhibit higher numeracy skills than learners whose parents' educational qualifications are lower. On the other hand, other profile variables such as income ($r = 0.074$, $p = 0.160$), household size ($r = 0.054$, $p = 0.305$), house ownership ($r = -0.013$, $p = 0.806$), and employment status ($r = -0.059$, $p = 0.262$) are not statistically correlated with the RMA scores because the p-values are larger than 0.05. These numerical findings further suggest that parents' educational attainment strongly influences learners' mathematical ability.

Similarly, the significant relationship between educational attainment and numeracy skills suggests that parents with higher levels of education are more likely to support and facilitate their children's mathematics learning. Educated parents may possess a better understanding of mathematical concepts, a stronger awareness of educational practices, and greater confidence in assisting children with school-related activities. They are also more likely to provide guidance on learning, monitor academic progress, and create supportive learning environments at home. Pinquart and Ebeling (2020) found that parents' educational attainment significantly predicts children's academic achievement, as educated parents tend to engage more actively in learning-related interactions and educational support. In the context of numeracy, learners whose parents have higher educational attainment are often exposed to richer mathematical experiences and learning opportunities that contribute to stronger foundational skills.

Given a correlation coefficient of only 0.128, it can be concluded that educational attainment is not a stand-alone driver of numeracy skills. Other factors, either affective or cognitive, are certain to explain more of the variation and even causal relations against numeracy skills. In this paper's qualitative findings, parental support, home environment, and anxiety towards mathematics are shown to be highly correlated with learners' numeracy skills. It highlights the idea that children's academic performance depends on the interplay of a wide range of factors. In the context of the findings presented in Table 9, Melhuish et al. (2024) explained that while parental education positively affects children's academic outcomes, school quality and effective instructional practices remain equally important contributors to learners' success. Hence, in the future development of intervention programs, parents' educational attainment must be taken into account. The qualitative findings reveal that parents with lower levels of education lack the capacity to understand grade 2 lessons.

Yigiter (2025) highlighted that socioeconomic factors may affect academic performance indirectly through learning opportunities and parental involvement rather than through economic status alone. In effect, it can be construed that the quality of support and engagement provided to learners may be more important than material conditions.

The absence of a significant relationship between employment status and numeracy skills also suggests that whether parents are employed or unemployed does not necessarily determine learners' mathematical achievement. This finding may be interpreted in different ways. Employed parents may have financial resources but limited time to supervise their children's learning, while unemployed parents may have more opportunities to assist children academically despite limited income. Consequently, parental availability, involvement, and commitment to children's education may be more influential than employment status itself. Caparroso (2024) noted that parental involvement practices such as monitoring homework, communicating with teachers, and engaging children in learning activities have stronger effects on academic achievement than occupational status alone. Therefore, fostering meaningful parent-child learning interactions remains essential in improving numeracy performance.

Further to this, Table 9 underscores the essential role of parental educational attainment in supporting learners' numeracy development while showing that other socioeconomic variables do not significantly influence mathematical performance. The findings imply that schools should strengthen partnerships with parents by conducting numeracy orientation programs, family engagement activities, and home-based learning support initiatives that equip parents with strategies to assist learners effectively.

Since multiple interconnected factors influence numeracy achievement, schools should also continue implementing learner-centered instructional practices, remediation programs, and collaborative interventions that address diverse learning needs. By fostering cooperation among schools, families, and communities, learners may receive the academic and emotional support necessary to strengthen foundational numeracy skills and improve overall mathematics performance.

Problem 5. Is there a significant relationship between the extent of home environment manifestation, parental involvement, cognitive development, and anxiety towards numbers, and the level of numeracy skills of Grade 2 learners, as measured by the Rapid Mathematics Assessment (RMA) tool?

Because the assumptions of normality were not met, Spearman's rho was used to examine the relationships among home environment, parental involvement, cognitive development, and anxiety regarding the numeracy skills of Grade 2 learners.

Table 5 presents the results of the correlation analysis of the variables using Spearman's rho.

Table 5. *Spearman's rho correlations between the predictors' profile and the level of numeracy skills of the Grade 2 learners*

Predictors	Spearman Rho	P-value	Remarks
Home Environment	0.826	<0.001	Significant
Parental Involvement	0.632	<0.001	Significant
Anxiety Towards Numbers	-0.120	0.020	Significant
Cognitive Development	0.115	0.431	Not Significant

Three of the hypothesized predictors, namely home environment, parental involvement, and anxiety towards numbers, are shown to have significant correlations with numeracy skills, as evidenced by values less than 0.05. On the other hand, only cognitive development, with a p-value of 0.431, shows a non-significant correlation with numeracy skills.

The home environment, in particular, has the largest coefficient, 0.826. It further indicates a positive association with numeracy skills. Similarly, a positive home environment is most likely to contribute to better numeracy skills. Melhuish et al. (2024) noted that the home learning environment is a significant correlate of children's numeracy development due to reinforcement within the home. This finding supplements existing knowledge about the critical role of the home environment in improving learning outcomes at the household level. Moreover, a home environment is conducive to learning when learning resources are available, adequate, and readily accessible to learners. It supports the principle that it really takes a village to raise a child. This underscores that the time allotted for numeracy at school is insufficient. Supplemental learning must also be provided at home.

Focusing on parental involvement, Table 10 shows a positive correlation of 0.632, indicating that the more involved parents are in the learning process, the better learners' expected numeracy skills. This

statistical finding underscores the essential role of parents in the development of learners' mathematical thinking ability. Villasenor (2023) supported this idea by arguing that when parents are highly engaged in school activities, learners tend to feel motivated to excel in academics. At the classroom level, the presence of parents is an integral part of the teaching and learning process, considering the learning span and demands of Grade 2 learners. When parents engage in activities and provide effective reinforcement at home, numeracy skills are expected to develop.

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A different direction of correlation is observed between anxiety towards mathematics and learners' numeracy skills. The negative coefficient of -0.120 empirically indicates that when learners exhibit high anxiety towards mathematics, numeracy skills are more likely to be lower. The effect of anxiety towards numbers on mathematical ability is crucial. This is because anxiety reduces motivation to study and depletes self-efficacy resources for facing the challenge of learning mathematics. This is confirmed by Lopez-Ramirez et al. (2025), who stated that anxiety towards mathematics potentially affects foundational skills such as working memory, number sense, and analytical ability. In effect, learners with high anxiety towards numbers usually struggle in math subjects at the higher educational ladder. Because of the serious implications of anxiety, it is deemed important that schools create a learning environment and support mechanism that reduces anxiety.

On a different point, children's cognitive development is not significantly correlated with numeracy skills, as indicated by the p-value of 0.431. In the context of the study, cognitive development appears to be a weak driver of grade 2 learners' numeracy skills. In contrast, the home environment, parental support, and anxiety towards numbers exert greater influence. In accordance with Vygotsky's sociocultural theory, learning occurs through social interaction and guided support rather than through cognitive maturation alone (Alkhudiry, 2024). In effect, the study offers significant insights that may inform future school improvement planning and development focused on addressing the drivers of numeracy skills.

