



Research in Management and Humanities

DWIJMH VOL. 5 NO. 2 (2026) ISSN: 2980-4817

Available online at www.dwijmh.org

Journal homepage: <http://www.dwijmh.org>

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Linking reading comprehension and math problem solving: Teachers' views and instructional strategies

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ARTICLE INFO

Article history:

Received: March 15, 2026

Received in rev. form. April 20, 2026

Accepted: May 15, 2026

Published: June 10, 2026

Keywords: *Bridging, literacy, reading comprehension, math word problem, teacher perceptions.*

ABSTRACT

This study aimed to determine Grade 6 teachers' views and instructional strategies regarding the relationship between reading comprehension and Grade 6 pupils' mathematical word-problem-solving abilities in the Bucay District. This study employed a descriptive-correlational research design to examine the association between reading comprehension and mathematical word-problem solving. Descriptive statistics, mainly the weighted mean to summarize teachers' perceptions, and Pearson's moment-correlation coefficient, were used to determine the relationship between reading comprehension and mathematical word problem solving. The study population included all 50 Grade 6 teachers currently teaching in public elementary schools within the Bucay District. The findings revealed that: teachers had always a consistent view in improving the reading comprehension skills of their pupils by explicitly teaching them how to break down word problem and help them extract relevant data from math word problem; teachers view on the pupils' ability to solve mathematical word problem is very high, emphasize that bridging reading and math improves critical thinking and assert that pupils should be assessed in both reading and math word problems.

JEL Classification: I21

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Introduction

Globally, educators and curriculum developers have emphasized the importance of integrative learning to promote higher-order thinking skills. According to Vacca et al. (2020), students often struggle with mathematics not because they lack numerical skills but because they have difficulty understanding the language of the problem. Word problems, which combine reading and mathematics, pose a unique challenge for learners with low reading proficiency. Hence, enhancing reading comprehension can positively influence mathematical performance. In the Philippine context, the Department of Education has initiated several national programs to address early reading and numeracy gaps, including Every

Child a Reader Program (ECARP) and Hamon: Bawat Bata Bumabasa (3Bs Initiative) (DepEd, 2019). These efforts highlight the government's recognition of the urgent need to develop both literacy and numeracy skills, especially at the elementary level. Yet, despite these initiatives, learning outcomes in both domains remain below expected standards, particularly in rural and underserved regions.

The Schools Division of Abra, located in the Cordillera Administrative Region, comprises various districts with distinct socio-cultural and economic backgrounds. One such district is Bucay, a fifth-class municipality where learners face challenges such as limited access to instructional materials, a lack of print-rich environments, and economic hardships. Teachers in the Bucay District observe that many Grade 6 pupils find it difficult to solve mathematical word problems, and they attribute this difficulty in part to poor reading comprehension. These classroom realities highlight the need to explore teachers' perceptions of the link between reading and math performance.

Teachers, as the implementers of the curriculum and facilitators of instruction, are well-positioned to provide insights into how learners process information across subject areas. Their observations can serve as a credible basis for assessing instructional gaps and devising strategies to improve student performance. By examining teachers' views on the relationship between reading comprehension and mathematical word-problem solving, this study aims to address a research gap and provide context-specific recommendations for instructional planning in the Bucay District.

This quantitative study therefore investigates how Grade 6 teachers in the Bucay District perceive the influence of reading comprehension on learners' ability to solve mathematical word problems. Through a structured survey approach, the research intends to gather empirical data on classroom observations, instructional challenges, and teacher-identified learner difficulties. Ultimately, the study's contribution is to the ongoing discourse on bridging literacy and numeracy in Philippine elementary education. These observed scenarios in pupils' reading and mathematical problems prompted the researcher to explore how to address them and help pupils deepen their understanding of the subjects through a proposed guided instructional approach.

This study is organized into several sections: introduction, literature review, research methodology, data presentation and analysis, results and discussion, and conclusion.

Literature review

This literature review examines existing research on the relationship between reading comprehension and math problem solving, including teachers' views and instructional strategies.

Reading comprehension

Reading comprehension plays a critical role in a child's ability to access and process information, not only in language subjects but across the curriculum. According to Alqahtani (2020), vocabulary and comprehension are interrelated and necessary for learners to fully grasp the meaning of texts. In mathematics, where language is used to contextualize problems, learners with limited comprehension skills often misinterpret word problems, resulting in incorrect solutions.

