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Reading comprehension and Mathematics problem-solving performance among Grade 5 pupils at Marigondon Elementary School: Basis for an intervention plan

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ABSTRACT

A struggling reader is often a struggling problem solver.This study aimed to determine the relationship between reading comprehension and mathematics problem-solving performance among Grade 5 pupils at Marigondon Elementary School during the academic year 2025–2026 as a basis for an intervention plan. It employed a descriptive-correlational research design with a purposive sampling method to select 300 Grade 5 pupil-respondents. Data were gathered through a researcher-made questionnaire for the respondents' profile and through the official quarterly assessment records in English and Mathematics. Data were analyzed using descriptive and inferential statistics at the 0.05 level of significance. The findings revealed that the majority of the pupils were ten years old and that male and female respondents were equally distributed. The pupils' performance in both reading comprehension and mathematics problem-solving was consistently low across all four quarters, with most falling under the "Did Not Meet Expectations" category. A moderately strong positive correlation was found between reading comprehension and mathematics problem-solving, indicating a significant relationship between the two variables. However, no significant difference was found in the pupils' performance in both areas when grouped according to sex. The study concluded that the reported correlation demonstrates that pupils with higher reading comprehension scores tended to obtain higher mathematics problem solving scores. Based on these findings, an intervention plan was proposed to strengthen pupils' foundational reading skills and integrate reading comprehension strategies into mathematics instruction.

Keywords: Administration and Supervision,Reading Comprehension, Mathematics problem-solving, Descriptive-Correlational, Intervention Plan

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INTRODUCTION

Reading comprehension serves as the cognitive foundation for word problem-solving, as students must accurately decipher linguistic cues, syntax, and specialized vocabulary to construct precise mental representations of problem scenarios (Nordbø & Amland, 2026).

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This process requires students to synthesize technical mathematical terminology with narrative context, enabling them to identify the necessary operations hidden within complex problem conditions (Hagge &Appova, 2025).

Consequently, rigorous vocabulary knowledge and the ability to draw logical inferences are essential for decomposing multi-step problems, as these skills facilitate the transition from literal reading to the construction of a comprehensive situation model (Opitz, 2021). Specifically, the capacity to integrate local linguistic input with prior mathematical knowledge allows pupils to transform abstract word-problem text into structured mental propositions (Zhang, et al., 2023). These mental representations are critical for navigating multistep sequences, as students must systematically evaluate relational cues and missing information to determine the correct numerical operations (Δημητρίου et al., 2022).

In contemporary elementary education, literacy and numeracy are increasingly recognized as intertwined pillars of academic success, where foundational proficiency in one domain serves as a prerequisite for navigating the complexities of the other (Waiswa et al., 2024). By fostering a pedagogical approach that integrates reading, writing, and mathematical reasoning, educators can better equip students to address the multifaceted challenges inherent in modern academic environments. This cross-curricular synthesis is particularly essential for elementary learners, as the ability to interpret textual information is a prerequisite for executing mathematical problem-solving tasks (Pratiwi, et al., 2025), (Tanjung, 2024).

Furthermore, research underscores that students lacking these integrated competencies often struggle to achieve expected proficiency levels, as reading comprehension directly dictates the efficacy of interpreting and solving mathematical problem statements (Dangao, 2025; Lusaran, et al., 2026). Consequently, educational frameworks that prioritize the alignment of literacy and numeracy instruction are vital for enhancing student engagement and mastery of core competencies (Sari, 2025).