Problem 6. What is the extent of the drivers of numeracy skills, as perceived by teachers, in terms of teacher competence, instructional materials, curriculum and instruction, and school support?

Table 6. *Extent of the Drivers of Numeracy Skills as Perceived by Teachers*

Items	Mean	Standard Deviation	Extent
Teacher Competence	3.52	0.99	High
Instructional Materials and Resources	3.34	1.08	Average
Curriculum and Instruction	3.67	0.88	High
School Environment and Support Programs	3.08	0.93	Average

Note: Mean scores falling within 1.00-1.79: Very Low, 1.80-2.59: Low, 2.60-3.39: Average, 3.40-4.19: High, 4.20-5.00: Very High

Table 6 presents a summary of drivers of numeracy skills as perceived by teachers, showing that Curriculum and Instruction had the highest mean of 3.67, followed by Teacher Competence with a mean of 3.52. This indicates that teachers generally perceive that instructional design, lesson implementation, and curriculum alignment are the strongest contributors to learners' numeracy development. The prominence of curriculum and instruction suggests that structured teaching guides, learning competencies, and classroom strategies are effectively supporting numeracy outcomes. This aligns with the view that well-designed curricula, when properly implemented, significantly enhance foundational mathematical skills among early learners (Hattie et al., 2024). Similarly, the high rating for teacher competence reflects confidence in teachers' pedagogical knowledge and instructional delivery, reinforcing findings that teacher quality remains a central determinant of numeracy achievement (Pan, 2023).

Conversely, Instructional Materials and Resources (M=3.34, Average) and School Environment and Support Programs (M=3.08, Average) received comparatively lower ratings, with the latter being the lowest. This suggests that while teaching strategies and curriculum are perceived positively, limitations remain in the availability, adequacy, and utilization of learning materials as well as institutional support mechanisms. The average rating for instructional resources suggests that learners may not be fully benefiting from the manipulatives, visual aids, or digital tools essential for numeracy development. More critically, the school environment and support programs are the lowest, highlighting potential gaps in intervention systems, enrichment activities, and school-wide initiatives that reinforce numeracy learning.

Problem 7. Is there a significant relationship between teacher-perceived factors (competence, materials, curriculum, support) and learners' numeracy skills?

Table 7 presents the results of the Spearman's rho correlation analysis of the relationship between teacher-perceived factors (competence, materials, curriculum, support) and learners' numeracy skills. Spearman's rho was used because the data do not satisfy the assumptions of normality.

Table 7. *Spearman's Rho Correlations Between Teacher-Perceived Factors and the Level of Numeracy Skills of the Grade 2 Learners*

Predictors	Spearman Rho	P-value	Remarks
Teacher competence	0.077	0.559	Not Significant
Instructional Materials and Resources	0.082	0.575	Not Significant
Curriculum and Instruction	0.001	0.995	Not Significant
School Environment and Support Programs	0.016	0.913	Not Significant

The table shows that none of the perceived factors or predictors significantly correlate with the numeracy skills of Grade 2 learners, as evidenced by p-values greater than 0.05. Hence, this study highlights that most of the variance in the numeracy skills of Grade 2 learners is explained less by teacher factors and more by parental support and learners' anxiety towards numbers. These findings support teachers' ongoing efforts and are unrelated to learners' numeracy skills in the classroom setting. However, challenges persist, resulting in learners with low proficiency on their RMA results. In effect, the statistical results imply the need to empower parents in building a support system at the household level. The findings that are presented in Table 16 are contrary to common results in the literature. This is potentially linked to the relatively lower variances.

Problem 8. What are teachers' experiences regarding the numeracy skills of grade 2 learners?

Table 8 presents the emergence of relevant themes describing teachers' experiences regarding the numeracy skills of grade 2 learners.

Table 8. *Thematic Analysis Results Showing the Experiences of Teachers Relative to the Numeracy Skills Among Grade 2 Learners*

Theme	Sub-theme	Actual Responses
Inadequate Foundational Numeracy Skills	Weak number sense	"Challenges: Weak Number Sense like: 1. Struggling to count forward and backward. 2. Poor understanding of place value (tens and ones). 3. Difficulty in recognizing numbers and their values. 4. Confusion when comparing numbers greater than or less than."
	Difficulty recognizing numbers	"Learners cannot recognize numbers, which is the basic skill before they proceed to addition and other operations."
	Lack of mastery of basic operations	"Did not master the basic operations from the early years of the learners, and the competencies for grade2 were already too hard for the level of the learners."
	Difficulty in addition and subtraction	"Difficulty with basic operations (addition and subtraction). The learners had not yet been fluent with simple facts or may confuse when to add or subtract."
	Weak understanding of place value	"Learners did not fully understand numbers. They are confused with place values of the numbers and have difficulty estimating quantities."
Challenges in Problem-Solving and Comprehension	Difficulty solving word problems	"Difficulty understanding word problems. The learner struggles to understand what the problem is asking."
	Inability to identify operations	"They cannot decide whether it is add or subtract; poor comprehension affects math performance."
	Weak comprehension skills	"Poor problem-solving and comprehension skills because this requires both reading and thinking skills."
	Difficulty understanding mathematical language	"Pupils often know how to calculate numbers but fail to understand the mathematical language in word problems."
	Language barriers	"Language Barriers: Math language and terminologies can be a challenge."
	Difficulty applying math in real life	"Difficulty in problem-solving skills affects their inability to apply math in real-life situations."
Limited Parental Support and Home	Lack of parental guidance	"Lack of parental guidance affects children's mastery in basic mathematical concepts."

Learning Environment	Lack of follow-up at home	"Lack of parental guidance, follow-up. Challenge is difficulty in developing mathematical skills."
	Limited practice at home	"Difficulty in understanding basic number concepts; limited practice at home."
	Absence of learning materials at home	"Lack of practice at home and in their home, no materials to be used in learning."
	Poverty affecting learning	"Because of poverty. Because of these, learning math is much harder because it affects their body and mind."
Learners' Behavioral and Emotional Difficulties	Fear and anxiety in mathematics	"Pupils are afraid when it comes to math."
	Lack of confidence	"They lack confidence in answering mathematical concepts."
	Short attention span	"Short attention span and difficulty in solving word problems."
	Easily distracted	"They are out of focus and easily distracted by their peers."
	Lack of interest and motivation	"Learner's lack of interest; peers in learning counting skills sometimes feel shy and afraid to answer."