Research has shown that poor reading comprehension significantly affects pupils' performance in solving word problems in mathematics. Vilenius-Tuohimaa et al. (2020) found that reading comprehension was a strong predictor of success in mathematical problem solving, particularly among elementary school pupils. This implies that the ability to understand the problem text influences the accuracy of the mathematical process and outcome.

Word problems require not only mathematical computation but also interpretation of linguistic structures. According to Abedi and Lord (2001), the complexity of language used in standardized test items can pose significant barriers to students, especially those with lower reading proficiency. When students are unable to decode the problem text, their ability to perform correct computations is compromised.

In the Philippine context, PISA 2018 results showed that Filipino learners struggle with both reading and mathematical literacy. The Department of Education (2020) acknowledged that learners' inability to comprehend written material is a primary cause of their poor numeracy performance. This highlights the urgent need to address foundational literacy skills in early grades to improve performance across subjects.

Teachers' perspectives are valuable in assessing this issue, as they directly observe how pupils engage with text-based problems. According to a study by Cajayon (2022), Filipino teachers in public elementary schools observed that students with stronger reading comprehension tended to perform better at solving multi-step word problems. The teachers emphasized the importance of integrating reading instruction in math lessons.

Constructivist theory supports this integration, stating that learners build understanding by connecting new knowledge to prior experiences. Bruner (2000) emphasized that learning is more meaningful when concepts are presented within a context. In math education, this suggests that embedding language comprehension strategies within mathematical problem-solving tasks can lead to deeper understanding. The integration of literacy and numeracy instruction has been increasingly recognized in global education reforms. The UNESCO Global Education Monitoring Report (2016) advocates for cross-disciplinary teaching strategies that support foundational skills. It notes that numeracy and literacy are interdependent and must be developed in tandem to ensure a holistic reading outcome. In their study, Garcia and Santos (2022) examined the reading comprehension difficulties of Grade 4 learners in rural schools and found that vocabulary, lack of reading exposure, and ineffective instructional strategies were the most significant barriers. The study suggested that structured reading interventions, such as explicit vocabulary instruction and guided reading activities, could help improve comprehension. Similarly, Martinez et. al. (2023) explored the impact of interactive reading techniques in enhancing comprehension among Filipino learners. Their study revealed that using story-based discussions, graphic organizers, and teacher-led questioning significantly improved students' ability to understand and analyze texts.

Reyes and Dela Cruz (2023) conducted a study on the effectiveness of differentiated instruction in improving the reading comprehension skills of Grade 4 learners. Their findings showed that adapting

reading materials based on students' learning levels and providing varied instructional strategies significantly improved reading proficiency. Similarly, Soriano (2023) explored how teacher scaffolding and guided reading approaches affect reading comprehension. The study found that when teachers provided step-by-step support, encouraged active questioning, and facilitated discussions, learners showed better comprehension and text retention.

Word problem solving

Various intervention programs have attempted to bridge the gap between literacy and numeracy. For instance, the Reading and Math Integrated Development (ReMID) program in Southeast Asia showed that combining explicit reading instruction with contextual math tasks improved learner performance in both domains (Tan & Gonzales, 2020). These findings support the call for integrated instruction in Philippine classrooms.

Despite these developments, many schools still compartmentalize literacy and numeracy instruction. A study by Reyes and De Guzman (2021) noted that most Filipino teachers follow a subject-based approach due to curriculum limitations and time constraints. This separation hinders learners' opportunities to apply reading strategies in problem-solving contexts.

Finally, educational leadership plays a critical role in promoting integrated instruction. Teachers who are empowered through professional development and curriculum support are more likely to adopt cross-subject teaching approaches. As emphasized by Flores (2022), continuous learning opportunities for teachers lead to greater innovation in instructional practices, particularly in addressing learning gaps in reading and mathematics.

Burris (2011) conducted an insightful case study exploring the real-world application of differentiated instruction in Grades 3-5, particularly in Mathematics and Reading. By analyzing classroom observations, teacher interviews, and lesson plans, the study illuminated how teachers adapted their instruction based on student ability levels. They emphasized the importance of understanding learner differences and applying varied teaching strategies such as tiered assignments and flexible grouping. One of the key findings was that differentiation requires strong classroom management, collaborative planning time, and institutional support to be sustainable. Thus, the study serves as a foundational example of how differentiation can be meaningfully implemented in upper elementary mathematics when the right support structures are in place.