On a global scale, persistent disparities in literacy and numeracy remain central barriers to educational quality, necessitating evidence-based interventions to improve foundational learning outcomes (Pulido et al., 2026). International frameworks increasingly emphasize the synergy between language acquisition and quantitative reasoning as essential indicators of student readiness and long-term academic attainment (Tugade, 2026). Because reading comprehension influences how effectively learners identify key variables and apply appropriate operations, the development of these interconnected skills is crucial for meeting global educational standards (Espeña & Estera, 2026; Mendigorin, 2026). Indeed, scholarly evaluations consistently identify the instructional integration of literacy and numeracy as a strategic mechanism for elevating student performance in mathematical problem-solving (Ersando et al., 2025; Velasco & Curayag, 2025). This holistic approach not only bolsters individual critical thinking and analytical capabilities but also ensures that students possess the foundational proficiency required for global competitiveness in an increasingly complex academic landscape (Sharma, 2025; Siregar et al., 2025). The World Economic Forum highlights these capacities as vital components of the National Literacy Movement, underscoring that the ability to process and apply information efficiently is necessary for navigating modern societal demands (Suryaningsih et al., 2025).

Consequently, viewing mathematics reading the ability to interpret symbols and textual representations as a critical component of numeracy literacy allows for more targeted instructional strategies (Rahmawati et al., 2026). Research suggests that early literacy development and cognitive processing are intrinsically linked to numerical proficiency, establishing a shared foundation that facilitates the mastery of complex mathematical concepts (Chang, 2023; Fauzan et al., 2024).

Furthermore, the capacity to apply mathematical reasoning in diverse contexts reflects the modern emphasis on preparing learners for 21st-century requirements, where reading

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skills directly support the comprehension of data-driven material (Andanan, 2026; Zakaria et al., 2023). This alignment is especially critical when addressing arithmetic word problems, which demand linguistic competence to translate narrative scenarios into actionable mathematical strategies (Lindström-Sandahl, 2023).

Despite ongoing educational reforms, national assessments have revealed a persistent crisis in foundational learning, with international studies such as PISA 2018 and 2022 highlighting a significant five- to six-year lag in literacy and numeracy competencies among Filipino students (Bacus et al., 2025).

These systemic deficiencies are further compounded by reports of underperformance in tasks requiring arithmetic reasoning and flexible strategy use, indicating a critical gap between current classroom instruction and required conceptual mastery (Bercasio et al., 2025). Indeed, current national performance data reflects an alarming reality where the vast majority of learners struggle to independently interpret or represent basic everyday mathematical situations (Descatamiento & Escalante, 2026; Santos et al., 2022). Such challenges are particularly pronounced in the transition to more advanced curricula, as students demonstrate moderate levels of difficulty in both reading fluency and the application of basic mathematical operations (Navarro & Bolongaita, 2026). Empirical data from local contexts further corroborate this trend, frequently identifying substantial proportions of learners who fail to reach basic proficiency thresholds in foundational literacy and numeracy assessments (Jabanes & Futalan, 2025a, 2025b). These trends underscore the urgent necessity for targeted, multi-dimensional interventions that integrate literacy and numeracy strategies to bridge existing learning gaps (Tugade, 2026a, 2026b). School-based programs frequently encounter significant obstacles in implementation, yet these localized efforts remain essential as scholars continue to explore how reading comprehension directly influences the mastery of numeracy skills (Libo-On, 2025), (Miñoza et al., 2025). In the Philippines, many students who complete primary education remain categorized as slow or non-readers, a persistent deficit that limits their ability to comprehend and solve mathematical problems (Divinagracia, 2023).

Moreover, data from the Second Congressional Commission on Education indicates that millions of Filipinos are functionally illiterate, a statistic that directly correlates with the nation's suboptimal performance in standardized mathematical evaluations (Jr., 2026). This systemic inability to master foundational competencies serves as a significant obstacle to national development, as poor reading habits and low achievement levels continue to undermine the country's competitive standing in the global economy (Tomas et al., 2021). Addressing these foundational deficits requires a synchronized approach, as research indicates that literacy and numeracy achievement levels remain unevenly distributed and necessitate contextualized, evidence-based instructional strategies (Asvika et al., 2025; Banawi et al., 2022). These persistent challenges underscore the need for rigorous, evidence-based programs that explicitly target the developmental nexus between linguistic comprehension and quantitative reasoning (Nadda, 2025), (Lusaran et al., 2026).