Table 8 presents the thematic analysis of teachers' perspectives on numeracy gaps among Grade 2 learners. Four main themes explain the reasons behind learners' difficulties in acquiring numeracy skills. These include inadequate prior numeracy knowledge and skills, difficulties with comprehension and problem-solving, poor support from the family and the home learning environment, and behavioral and emotional challenges among learners. These four themes suggest that numeracy skills may result not only from limited cognitive abilities but also from instructional, environmental, linguistic, and socio-emotional factors. It seems like the learners have different factors that lead to the existence of numeracy skills, and the themes that are represented show the difficult learning environment that the learners are facing in learning Mathematics; these factors play a crucial role in supporting their academic development and readiness in learning Mathematics and, consequently, their overall well-being. Vito (2025) suggests that foundational numeracy skills are a key learning competency that plays an important role in the learning and development of young learners, serving as a foundation that impacts subsequent learning experiences and a child's capacity to participate in the learning process and future community. Children's weak foundation in basic numerical skills during the primary years may lead to enduring learning difficulties if they do not receive support in a child-centered environment.

The first major theme is learners' lack of foundational numeracy skills. The identified weakness learners have about basic number concepts, including counting, number recognition, place value, and basic operations, can be directly attributed to this theme. Teachers acknowledged that many learners could not count forward and backward effectively, could not recall their ones and tens, and often struggled to determine which number was larger. These comments demonstrate that many learners do not yet possess a sense of number, a concept regarded as one of the foundational blocks of early mathematics education. This is an understanding of the relationships between numbers, the magnitude of numbers, and mathematical operations, key aspects for developing abstract mathematical thought processes. Psyridou et al. (2024) stated

that 'A low number sense ability in early childhood is a strong predictor of poor mathematics achievement in later grade levels, given that it is associated with the learner's difficulty in making the association between the abstract concepts of number and basic operations.

Learners failing to identify numbers and understand basic operations is one of the sub-themes in under-prepared foundational numeracy skills. The observations indicated that some learners failed to identify numbers, hindering them from proceeding to the addition and subtraction stages. Some learners did not know when to add or subtract, and some did not know the basic operations they were expected to have learned in previous grades. These results implied that the gap from the previous year remained a barrier to understanding numeracy concepts among Grade 2 learners. Dictado and Dagdag (2023) stated that knowledge in initial math is cumulative, and difficulty in learning initial skills hinders the learning process. Students lacking the skills to perform basic operations rely on memorization rather than conceptual understanding, which can lead to misinterpretation. Remediation and differentiated instruction should be provided to help learners build on their existing understanding.

Teachers further pointed out learners' lack of understanding of place value and estimation. Place value is a crucial aspect of learning mathematics and of understanding how numbers are constructed and how to perform multi-digit computations. Several learners were observed to be unclear about how the value of the digit in a number depends on its position. This can be interpreted as a lack of concept and not just a lack of computing. It is not new to find learners with little knowledge of place value who experience many difficulties with the operations of addition, subtraction, multiplication, and division in the higher grades (Birgin et al., 2022). Observations by teachers highlight that the conceptualization required learning experiences that were tangible and visual, such as manipulatives, context-specific instructions (e.g., place value charts), and hands-on activities, which may strengthen understanding of abstract mathematical concepts.

The second major theme was comprehension and problem-solving issues. The teachers also identified this. It emerged that the learners had difficulty comprehending word problems because they were often unable to interpret what the question was asking them to do. There were also instances in which the learners could not recognize the appropriate mathematical operation to use to answer the question. These responses strongly suggested that issues related to numeracy were intimately connected to issues relating to language comprehension and problem-solving ability. Word problems, by their nature, require learners to read, comprehend, and analyze information before they can perform mathematical operations. As identified by Mallika and Mohammed (2024), the learners' reading comprehension was significantly important to their mathematics achievement because, to work through a word problem successfully, the mathematical language needs to be properly understood. Hence, learners who perform poorly in reading comprehension are also more likely to struggle with word problems and tasks involving verbal reasoning.

Another concern raised by teachers is learners' poor language awareness and mathematical vocabulary. Teachers stated that learners know how to calculate, but not what the language in a math problem is asking them to do. Words such as "more than", "less than", "difference", "sum", etc., may confuse learners with limited vocabulary or exposure to mathematical discourse. The problem is more prominent for those learners experiencing a language barrier. According to Mutodi and Mosimege (2021), the relationship between learning mathematics and language development is crucial, as learners must be able to understand and interpret symbols, vocabulary, and instructions to execute mathematical tasks. Thus, language-responsive mathematics instruction should be incorporated to help learners not only grasp mathematical concepts but also language. The methods employed by teachers could include contextual tasks, visualizations, and mother-tongue instruction.

Weaknesses in problem-solving abilities are also evident in learners' inability to apply mathematics to real-life contexts. According to the teachers, the learners have difficulty relating mathematical concepts to real-life experiences and are therefore unable to apply their numeracy knowledge in meaningful ways. The ability to apply acquired mathematical knowledge to real-life situations is one indicator of numeracy, as it demonstrates that learners understand concepts rather than just calculations. According to Reyna and Brainerd (2023), numeracy is not only the competence with numbers and calculations but also the capacity to use mathematics in daily life and work contexts. A learner who is unable to relate mathematics to real-life experiences may view it as an abstract and unimportant subject, and may have less motivation to learn it.

The third major theme, limited parental support and the home learning environment, also highlights the importance of the home environment in the development of learners' numeracy skills. Teachers often cite a lack of guidance from their parents, no follow-up at home, and little to no practice outside the school environment. Parents reinforce their child's learning by providing homework support, practicing numeracy concepts daily, offering motivation, and giving praise. With poor or no support at home, it is difficult for learners to acquire and retain learned mathematical knowledge. Villasenor (2025) elaborated that parental involvement positively impacts learners' achievement by building learners' confidence and motivation when their parents are engaged in their learning. Hence, poor numeracy achievement among learners could also be attributed to low parental support.

Teachers have also indicated that some learners do not have any learning materials at home for practice and reinforcement. This reality aligns with learners from low socioeconomic backgrounds with limited resources. A teacher explained how poverty negatively affected learners' bodies and minds, making it difficult for them to learn mathematics. Children from low-income households often face multiple disadvantages, including limited access to educational resources, poor nutrition, and stressful home environments, which can all impact cognitive development and the ability to concentrate. Pinquart and Ebeling (20 20) have found that socioeconomic disadvantage does, in fact, play a role in early academic achievement, such as numeracy learning. This evidence suggests that schools need to enhance their collaboration with parents and communities by providing learners from low-income backgrounds with more learning materials, as well as intervention programs and support.

Learners' behavioral and emotional difficulties are the fourth main theme and explain the emotional obstacles to mathematics learning. The teachers said that most learners fear mathematics and lack the confidence to complete mathematical tasks. Math anxiety is common among young children and may arise when learners repeatedly face negative responses or feel ashamed in class. Anxiety prevents learners from paying full attention to learning and tasks, so they do not have a positive impact on problem-solving. Learners' working memory would be adversely affected, negatively impacting their academic achievement, especially among elementary learners (Lopez-Ramirez et al., 2025). Fear of doing the wrong thing might hold learners back from volunteering to complete a math task.