Furthermore, Lawson (2021) explored the effectiveness of mathematics stations as a form of differentiated instruction. The study took place in an elementary setting where students rotated through stations focused on different mathematical skills, each designed to match varying readiness levels. These stations allowed for independent learning, peer support, and teacher-guided interventions. Results indicated that students working in these differentiated environments showed measurable improvements in math proficiency, particularly in problem-solving and conceptual understanding. The research further reinforces that station-based instruction is a highly effective means of differentiation, especially when aligned with clear learning goals and student data.

Salazar and Gumanoy (2025) investigated the impact of differentiated learning activities on student motivation and engagement in the Grade 4 Mathematics classroom. Through a quasi-experimental design, they introduced learning centers and flexible grouping tailored to students' learning preferences. The study found that these strategies significantly improved students' enthusiasm for math, increased their confidence in problem-solving, and resulted in higher academic performance. The differentiated setup allowed learners to explore concepts at their own pace and according to their preferred modalities, creating a more inclusive and empowering learning environment. As a result, the study reinforces the close link between motivation and academic success and how well instruction is adapted to individual learners' needs.

Correspondingly, Hayden and Gubbins (2024) explored how the implementation of a new Mathematics curriculum affected teachers' use of differentiated instruction. Through surveys and interviews, they discovered that while educators valued differentiation for its benefits to student engagement, they also faced barriers such as time limitations and curriculum constraints. Many teachers modified lessons slightly instead of fully differentiating instruction due to workload and class size. The study concluded that unless curriculum reforms are supported by practical training and planning tools, differentiation remains an ideal rather than a reality. Hence, the research underscores the necessity of aligning curriculum changes with on-the-ground teacher support to ensure the effective application of differentiated practices.

Statement of the problems

This study assessed the relationship between reading comprehension and word problem-solving performance. Specifically, it addressed the following questions:

1. What is the level of the teachers' views on the reading comprehension skills of Grade 6 pupils?
2. What is the level of the teachers' views on the pupils' ability to solve mathematical word problems?
3. Is there a significant relationship between the teachers' views on reading comprehension and mathematical word problem solving?
4. What instructional guide do teachers recommend to bridge reading comprehension and problem-solving in the classroom?

Hypothesis

The relationship between reading comprehension and mathematical word problem solving, with the teacher's views and instructional strategies, implies that teachers who place greater importance on reading comprehension are more likely to recognize its role in enhancing students' ability to solve mathematical word problems. This significant relationship notes that numeracy and literacy are interdependent and must be developed in tandem to ensure a holistic reading outcome. This finding is similar to the study of Garcia and Santos (2022), who examined the reading comprehension difficulties of Grade 4 learners in rural schools and found that vocabulary, lack of reading exposure, and ineffective

Research methodology

This study employed a quantitative approach, utilizing a descriptive assessment and correlational research design. This research examines Grade 6 teachers' perceptions of the relationship between reading comprehension and mathematical word-problem solving among their pupils in the Bucay District. The population consisted of all grade 6 teachers assigned to public elementary schools in the Bucay District during the academic year 2025-2026. A total enumeration sampling strategy was employed, in which all 50 grade 6 teachers were invited to participate, thereby ensuring comprehensive coverage of the population. The instrument was validated by 3 experts and had a content validity of 3.67, indicating that it is a valid and suitable instrument for gathering the necessary data from the respondents. The instrument was tested with teachers outside the study area to assess reliability and internal consistency using Cronbach’s Alpha, yielding a coefficient of 0.87, indicating good consistency. Data was collected through questionnaires, and both descriptive and inferential statistics were used for analysis, specifically the weighted mean and Pearson's product-moment correlation coefficient (*r*). To facilitate data collection, the researcher obtained approval from the Schools Division Superintendent of Abra via a formal letter to distribute the questionnaires, and data were collected through teacher representatives.