Integrating digital platforms, such as interactive e-modules and educational videos, provides students with dynamic learning environments that bridge textual analysis with mathematical discourse (Lestiawati & Rostini, 2026). Furthermore, the application of augmented reality and gamified platforms facilitates a more immersive experience, allowing learners to visualize abstract concepts through interactive narratives that reinforce both linguistic and quantitative reasoning (Ismail et al., 2025; Rincón et al., 2026). By leveraging these digital tools, educators can scaffold learning through personalized, multiliteracy-

focused tasks that align with students' individual zones of proximal development (Darmanova et al., 2025; Firdaus et al., 2024).

Platforms like DepEd Commons and Khan Academy offer curated repositories of interactive materials that enable learners to practice vocabulary acquisition and inference-making through scaffolded digital reading exercises (Polydoros, 2026). These tools facilitate consistent practice in contextually enhanced reading, which research demonstrates leads to greater gains in mathematical word problem performance compared to standard instructional approaches.

Moreover, these digital environments allow for explicit vocabulary instruction, ensuring that students effectively manage the linguistic complexities inherent in mathematical discourse (Tran & Schepers, 2023). While these platforms provide essential scaffolds, it remains critical to balance technological engagement with rigorous pedagogical oversight to ensure that students do not struggle with conceptual depth (Huda et al., 2025). Effective implementation requires that faculty design learning management system activities to provide ongoing pedagogical guidance, ensuring that digital engagement is consistently paired with purposeful, content-specific mathematical practice (Acopio, 2025).

Computer-based simulation tools provide dynamic environments where pupils can manipulate virtual objects to visualize the stages of multistep mathematical problems, effectively transforming abstract constraints into concrete operations (Cotič et al., 2024; Engelbrecht & Borba, 2023). By utilizing simulations to experiment with variables and observe immediate relational feedback, students develop stronger intuition regarding complex operations and the logical sequence required for problem resolution (Žakelj & Klančar, 2022). This immersive approach helps students bridge the gap between static textual descriptions and the dynamic requirements of multistep tasks, significantly improving their conceptual understanding (Nugroho et al., 2024). Furthermore, these simulation-based environments serve as vital mediating artifacts that promote cognitive flexibility, allowing students to convert narrative constraints into interactive, visual representations of mathematical processes (Ovodenko & Kouropatov, 2025).

Marigondon Elementary School serves as a critical site for this study, as the transition to Grade 5 represents a pivotal stage where students must shift from basic decoding to complex conceptual application in mathematical problem-solving. Preliminary reviews of quarterly assessments and teacher anecdotal records at Marigondon Elementary School reveal a persistent disparity between pupils' computational fluency and their ability to successfully parse narrative-heavy word problems.

During the 2025–2026 school year, this demographic becomes particularly vital to monitor as educators seek to address post-pandemic learning gaps that have widened the disparity in foundational skill mastery (Baliling, 2025). Furthermore, this academic year serves as a benchmark for evaluating the long-term impact of curriculum adjustments implemented to recover lost competencies, providing an essential window to observe whether current pedagogical interventions sufficiently support the cognitive demands of the fifth-grade syllabus (Hazin et al., 2025).

Specifically, analyzing this cohort allows for the identification of persistent linguistic barriers that impede learners from translating narrative word problems into accurate mathematical models (Baribar & Escote, 2026). By identifying the specific nexus between textual interpretation and quantitative calculation, this research aims to establish evidence-based baseline data to refine instructional delivery for pupils at this crucial juncture (Laia et al., 2025). By documenting these developmental milestones, the findings will provide a strategic roadmap for designing localized interventions that foster both linguistic confidence and numerical accuracy (Sitanggang & Noviyanti, 2026).

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Ultimately, this investigation seeks to bridge the gap between literacy and numeracy performance, ensuring that pupils possess the critical comprehension skills necessary to navigate increasingly complex academic tasks (R. et al., 2026; Setiadi, 2025). This comprehensive approach not only addresses immediate pedagogical needs but also contributes to the broader academic discourse on developing effective, integrated strategies for upper elementary instruction (Suryadi et al., 2024). This integrated focus aligns with broader research indicating that structured intervention programs are essential for successfully navigating the cognitive transitions required by the upper elementary curriculum (Legisma, 2023; Morales et al., 2026).