Teachers also expressed concern that short attention span and distractibility contributed to numeracy difficulties. Learners would seemingly stop focusing, look around the room, and talk to others. This may have made it difficult for the learners to hear instructions or follow activities. It may also have made it difficult for the learners to learn mathematical concepts. Lack of attention poses a problem because numeracy tasks may require sustained attention and the ability to sequence tasks. According to Chen (2024), there is a relationship between attention, working memory, and math achievement in young children. Therefore, it may be necessary for teachers to provide hands-on, stimulating activities that engage learners and hold their attention.

Lastly, some teachers indicated that learners are not interested and have less motivation to learn how to count and other mathematics content. According to the teachers, the learners appear ashamed to answer and reluctant to participate. A lack of motivation can also impact the learners' interest in working on difficult schoolwork. Learners who believe mathematics is hard, frightening, or overwhelming are unlikely to engage with and practice math. The Self-Determination Theory in Ryan and Deci (2024) states that if learners feel confident in their abilities, have a sense of control over the situation, and are supported by those around them, their intrinsic motivation increases. The learners are interested and confident if they can create supportive learning environments, encourage their learners, and recognize small wins.

Correspondingly, the theme analysis results show that numeracy disparities among Grade 2 learners are complex and intertwined with other learning factors. Teachers' responses revealed that a lack of strong foundational knowledge, inability to grasp the concept, lack of support at home, and emotional problems cause a gap in numeracy. These results show that a holistic intervention approach that addresses both academic and non-academic variables influencing mathematics learning is needed. The school should enhance its remediation programs, contextualization, parent involvement, and psychosocial interventions to ensure learners overcome numeracy challenges. Through the collaborative efforts of teachers, parents, and administration, learners can build stronger foundational numeracy skills, enhanced self-efficacy, and a greater readiness to learn mathematics at higher grade levels.

The qualitative findings shown in Table 17 align with the quantitative data in Tables 5 and 6, contributing to a single, holistic, and complementary analysis of numeracy skills in Grade 2 learners by empirically demonstrating the interrelated nature of learners' learning struggles with affective, environmental, and cognitive-linguistic obstacles. In fact, Table 5's high overall mean of 3.82 for "Anxiety in Numbers" - marked by low levels of learner confidence and satisfaction in class, high levels of learner anxiety and frustration, and eagerness to admit that learners are often embarrassed by their poor skills and often find math intimidating - provides empirical statistical evidence17 for statistical evidence. "Learners' behavioral and emotional difficulties." For example, the highest overall average score of Table 5 for the study that specifically shows learners' avoidance of completing math assignments (4.01) corresponds exactly to the qualitative theme "Limited parental support and home learning environment" and thus clearly proves the finding of deficient skills due to poor training and learning outside of school. Also, the average quantitative overall mean score of Table 6 of 3.03 for "Cognitive development" shows that the students possess a basic capacity for mathematics; the average quantitative means are low, for example, low capacity to explain the concept 'why' or the method to solve a mathematical problem (2.65) and poor attention to mathematical tasks (3. "Difficulty in solving problems and understanding" and "Low level of foundational numeracy skills," respectively. The congruence confirms that the learning gap cannot be reduced to an intellectual deficit alone; rather, a child's common mental skills are significantly impaired due to excessive math anxiety, a low attention span during math instruction, language comprehension difficulties, and inadequate home learning skills and reinforcement.

Problem 9. What challenges may hinder parents in promoting early numeracy at home?

The thematic analysis presented in Table 18 provides a critical overview of the systemic and individual challenges that impede parental promotion of early numeracy. The table identifies five major themes: limited parental involvement, lack of materials, socioeconomic constraints, limited parental capacity, and environmental distractions.

Table 9. *Thematic Analysis Results Showing the Challenges that Potentially Hinder Parents in Promoting Early Numeracy at Home*

Major Theme	Sub-theme	Actual Responses
Limited Parental Involvement and Guidance	Lack of parental guidance	"Sa pag guide pd, storyahon ra man pero wala kaayo sa oras kay tua man sa trabaho."
	Lack of follow-up at home	"Usahay mag lisod ko og follow-up sa lessons tungod sa panginabuhi.
	Minimal home supervision	"Dili kaayo ma monitor ang bata tungod sa trabaho. Sagdan nalang."
Lack of Learning Materials at Home	Lack of learning materials	"Lack of learning materials, poor comprehension and retention."
	Limited numeracy materials	"Wala man mga materials diri sa balay. "
Socioeconomic Constraints	Poverty affecting learning	"Kinahanglan man mangita kwarta. Walay oras para sa bata sa pag toon og math.."
	Limited financial capacity for educational support	"Dili pd ta ka palit og mga learning materials or device kay gipit man sa finances."
Parents' Limited Capacity to Support Numeracy	Difficulty assisting with mathematical concepts	"Lisod naman ilang lessons karon. Elementary rapd ako natapos".
	Limited ability to reinforce numeracy skills	"Sa una, kay dili man ing-ana ka kalisod. Gamay ra ako matabang, kung naa man gani"
	Weak reinforcement of foundational skills	"Di jd pd dali mag tudlo kay mismo ako tudlo-anan pd."
Home Environment and Learner Distractions	Short attention span at home	"Sa balay dili man ganahan mag toon. Dali ra makalimot."
	Easily distracted learners	"Dili man ga toon og math tungod sa barkada."
	Lack of learner motivation	"Wala kaayo motivation sa pagtoon sa math. Dili ganahan."
	Fear and anxiety in mathematics	"Dili jd daw siya ganahan og math. Mahadlok man noon."

The first theme, Limited Parental Involvement and Guidance, highlights how labor demands encroach upon educational support. Respondents in Table 18 noted that work responsibilities often leave them with no time for follow-up or supervision, with one parent explicitly stating, "Dili kaayo ma monitor ang bata tungod sa trabaho" (The child cannot be monitored well because of work). This suggests that the struggle to balance economic survival with academic involvement creates a "guidance gap" that can lead to lower numeracy levels.

Regarding the Lack of Learning Materials at Home, the table reveals a physical scarcity of educational tools. Parents reported a complete lack of numeracy materials, which directly affects a child's ability to practice concepts outside the classroom. Modern research indicates that the availability of contextualized instructional

materials is a significant predictor of a child's academic success, making this physical void a critical hurdle for early learners.

Socioeconomic Constraints act as a foundational barrier that exacerbates all other themes. As shown in Table 18, parents feel that the need to "find money" (mangita kwarta) leaves them with "no time for the child to study math." This aligns with recent findings that poverty significantly limits a family's financial capacity to purchase educational devices or materials, effectively sidelining the home as a productive learning environment.