In conducting research, ethical considerations were essential to ensure that the rights, dignity, and welfare of all participants were upheld. Conflict of interest was avoided by maintaining professional objectivity in the collection, interpretation, and reporting of data. Privacy and confidentiality were upheld by safeguarding respondents' identities and ensuring that all information provided was used solely for research purposes. Informed consent was obtained before participation, with respondents being fully apprised of the study’s objectives, procedures, and their right to withdraw at any time without penalty. Special attention was also given to vulnerability, recognizing that the school heads and teachers may have felt pressure to provide socially desirable responses. To mitigate this, assurances of confidentiality and the evaluative use of data were emphasized. An ethical review was considered, but because the study does not involve sensitive human issues, it was waived.

The following ranges of values in reading comprehension, with their descriptive interpretation, were used:

Norm	Statistical Range	Descriptive Rating	Overall Rating
4	3.26-4.00	Always (A)	Very High (VH)
3	2.51-3.25	Often(O)	High (H)
2	1.76 –2.50	Rarely (R)	Low (L)
1	1.0 -1.75	Never (N)	Very Low (VL)

To categorize the perceived word problem accomplishments, the Weighted Mean was used, and this scale is used:

Norm	Statistical Range	Descriptive Rating	Overall Rating
4	3.26-4.00	Strongly Agree (SA)	Very High (VH)
3	2.51-3.25	Agree (A)	High (H)

2	1.76 –2.50	Disagree (D)	Low (L)
1	1.0 -1.75	Strongly Disagree (SD)	Very Low (VL)

Data presentation and analysis

The data are presented in line with the study's objectives, collected through research questionnaires, and analyzed using statistical methods.

Problem 1: What is the level of the teachers' views on the reading comprehension skills of Grade 6 pupils?

Table 1: *The level of the teachers' views on the reading comprehension skills of Grade 6 pupils*

Items	Mean	DR
1. Pupils understand what is being asked about in word problems.	3.34	A
2. Pupils can extract relevant data from math word problems.	3.46	A
3. Pupils struggle with identifying operations needed for solving problems.	3.32	A
4. Pupils use strategies like drawing or acting out to solve problems.	3.36	A
5. Pupils check their answers after solving.	3.30	A
6. Mathematical vocabulary is clearly understood by pupils.	3.44	A
7. I explicitly teach how to break down word problems.	3.62	A
8. Pupils show confidence in solving multi-step problems.	3.32	A
9. Most pupils rely heavily on teacher guidance.	3.36	A
10. Word problems require higher-order thinking skills.	3.52	A
Overall Mean	3.40	VH

Source: Polya et al. (1995)

Legend:

Norm	Statistical Range	Descriptive Rating	Overall Rating
4	3.26-4.00	Strongly Agree (SA)	Very High (VH)
3	2.51-3.25	Agree (A)	High (H)
2	1.76 –2.50	Disagree (D)	Low (L)
1	1.0 -1.75	Strongly Disagree (SD)	Very Low (VL)

Based on the data presented in the table, teachers' views on the reading comprehension skills of Grade 6 pupils received a mean rating of 3.40, indicating an "Always" level. When examining the individual indicators, it is evident that all indicators fall within the same "always" mean rating level, including in explicitly teaching how to break down word problems that problems require higher- order thinking skills; pupils can extract relevant data from math word problems; mathematical vocabulary is clearly understood by pupils; pupils use strategies like drawing or acting out to solve problems and most pupils rely heavily on teacher guidance. Pupils understand what is being asked in word problems; however, they struggle to identify the operations needed to solve them. They show confidence in solving multi-step problems and check their answers after solving. This implies that reading comprehension plays a critical role in a child's ability to access and process information, not only in language subjects but across the curriculum. Pupils can also extract relevant data from math word problems and show confidence in

solving multi-step problems. Nonetheless, most pupils rely heavily on teachers' guidance. This finding concurs with Alqahtani (2020), who emphasized that vocabulary and comprehension are interrelated and necessary for learners to fully grasp the meaning of texts. In mathematics, where language is used to contextualize problems, learners with limited comprehension skills often misinterpret word problems, resulting in incorrect solutions.

Problem 2. What is the level of the teachers' views on the pupils' ability to solve mathematical word problems?