Statement of the Problem

This study aimed to determine the relationship between reading comprehension and mathematics problem-solving performance among Grade 5 pupils at Marigondon Elementary School during the school year 2025-2026 as basis for an intervention plan.

Specifically, this study sought to answer the following questions:

1. What is the profile of the pupil-respondents in terms of age and gender?
2. What is the level of performance of pupils in reading comprehension based on quarterly assessments?
3. What is the level of performance of pupils in mathematics problem-solving based on quarterly assessments?
4. Is there a significant relationship between pupils' reading comprehension and their mathematics problem-solving skills?
5. Is there a significant difference between pupils' if group according to gender:
   5.1 reading comprehension; and
   5.2 mathematics problem-solving skills?
6. Based on the findings, what intervention plan can be proposed?

METHODOLOGY

Research Design

This study utilized a descriptive-correlational research design to describe the profile of Grade 5 pupils in terms of age and gender and assess their reading comprehension and mathematics problem-solving performance. It also examined the relationship between reading comprehension and mathematics problem-solving skills, as well as differences in performance when grouped by gender. This design was appropriate because it enabled the collection and analysis of quantitative data to determine existing conditions and relationships among variables without manipulation.

Respondents and Locale of the Study

This study was conducted at Marigondon Elementary School, Lapu-Lapu City, Cebu, and involved 300 Grade 5 pupils enrolled during School Year 2025–2026. Using purposive sampling, respondents were selected from seven sections: Manilag (50), Ngujo (48), Amores (48), Jumaos (47), Belga (47), Canada (44), and Almodal (16). Grade 5 pupils were chosen because they are at a critical stage in developing reading comprehension and mathematics

problem-solving skills, making them appropriate participants for examining the relationship between these variables and providing reliable data for the study.

Research Instrument

The study utilized the Grade 5 pupils' Reading Comprehension Scores and Mathematics Problem-Solving Scores obtained from their quarterly assessment results, along with a researcher-made questionnaire to gather demographic information such as age and gender. The assessment tools were standardized and validated by subject teachers and the school's academic committee, ensuring alignment with the K to 12 Curriculum and DepEd assessment guidelines. A pilot test conducted among 30 non-participating Grade 5 pupils yielded Cronbach's Alpha coefficients of 0.85 for Reading Comprehension and 0.87 for Mathematics Problem-Solving, indicating good reliability and confirming the suitability of the instruments for the study.

Data Analyses Procedure

The study followed three phases: preliminary, data gathering, and post-data gathering. During the preliminary phase, necessary permissions were secured, informed consent was obtained, and the research instruments were validated and pilot-tested. In the data gathering phase, the researcher administered the questionnaire and collected the respondents' quarterly assessment records in Reading Comprehension and Mathematics. In the final phase, the data were organized, encoded, tabulated, and analyzed using appropriate statistical tools to determine the respondents' profile, performance levels, relationships, and differences among the study variables, which served as the basis for the study's findings, conclusions, recommendations, and proposed intervention plan.

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

Data reveal that the majority of the 300 Grade 5 pupil-respondents were within the expected age range for their grade level, with 10-year-olds (52.00%) and 11-year-olds (34.00%) accounting for 86.00% of the sample. This indicates that most pupils progressed through the elementary curriculum at the normal pace, while a small proportion of over-age and under-age learners may have experienced delayed enrollment, grade repetition, or other educational interruptions. The findings suggest that age and developmental maturity may influence pupils' reading comprehension and mathematics problem-solving performance, as variations in cognitive and language development can affect academic achievement. These results underscore the need for differentiated and age-appropriate instructional strategies to address learners' diverse needs and support improved performance. This interpretation is supported by the findings of Fuchs et al. (2021), who emphasized the role of language comprehension in mathematical problem-solving, and Vestheim et al. (2025), who reported that age-related developmental differences significantly affect reading and mathematics achievement among elementary learners.