The fourth major theme, Parents' Limited Capacity to Support Numeracy, addresses a critical psychological and educational barrier: the parents' own self-efficacy. Several respondents noted that today's lessons are significantly more difficult than what they experienced, with one parent admitting they only finished elementary school. This "capacity gap" makes it difficult for parents to reinforce foundational skills, as they themselves feel they need instruction.

The lack of parental "mathematical self-efficacy" often leads to avoidance or weak reinforcement of skills. When parents perceive their own ability to assist as limited, a concept highlighted in Table 17 as "difficulty assisting with mathematical concepts", it diminishes their intention to engage in home math activities. This creates a cycle in which the child's numeracy development is limited by the parent's confidence in their own education.

Further to this, the Home Environment and Learner Distractions mentioned in the table (and associated data) suggest that domestic settings often lack the structure of a classroom. Distractions and a "short attention span at home" make it difficult for children to focus on abstract numeracy concepts. Without a dedicated, quiet space for learning, even the most well-intentioned parental guidance can be rendered ineffective.

The integration of these themes suggests that barriers to numeracy are often systemic. For instance, Socioeconomic Constraints lead to longer work hours, which in turn causes Limited Parental Involvement. Similarly, a Lack of Learning Materials is often a direct result of limited financial capacity. These interconnected challenges require a holistic approach from schools to provide parents with simplified, accessible modules and training.

Current literature emphasizes that for early numeracy to flourish, the "Home Learning Environment" (HLE) must be supported by school-led interventions. Since parents in Table 18 reported limited capacity and time, educational institutions must bridge this gap by creating "parent-friendly" instructional materials that do not require a high level of prior mathematical knowledge.

The quantitative correlations in Tables 9 and 10 align clearly with the themes in Table 18 and the base measures in Tables 3 and 4, thereby outlining a devastating socio-economic and structural paradox for early childhood numeracy. Table 9 clearly indicates that traditional socio-economic indicators like family income ($p=0.160$), house ownership ($p=0.806$), and parent employment ($p=0.262$) have no statistically significant influence on a learner's actual RMA score; rather, a parent's highest education achieved has the strongest unique correlation with student mathematical aptitude ($r=0.128$, $p=0.015$), directly supporting the qualitative "capacity gap" observed in Table 18 where parents openly admit their limited schooling has made contemporary lessons overwhelming ("Elementary rapod ako natapos. Lisod naman ilang lessons"). This lack of scholastic self-efficacy perfectly explains the minimum in Table 3, where parents score low on the agreement that their home instruction contributes to the child's education (1.88). Thus, children are not predetermined to mathematical mediocrity simply due to financial limitations or unemployment; instead, parental education levels and the resulting instructional insecurities act as barriers to necessary support structures at home.

Hence, both mixed-methods analyses showed that initial mathematical ability does not affect future mathematical ability (Table 10, p=0.431). However, the home learning environment, which can foster such ability, is greatly constrained by financial difficulties, limited physical learning space, and parental confidence, thus underscoring the need for a home learning environment that the school and an uncomplicated environment facilitate. However, these two variables are alarmingly inconsistent with actual home situations, as outlined in Tables 3 and 4: home support (overall mean=2.17) and parental involvement (overall mean=2.22) are in the very high 'Low' range. Table 18 shows the qualitative nature of this disconnection: socio-economic safety pushes both parents to the point where the lack of time for monitoring ("Need to earn money. You do not want to monitor") prevents parental involvement at home, which explains the data in Table 4. Financial constraints are also reflected in the absence of pleasant learning environments, including personal spaces (Table 3, mean = 2.04) and concrete mathematical manipulations (Table 3, mean = 2.53), which would indicate high achievement at home under the parameters of Table 10. Taken together, the two mixed methods do not show success for future mathematics. (Table 10, p = 0.431). However, the home learning environment that can cultivate such ability is almost completely constrained by financial conditions, a lack of physical learning space, and parental confidence, indicating the need for school-facilitated, simplified home learning.

Problem 10. What school practices promote numeracy among learners?

Table 10 presents the emergence of significant thematic areas describing school practices that promote numeracy among learners. These are the efforts of school administrators and teachers, as encouraged and mandated by the Department of Education.

Table 10. *Thematic Analysis on the School Practices that Promote Numeracy Among Learners*

Themes	Sub-theme	Actual Responses
Remediation and Other Intervention Programs	Structured remediation programs	"ARAL Program which focuses on the learners who are behind in reading and numeracy through structured remediation lessons."
	Math remediation support	"Math remediation program provides extra support to struggling learners through small group or one-on-one learning sessions."
	Learning intervention programs	"LEARN intervention program, which schools moderate improvement in learners' numeracy skills."
	Targeted teaching and learning camps	"Remediation, learning camps and targeted teaching help address learning gaps especially in number sense and operations."
Learning Action Cell (LAC) and Teacher Collaboration	LAC sessions for gap analysis	"Conduct LAC sessions to analyze the mathematical gaps in the learners."
	Data-driven analysis	"LAC Sessions. Focused analysis of student numeracy data to pinpoint specific gaps."
	Improving numeracy instruction	"LAC Sessions. Improving the skills of the learners in numeracy."
	Focus on mathematical concepts.	"LAC Session. Focuses on analyzing the mathematical concepts for the learner."
	Teacher collaboration and lesson mastery	"Learning Action Cell that focuses on teaching how the learners master their lessons."

Classroom-Based Numeracy Strategies	Daily math drills	"My best practice in promoting numeracy inside my classroom is having my pupils practice addition, subtraction, and memorizing the multiplication table."
	Continuous numeracy activities	"Daily numeracy activities and follow-up written works or assignments."
	Guided and step-by-step instruction	"Teacher may provide step-by-step demonstration and guided practice."
	Drill exercises	"Classroom activities such as drills, collaborative work or group activities."
Use of Manipulatives and Visual Aids	Use of mini-whiteboards	"Use of mini-whiteboard drills at the lesson to give more activities to understand the math concepts."
	Manipulatives for conceptual understanding	"Use of manipulatives and visual aids to improve learners' understanding."
	Place value charts and counters	"Using visual aids, place value charts and manipulatives like blocks or counters."
	Interactive math tools	"Daily math drills, use of manipulatives (like blocks and counters), and interactive activities like math games and group problem-solving."
	Concrete learning experiences	"Board games involving counting money. Dice games for addition and subtraction."
Gamified and Interactive Learning Approaches	Gamified learning	"Gamified learning in the classroom is one of the classroom enhancements that I can provide for my learners."
	Educational games	"In my class, we usually have games like card games for number comparison."
	Group and collaborative activities	"Collaborative work or group activities are somehow effective because the pupils actively participate."
	Competition-based learning	"Especially if the group activity is a competition-type activity."
	Peer tutoring	"Peer tutoring, which helps struggling learners to understand basic operations."
School-Wide Numeracy Programs	National Mathematics Program (NMP)	"NMP, which focuses on enhancing foundational numeracy."
	ARAL Program	"The ARAL program. It has proven to be highly effective in improving numeracy skills."
	Early Language, Literacy, and Numeracy (ELLN) Program	"Early language, literacy and numeracy program (ELLN) to promote early numeracy skills."
	Rapid Math Assessment (RMA)	"The only activity conducted is RMA to check learners' math skills."
	Project COUNTS	"Project COUNTS should also result in significant improvement in numeracy skills among Grade 2 learners."