Table 2: *The level of the teachers' views on the pupils' ability to solve mathematical word problems*

Items	Mean	DR
1. Pupils with better reading comprehension solve word problems more accurately.	3.52	SA
2. Math performance is strongly tied to reading ability.	3.64	SA
3. Language difficulty is a barrier in math word problems.	3.56	SA
4. Integrating reading in math helps pupil performance.	3.74	SA
5. I co-plan lessons with reading and math integration.	3.30	SA
6. Pupils need explicit reading instruction in math classes.	3.76	SA
7. I use word problems in reading class as practice.	3.78	SA
8. Pupils should be assessed in both reading and math in word problems.	3.80	SA
9. Understanding sentence structure aids problem comprehension.	3.74	SA
10. I believe bridging reading and math improves critical thinking.	3.84	SA
Overall Mean	3.67	VH

Source: Polya et al. (1995)

As indicated by the data in the table, the teachers' views on the pupils' ability to solve mathematical word problems have a mean rating of 3.67, which falls under the "strongly agree" category. This suggests that the teachers believe that bridging reading and math improves critical thinking and that integrating reading into math improves pupil performance. They also view understanding sentence structure as aiding problem comprehension. Teachers use word problems in reading class for practice, and have observed that pupils need explicit reading instruction in math classes. When examining the individual items, all the indicators rated "strongly agree", such as on the ability of pupils to solve mathematical word problems; their belief that bridging reading and math improves critical thinking; that pupils should be assessed in both reading and word problems, and that they use word problems in reading class as a practice. Pupils need explicit reading instruction in math classes.

These three indicators are: integrating reading into math improves pupil performance, pupils with better reading comprehension solve word problems more accurately, and understanding sentence structure aids problem comprehension. Teachers strongly agree that math performance is closely tied to reading ability because language difficulties pose a barrier to solving math word problems. Pupils with better reading comprehension solve word problems more accurately. These teachers co-plan lessons that integrate reading and math. Various intervention programs have attempted to bridge the gap between literacy and numeracy. For instance, the Reading and Math Integrated Development (ReMID) program in Southeast

Asia showed that combining explicit reading instruction with contextual math tasks improved learner performance in both domains (Tan & Gonzales, 2020). These findings support the call for integrated instruction in Philippine classrooms. Despite these developments, many schools still compartmentalize literacy and numeracy instruction. A study by Reyes and De Guzman (2021) noted that most Filipino teachers follow a subject-based approach due to curriculum limitations and time constraints. This separation hinders learners' opportunities to apply reading strategies in problem-solving contexts. This finding also concurs with Salazar and Gumanoy's (2025) investigation on the impact of differentiated learning activities on student motivation and engagement in the Grade 4 Mathematics classroom. Through a quasi-experimental design, they introduced learning centers and flexible grouping tailored to students' learning preferences. The study found that these strategies significantly improved students' enthusiasm for math, increased their confidence in problem-solving, and resulted in higher academic performance.

Problem 3. Is there a significant relationship between the teachers' views on reading comprehension and mathematical word problem solving?

Table 3: *relationship between the teachers' views on reading comprehension and mathematical word problem solving*

<i>Reading Comprehension</i>	Pearson's r	Interpretation	p-value	Interpretation	Decision (Ho)
Mathematical word problem solving	0.330*	+ weak relationship	0.019	Significant	Reject

Note. * $p < .05$

The analysis of the relationship between teachers' views on reading comprehension and mathematical word-problem solving. The results show a weak positive correlation between the two variables with a Pearson correlation coefficient (r) of 0.330. This implies that teachers who place greater importance on reading comprehension are more likely to recognize its role in enhancing students' ability to solve mathematical word problems.

Moreover, the relationship is statistically significant, with a p-value of 0.019, which is below the significance level of 0.05. Therefore, the null hypothesis is rejected. This significant relationship notes that numeracy and literacy are interdependent and must be developed in tandem to ensure a holistic reading outcome. This finding is similar to the study of Garcia and Santos (2022), who examined the reading comprehension difficulties of Grade 4 learners in rural schools and found that vocabulary, lack of reading exposure, and ineffective instructional strategies were the most significant barriers. The study suggested that structured reading interventions, such as explicit vocabulary instruction and guided reading activities, could help improve comprehension when solving mathematical word problems.

Problem 4. What instructional guide do teachers recommend to bridge reading comprehension and problem-solving in the classroom?

An instructional guide for teachers is recommended to bridge the gap between reading comprehension and problem-solving in the classroom.

Title: Bridging Reading Comprehension and Problem Solving

Objective: To help students connect reading comprehension skills to solving word problems in math.