In terms of gender, of the 300 Grade 5 pupil-respondents 150 males (50.00%) and 150 females (50.00%), providing balanced representation and ensuring fair and unbiased comparisons of reading comprehension and mathematics problem-solving performance. This

equal distribution enhanced the credibility and generalizability of the study's findings and allowed for a valid examination of gender-based differences in academic performance. The results underscore the importance of considering gender as a variable in assessing learning outcomes and developing inclusive, gender-responsive instructional strategies and interventions. This interpretation is supported by Ehm et al. (2024), who found persistent gender differences in reading and mathematics achievement, and Wang et al. (2024), who reported that gender-specific patterns exist in mathematics problem-solving and that reading comprehension significantly predicts success in mathematical word problems, particularly among girls.

Reading Comprehension

Grade 5 pupils generally demonstrated low reading comprehension performance across all four quarters, with the majority consistently classified under "Did Not Meet Expectations." Although there was a gradual improvement toward the fourth quarter, as reflected in the decrease in pupils under this category and the increase in the mean score from 20 in the second quarter to 26 in the fourth quarter, the overall performance remained below the satisfactory level. The findings indicate that many pupils experienced difficulties in understanding and interpreting written texts, which may have hindered their achievement in other academic areas, particularly mathematics problem-solving. These results highlight the need for intensified reading interventions, explicit comprehension strategy instruction, and continuous teacher support to strengthen learners' reading skills and overall academic performance. This interpretation is supported by Al Otaiba et al. (2023), who emphasized the effectiveness of systematic and intensive reading interventions in improving comprehension outcomes, and Jala (2020), who found a significant positive relationship between reading comprehension and mathematics problem-solving performance among elementary learners.

Level of Performance of Pupils in Mathematics Problem-Solving Based on Quarterly Assessments

Results of this study reveal that the Grade 5 pupils demonstrated very low mathematics problem-solving performance across all four quarters, with the majority consistently classified under "Did Not Meet Expectations." Although slight improvements were observed in the third and fourth quarters, as reflected in the increase of the mean scores from 16 in the second quarter to 22 in the third and fourth quarters, the overall performance remained below the expected proficiency level. The findings indicate that many pupils experienced significant difficulties in solving mathematical word problems and computational tasks, highlighting the need for intensive and targeted interventions, including remedial mathematics programs, regular problem-solving activities, and explicit instruction in mathematical strategies. Moreover, the results suggest that weaknesses in reading comprehension may have contributed to the pupils' poor mathematics performance, underscoring the importance of integrating literacy and numeracy interventions. This interpretation is supported by Vessonen et al. (2024), who found that linguistic demands significantly affect mathematical word-problem performance, Powell et al. (2021), who demonstrated the effectiveness of schema-based problem-solving instruction, and Fuchs et al. (2026), who reported positive outcomes from interventions that simultaneously address mathematics and reading difficulties.

Relationship Between Pupils' Reading Comprehension and their Mathematics Problem-Solving Skills

Data show a significant moderate to strong positive relationship between reading comprehension and mathematics problem-solving skills among the Grade 5 pupils, as evidenced by the Pearson correlation coefficient ($r = 0.63$) and a p-value of 0.00, leading to the rejection of the null hypothesis. This indicates that pupils with higher reading comprehension scores also tended to achieve better mathematics problem-solving performance, highlighting the crucial role of literacy skills in understanding and solving mathematical word problems. The findings suggest that strengthening reading comprehension may contribute to improved mathematics achievement and support the implementation of integrated literacy-numeracy interventions. This interpretation is consistent with the studies of Nikmah (2025), who found a significant positive correlation between reading comprehension and fraction word-problem solving ($r = 0.596$), Pratiwi et al. (2025), who reported a strong relationship between reading literacy and mathematical problem-solving ($r = 0.896$), and Dagdag and Dagdag (2026), who found that reading fluency and comprehension significantly predicted mathematics performance among Filipino learners.