Table 10 presents a thematic analysis of school practices that promote numeracy among learners. The findings revealed several significant school strategies that help improve Grade 2 learners' numeracy skills. These practices are categorized into six main themes: remediation and other intervention programs; Learning Action Cell (LAC) and teacher collaboration; classroom-based numeracy strategies; use of manipulatives and visual aids; gamified and interactive learning strategies; and school-wide numeracy programs. Teachers' responses show that schools are implementing a combination of instruction, collaboration, and intervention-based practices to address learners' numeracy gaps and strengthen basic math skills. These findings support the idea that effective numeracy development requires systematic and multifaceted educational approaches. Vito (2025) argued that foundational numeracy improves significantly when schools implement coordinated instructional interventions, teacher support systems, and learner-centered strategies that address learners' specific needs.

The first major theme, remediation and other intervention programs, emphasizes the importance of structured support systems for struggling learners. Teachers identified programs such as the ARAL Program, learning intervention initiatives, remediation sessions, and targeted teaching camps as effective practices in addressing numeracy difficulties. These interventions focus on learners who are behind in basic math skills, particularly number sense and operations. Structured remediation programs are important because they provide additional learning opportunities beyond regular classroom instruction. Sacco et al. (2022) emphasized that targeted mathematics interventions significantly improve learners' computing skills, conceptual understanding, and confidence when instruction is carefully scaffolded and individualized. Through small-group or one-on-one sessions, teachers can assess learners' weaknesses and provide targeted support to address specific learning deficits.

Teachers also noted that learning camps and intervention programs moderately improved learners' numeracy performance. These findings indicate that extended learning opportunities outside of the traditional classroom setting can strengthen math skills and enhance learner engagement. Intervention programs are particularly valuable for learners who experience persistent difficulties because they allow for repeated practice, guided instruction, and a variety of instructional techniques. According to Kayyali (2025), effective remediation programs provide learners with immediate feedback, structured skill development, and mastery-based activities that reinforce basic skills. Such interventions are important in the primary years because unresolved numeracy difficulties can negatively affect future academic performance. Therefore, schools should continue to strengthen intervention initiatives that target learners with low numeracy skills.

The second major theme, Learning Action Cell (LAC) and teacher collaboration, shows the importance of professional collaboration in improving numeracy teaching. Teachers shared that LAC sessions help learners identify gaps in mathematical understanding, analyze numeracy data, and refine teaching strategies for mathematical concepts. This finding highlights the role of collaborative professional development in enhancing teaching effectiveness. Learning Action Cells provide teachers with opportunities to share best practices, discuss learner struggles, and develop evidence-based solutions to improve classroom instruction. Voelkel (2022) emphasized that collaborative professional learning communities positively influence teaching quality by enabling educators to reflect on teaching practices and learner outcomes collectively. Through regular collaboration, teachers become better able to design responsive instructional strategies that address diverse learner needs.

The emphasis on data-driven evaluation during LAC sessions further reflects schools' efforts to make instructional decisions based on actual learner performance. Teachers mentioned analyzing learner numeracy data to identify specific gaps and focus on mathematical concepts that need improvement. Data-informed instruction allows educators to identify patterns of strengths and weaknesses and tailor interventions

accordingly. Anwar et al. (2024) found that schools that use learner performance data effectively are better able to improve academic outcomes because instructional strategies become more targeted and responsive. In the context of numeracy education, data-driven methods help teachers monitor learner progress, evaluate the effectiveness of interventions, and implement timely remediation programs. Thus, LAC sessions serve not only as professional development mechanisms but also as platforms for collaborative problem solving and instructional planning.

The third major theme, classroom-based numeracy strategies, highlights the importance of everyday teaching practices in strengthening learners' mathematical abilities. Teachers identified daily math practice, continuous counting activities, guided instruction, and drill exercises as effective classroom practices. These activities give learners consistent opportunities to practice basic operations, improve fluency, and reinforce math concepts. Repeated exposure to counting activities improves automaticity and accuracy in solving mathematical tasks. According to Pelayo et al. (2023), regular practice and guided instruction are critical components of effective mathematics learning, as they strengthen procedural fluency and support conceptual understanding. Everyday counting activities also help learners gain confidence and familiarity with numbers and operations.

Teachers also emphasized the use of mini-whiteboards and step-by-step demonstrations to increase student participation and understanding. Mini-whiteboards encourage active engagement because learners can answer math questions immediately and receive immediate feedback from teachers. Guided instruction and demonstrations are particularly helpful for struggling learners because they provide clear explanations and scaffolded learning experiences. Accordingly, Hughes et al. (2022) noted that explicit instruction combined with guided practice improves learner achievement, especially for learners experiencing academic difficulties. These strategies help simplify complex math concepts and allow teachers to monitor learner understanding throughout the lesson. As such, classroom-based numeracy skills remain important for developing learners' mathematical fluency and problem-solving.

The fourth major theme, the use of manipulative and visual aids, emphasizes the value of concrete learning experiences in teaching mathematics. Teachers reported using place value charts, blocks, counters, visual aids, board games, and interactive tools to improve learners' understanding of math concepts. Manipulatives allow learners to visualize and physically interact with abstract concepts, making math more understandable and meaningful. For young learners, concrete representations are important because they bridge the gap between abstract symbols and real-life experiences. Tjandra (2023) found that manipulatives significantly improve mathematics achievement when intentionally integrated into instruction to support conceptual understanding. Visual aids and concrete materials help learners understand the value of area, operations, quantities, and numerical relationships more effectively.

The use of interactive math tools and games also reflects schools' efforts to make math learning engaging and learner-centered. Teachers explained that activities such as counting money through board games, dice games for operations, and group problem-solving exercises help learners actively participate in lessons. These strategies align with constructivist learning theories, which emphasize that learners construct knowledge through active experiences and social interactions. Pelayo et al. (2023) found that interactive math activities improve learners' motivation, collaboration, and conceptual understanding by increasing their emotional and cognitive engagement in the learning process. Through hands-on and experiential activities, learners are more likely to retain math concepts and develop positive attitudes toward numeracy.

The fifth major theme, gamified and interactive learning approaches, highlights the effectiveness of game-based instruction in promoting numeracy skills. Teachers shared that gamified learning, educational

games, collaborative group activities, competition-based activities, and peer tutoring motivate learners to participate actively in math lessons. Gamification increases student engagement by introducing fun, challenge, and rewards into the learning process. Young learners are naturally drawn to playful activities, making game-based strategies highly effective in maintaining attention and motivation. According to Li et al. (2024), gamification improves academic engagement and learning outcomes by enhancing active participation and intrinsic motivation. Competition-based activities and collaborative games also encourage students to develop teamwork, communication, and problem-solving skills while reinforcing numeracy concepts.

Peer tutoring has also been identified as an effective strategy in helping struggling learners understand basic mathematical operations. Through peer-assisted learning, learners receive support from classmates who can explain concepts using familiar language and relevant examples. Peer tutoring promotes cooperative learning and builds learners' confidence because struggling learners may feel more comfortable asking peers questions rather than teachers. Darmawan (2023) showed that peer tutoring positively affects academic achievement and social interaction in elementary schools. In mathematics instruction, peer collaboration allows learners to exchange ideas, practice problem-solving, and reinforce their understanding through discussion. This suggests that cooperative learning strategies can complement teacher-led instruction in improving numeracy performance.

The final major theme, school-wide numeracy programs, demonstrates the role of these initiatives in strengthening foundational mathematics education. Teachers identified programs such as the National Mathematics Program (NMP), ARAL Program, Early Language, Literacy, and Numeracy (ELLN) Program, Rapid Math Assessment (RMA), and Project COUNTS as important school-wide practices that promote numeracy development. These programs provide structured frameworks for assessing learners' skills, implementing interventions, and monitoring progress. School-wide initiatives are important because they ensure consistency in instructional practices and promote shared responsibility for learners' academic success. According to Bryant et al. (2021), systematic numeracy programs significantly improve learners' achievement in mathematics when supported by continuous assessment, teacher training, and learner interventions. The implementation of these programs reflects the schools' commitment to strengthening foundational numeracy and addressing learning disabilities in Grade 2 learners.

The institutional mixed-methods convergence indicates a stark operational paradox: school-based programs can be technically and instructionally robust (teacher competencies, curriculum alignment) yet remain statistically disconnected from learner performance. On a quantitative level, it is clear from Table 15 that teachers view internal resources as effective, leading Curriculum and Instruction (Mean = 3.67, High) and Teacher Competence (Mean = 3.52, High), which is further reinforced by the highest metric in Table 11 showing high teacher confidence in executing differentiated instruction techniques (e.g., Games or grouping (Mean = 4.04)). On a qualitative level, the school system effectively puts this internal competence into practice through structured, data-driven Learning Action Cells (LACs), daily math drills on the board, the use of physical manipulatives, and various remediation-building programs throughout the school, such as ARAL, LEARN, and Project COUNTS (Table 19). Nonetheless, an overwhelming statistical discrepancy in Table 16 shows that no internal factors are statistically significantly related to learners' quantitative numeracy outcomes, with all p-values far exceeding the required .05, including Teacher Competence ($p = .559$) and Curriculum and Instruction ($p = .995$). In short, the school's internal success appears to be a constant baseline, and external factors instead drive deviations in learner outcomes; systemic institutional factors within the resource structure further underscore this discrepancy. While school resources report that they have ample digital visual aids (e.g., TVs or projectors (Table 12, Mean = 4.04)) to present engaging activities (Table 19, Mean =3.48), learners' own material resources are lacking (the lowest metric in Table 12 reports that most learners

have no access to personal math textbooks or modules (Mean =2.92)). Such a material gap would then necessitate that teachers rely on interpersonal strategies for school-wide support of math (Table 14, Mean = 3.24), alongside school supports that focus on the lowest-rated school aspect, namely, a lack of systematic monitoring and assessment (Table 14, Mean = 2.94). Additionally, Table 13 suggests that although the curriculum is developmentally sound (Mean = 3.90), time is a highly limiting constraint (Mean = 3.43). Taken together, when the curriculum constraint is viewed alongside teacher competence, it can be observed that the school is already operating as best it can internally and, to improve future results, must rechannel its resources outward to mitigate learner anxiety and establish in-home learning resource support for mathematics.

Problem 11. Based on the study's findings, what holistic strategies and action plans can be proposed to improve grade 2 learners' numeracy skills continually?

Table 11 presents proposed strategic action plans to address the drivers of numeracy skills by strengthening parent involvement, enhancing support for foundational mathematics, and fostering collaboration among schools, families, and local government units to create a sustainable, supportive learning environment for learners' numeracy development.

Table 11. *Strategic Action Plans for the Enhancement of Numeracy Skills*

Identified Areas for Improvement	Objectives	Actions/Strategies	Means of Verification	Persons Involved	Expected Outcomes
Low parental involvement and home environment-related challenges	1. To strengthen parental involvement in supporting learners' numeracy development. 2. To provide opportunities for numeracy learning within the home environment.3. To ensure the availability of supplementary numeracy learning	1. Strengthen School Parent-Teacher Association (SPTA) programs at the school and classroom levels with numeracy-focused activities.2. Conduct parenting sessions and numeracy orientations for parents.3. Implement community-based numeracy extension programs and home learning	1. Approved SPTA action plans and meeting reports.2. Attendance sheets and documentation of parent orientations and numeracy sessions.3. Activity reports and accomplishment reports of community-based numeracy programs.4. Inventory and distribution records of learning materials.	School Heads, Teachers, Parents, SPTA Officers, Barangay Officials	1. Increased parental involvement in learners' numeracy development. 2. Improved home learning environment for numeracy.3. Improved learner performance in numeracy as reflected in RMA scores.

	materials at home.	activities.4. Provide take-home numeracy kits and supplementary learning materials.			
Low mathematical foundations among learners	1. To strengthen remedial and intervention programs for foundational numeracy skills.2. To provide supplementary learning opportunities and materials for struggling learners.	1. Intensify school-based remedial and intervention classes in numeracy.2. Develop and distribute contextualized supplementary learning materials.3. Collaborate with the Barangay LGU for educational support and numeracy intervention programs.4. Conduct school outreach and community-based numeracy reinforcement activities.	1. Remedial class attendance records and intervention reports.2. Samples and utilization reports of supplementary learning materials.3. Memorandum of Agreement (MOA)/Memorandum of Understanding (MOU) with Barangay LGU.4. Program accomplishment reports and learner progress monitoring results.	School Heads, Teachers, Parents, Barangay LGU Officials	1. Improved foundational numeracy competencies among learners.2. Increased learner engagement in numeracy activities.3. Higher numeracy proficiency as reflected in improved RMA scores.
Lack of parental capacity to assist learners' numeracy skills	1. To capacitate parents in supporting numeracy learning at home.2. To create alternative and informal opportunities for numeracy reinforcement.	1. Conduct parent capability-building sessions on home-based numeracy instruction.2. Organize community-based numeracy-enhancing programs in partnership with the Barangay LGU.3. Develop parent-friendly numeracy guides and instructional	1. Training attendance sheets, certificates, and activity reports.2. MOA/MOU with Barangay LGU for numeracy support programs.3. Copies and utilization reports of parent numeracy guides.4. Documentation of family numeracy activities and	School Heads, Teachers, Parents, Barangay LGU Officials	1. Improved parental competence in supporting learners' numeracy.2. Increased learner reinforcement through home and community-based numeracy activities.3. Improved

		materials.4. Conduct family numeracy activities and learner-parent engagement programs.	participation records.		learner numeracy performance as reflected in RMA scores.