Difference Between Pupils' Reading Comprehension if Group According to Gender

Although male pupils obtained a slightly higher mean reading comprehension score ($M = 23.22$, $SD = 5.90$) than female pupils ($M = 22.56$, $SD = 4.75$), the p-value of 0.28 was greater than the 0.05 level of significance, leading to the failure to reject the null hypothesis. This indicates that there was no significant difference in the reading comprehension performance of Grade 5 pupils when grouped according to gender, suggesting that both male and female learners demonstrated comparable reading abilities and experienced similar levels of difficulty in comprehension. The findings imply that reading interventions should be implemented equitably for all learners, regardless of sex, and should focus on addressing common reading challenges rather than gender-based differences. This interpretation is supported by Almonte and Perez (2025), who found no significant relationship between gender and reading comprehension ($t = 0.37$, $p = 0.713$), and Temporal (2025), who likewise reported no statistically significant difference in reading comprehension based on gender ($H(1) = 3.52$, $p = 0.061$).

Difference Between Pupils' Mathematics Problem-Solving Skills if Group According to Gender

The female pupils obtained a slightly higher mean score ($M = 20.24$, $SD = 4.53$) than male pupils ($M = 19.72$, $SD = 5.94$) in mathematics problem-solving; however, the p-value of 0.39 was greater than the 0.05 level of significance, leading to the failure to reject the null hypothesis. This indicates that there was no significant difference in mathematics problem-solving performance between male and female Grade 5 pupils, suggesting that both groups demonstrated comparable abilities and encountered similar challenges in solving mathematical word problems and computational tasks. The findings imply that mathematics interventions should be implemented equitably for all learners regardless of gender and should focus on addressing common learning difficulties rather than gender-based differences. Moreover, the integration of reading comprehension strategies into mathematics instruction may help improve problem-solving performance for both groups. This interpretation is supported by Caviola et al. (2026), whose meta-analysis found only minimal gender

differences in elementary mathematics performance, particularly in word problems, and Latipah et al. (2026), who reported no significant gender-based differences in mathematical problem-solving among fifth-grade learners.

CONCLUSION

Based on the findings of the study, it was concluded that there was a significant relationship between reading comprehension and mathematics problem-solving performance among Grade 5 pupils at Marigondon Elementary School. The moderate to strong positive correlation confirmed that reading comprehension played a crucial role in the pupils' ability to understand and solve mathematical word problems. Pupils who demonstrated better reading comprehension skills also tended to perform better in mathematics problem-solving, while those with poor reading comprehension skills also tended to struggle in solving mathematical problems. However, the study also revealed that the pupils' performance in both reading comprehension and mathematics problem-solving was consistently low throughout the academic year, with the majority of the pupils falling under the "Did Not Meet Expectations" category. Furthermore, the study found that sex was not a significant factor in the pupils' performance in either reading comprehension or mathematics problem-solving, as male and female pupils demonstrated comparable levels of performance in both areas. These conclusions underscored the urgent need for an integrated and holistic intervention plan that addressed both reading comprehension and mathematics problem-solving skills, as improving one skill could produce positive effects on the other.

RECOMMENDATIONS

Based on the findings and conclusions of the study, it is recommended that the Intervention Plan be implemented to improve the reading comprehension and mathematics problem-solving performance of Grade 5 pupils at Marigondon Elementary School. The intervention plan should focus on strengthening the pupils' foundational reading skills, as reading comprehension was found to be significantly related to mathematics problem-solving. It should include intensive remedial reading programs, daily reading activities, and explicit instruction in comprehension strategies such as predicting, questioning, clarifying, and summarizing. The intervention plan should also integrate reading comprehension strategies into mathematics instruction, particularly in the context of solving word problems, through vocabulary-building activities in mathematics, guided practice in analyzing and solving word problems, and explicit instruction in problem-solving strategies such as understanding the problem, devising a plan, carrying out the plan, and looking back. Furthermore, the intervention plan should be inclusive and responsive to the needs of all learners, regardless of gender, since no significant difference was found between male and female pupils.

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