One of the major concerns identified in the table is low parental involvement and challenges related to the home environment. To address this issue, the plan aims to improve parental support for learning numeracy by strengthening the School Parent-Teacher Association (SPTA) at both the school and classroom levels. Strengthening SPTA participation can help parents become more engaged in their children's academic development by encouraging regular communication, collaborative planning, and involvement in numeracy-related activities. When parents actively participate in school initiatives, learners are more likely to receive guidance and encouragement at home, which contributes positively to academic achievement. The conduct of regular SPTA meetings that promote numeracy also ensures that parents are informed about strategies they can use to support their children's mathematical learning.

Another important strategy proposed in the table is the conduct of community-based extension programs focused on enhancing numeracy. These programs aim to provide opportunities for learners to practice numeracy skills within their home and community environments. Community-based interventions are valuable because they extend learning beyond the classroom and encourage parents and community members to become active partners in education. Such programs may include numeracy tutorials, parent orientation seminars, mathematics games, and practical activities that integrate mathematics into daily life experiences. Through these initiatives, learners can develop greater confidence and familiarity with mathematical concepts while parents gain awareness of the importance of continuous learning support at home. The expected outcome of these strategies is sustainable parental involvement and improved numeracy performance as reflected in learners' Rapid Mathematics Assessment (RMA) scores.

The table also highlights low mathematical foundations as a major issue affecting learners' numeracy development. To address this concern, the strategic plan proposes strengthening remedial programs in schools and providing supplemental learning materials focused on foundational skills. Remediation programs are essential because they offer struggling learners additional opportunities to master basic mathematical concepts and operations they may have missed during regular instruction. Supplemental materials such as worksheets, visual aids, manipulatives, and activity sheets can further reinforce learning and allow learners to practice skills independently. The plan also emphasizes collaboration with the LGU-Barangay to create support programs for education, underscoring the importance of shared responsibility in improving numeracy outcomes. Through partnerships between schools and local government units, schools may gain access to additional resources, funding, and the workforce necessary to sustain intervention programs.

Another significant issue addressed in the strategic action plan is the lack of parental capacity to assist learners in developing numeracy skills. Some parents may have a limited educational background, insufficient confidence in mathematics, or a lack of knowledge of effective teaching strategies. To address this, the proposed interventions focus on building parents' capacity through community-based numeracy enhancement programs conducted in coordination with the Barangay LGU. These programs may include workshops, demonstrations, and practical training sessions that teach parents simple, effective ways to

support children's numeracy at home. By equipping parents with the necessary skills and knowledge, schools can empower families to become active contributors to learners' mathematical development. Additionally, the plan seeks to create opportunities for learners to be reinforced through informal learning approaches, emphasizing that mathematics can be learned through everyday experiences and practical, home-based activities.

As implied from the objectives, Table 19 demonstrates a comprehensive and collaborative framework for addressing numeracy issues among learners. The strategic action plans recognize that improving numeracy skills requires coordinated interventions involving schools, families, communities, and local government agencies. The proposed strategies aim not only to strengthen learners' mathematical competencies but also to build supportive home and community environments that promote continuous learning. Through reinforced parental involvement, strengthened remediation programs, the provision of learning materials, and community-based partnerships, schools can create sustainable support systems that effectively address learners' numeracy difficulties. If properly implemented and continuously monitored, these action plans may contribute significantly to higher numeracy proficiency levels and improved RMA performance among Grade 2 learners.

Conclusions

Based on the findings presented, the following conclusions are obtained.

1. Socio-economic challenges are evident in the households or families of learners from the Butuan City division. This has significant implications for parents' capacity to be involved in their children's educational journey at home.
2. Home environment and influences are not facilitative of learning opportunities that children should acquire from home. It is worsened by the lack of parental guidance or involvement due to economic reasons.
3. A positively skewed distribution for the RMA scores, highlighting low proficient grade 2 learners in terms of numeracy. This is highly indicative of drivers affecting the numeracy skills that are of prime interest in this paper.
4. Educational attainment of parents is a strong predictor of the numeracy skills of the learners. This is explained by parents' capacity to understand lessons that enable them to assist their children at home. However, some are challenged by time and physical limitations when exposed to the elements at work.
5. Home environment and parental involvement are significant predictors of learners' numeracy. On the other hand, anxiety about numbers negatively affected numeracy.
6. Teacher factors are not critical issues in schools because of the different efforts and strategies performed to address the drivers of numeracy skills.
7. Correlation analysis concludes the non-significant contribution of the teacher factor to the numeracy skills of the learners.
8. Experiences of the teachers provided in-depth support to the statistical findings about the home and parental challenges that hinder numeracy support in the household context. Moreover, anxiety towards numbers is a critical barrier to learning that will persistently impede progress in numeracy. However, although cognitive development is not statistically supported, teachers still identified areas for improvement in learners' cognitive dimensions.

9. Parents have confirmed the quantitative results with regard to their inability to assist children at home due to economic needs, lack of educational materials, and low educational qualifications.
10. Schools and teachers provided opportunities and interventions to address numeracy but were not considerate of empowering parents and promoting community-based numeracy-enhancing extension programs.
11. The study implies the need for strategic action plans or interventions that consider parental involvement and promotion of home environmental influences through optimal partnership with Barangay LGU and other relevant and interested stakeholders.

Recommendations

Considering the findings and conclusions presented above, the following recommendations were drawn.

DepEd Management. They may be used by DepEd management as evidence-based inputs for creating action plans and strategies to address numeracy problems in the school setting. Moreover, the study's findings may serve as a benchmark for an action plan for top management's consideration in the annual school improvement plan.

School Leaders. School heads may use them as direct inputs to school planning and budgeting. Focusing on collaborations and community extension, the proposed action plan might be considered for institutionalization at the school level. This approach will result in tailor-fit initiatives that empower, build capacity, and engage parents in the educational journey and success of their children.

Teachers. Teachers might consider this when developing appropriate interventions that span learners' cognitive and affective dimensions. For instance, the high anxiety towards numbers provides significant insight into the search for effective pedagogical approaches and classroom management strategies in general.

Barangay LGU. They can help with the enactment and promotion of good governance in education. The study's output can offer opportunities for Barangays to maximize their educational programs and address enrollment gaps in collaboration with schools.

Future Researchers. They may provide options for another investigation. Expanding the geographical scope will provide more evidence capturing the variability in practices and beliefs about learners' numeracy skills. On the quantitative side, fitting a structural model will yield a deeper understanding of the drivers of numeracy skills and thereby inform a more effective intervention.

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