Target Audience: Elementary students (Grade 2-6)

Components:

1. Reading Comprehension Strategies

- Identifying key words and phrases
- Understanding context clues
- Making inferences and connections

2. Word Problem-Solving Steps

- Read and understand the problem
- Identify the question and key information
- Plan and solve the problem
- Check and reflect on the solution

3. Bridging Activities

- Text-marking and annotation
- Visualizing word problems (drawings, diagrams)
- Identifying math vocabulary and concepts in text
- Creating word problems from texts or scenarios

Instructional Sequence:

1. Model and Guide

- Teacher models reading and word problem-solving strategies
- Guided practice with feedback

2. Collaborative Practice

- Pair or small -group work on word problems
- Encourage discussion and sharing of strategies

3. Independent Practice

- Students work on word problems independently
- Teacher provides support as needed

4. Assessment Ideas:

- Observe students' problem-solving processes
- Review student work for accuracy and understanding
- Use quizzes or tests to assess comprehension and problem-solving skills

Results and discussion

Teachers consistently report that Grade 6 pupils can extract relevant information from mathematical word problems and demonstrate confidence in solving multi-step tasks. Although ratings vary slightly, the overall findings reflect a shared view that explicit instruction helps learners break down and understand problem statements. This suggests that pupils are developing higher-order thinking skills; however, many still rely on teacher guidance, indicating that independent mastery is not yet fully developed. These findings highlight the critical role of reading comprehension not only in language learning but across subject areas.

This aligns with Alqahtani (2020), who emphasized that vocabulary and comprehension are interdependent. In mathematics, limited comprehension often leads to misinterpretation of word problems. Similarly, Vilenius-Tuohimaa et al. (2020) identified reading comprehension as a strong predictor of success in mathematical problem solving, while Abedi and Lord (2001) noted that linguistic complexity can hinder students' ability to perform accurate computations. Supporting this, Cajayon (2022) found that Filipino learners with stronger reading comprehension perform better on multi-step word problems, reinforcing the need to integrate reading instruction into mathematics instruction.

The findings also affirm Burris (2011), who highlighted the value of differentiated instruction in addressing learner differences through strategies such as flexible grouping. Teachers in this study strongly agree that integrating reading and mathematics enhances critical thinking and improves performance. This is supported by Tan and Gonzales (2020), whose ReMID program demonstrated that combining reading instruction with contextualized math tasks improves outcomes. However, Reyes and De Guzman (2021) noted that many Filipino schools still follow a subject-based approach, limiting opportunities for integration.

Further, Salazar and Gumanoy (2025) showed that differentiated activities improve motivation, confidence, and performance, while Hayden and Gubbins (2024) emphasized that practical constraints often limit full implementation of differentiation. The relationship found between teachers' views on reading comprehension and mathematical problem solving confirms that literacy and numeracy are interconnected. Garcia and Santos (2022) similarly identified vocabulary and reading exposure as key factors influencing comprehension and recommended structured reading interventions.

Educational leadership also plays a crucial role. Flores (2022) emphasized that continuous professional development supports innovative and integrated teaching practices. From a theoretical perspective, these findings align with Cognitive Load Theory, which views reading comprehension as essential for processing mathematical problems. Strengthening literacy skills, therefore, supports more effective problem-solving.

Despite these contributions, the study has limitations. Its correlational design does not establish causation, and reliance on teachers' perceptions may introduce bias. The study's limited scope also affects generalizability, and other influencing factors may not have been fully captured. Future research should incorporate objective assessments, explore additional variables such as motivation and metacognition, and use broader or experimental designs to better understand the relationship between reading comprehension and mathematical problem solving.

Conclusion

This study examined the role of reading comprehension in solving mathematical word problems. The findings reveal that teachers consistently perceive an improvement in pupils' comprehension skills through explicit instruction in breaking down word problems and identifying relevant information. Teachers also reported a very high level of confidence in pupils' ability to solve mathematical word problems, emphasizing that integrating reading and mathematics enhances critical thinking and supports more meaningful assessment across both areas. Pearson's r results further confirmed a significant relationship between reading comprehension and mathematical problem solving, leading to the rejection of the null hypothesis.

These results suggest that difficulties in identifying appropriate operations may stem from gaps in comprehension rather than computation alone. Therefore, teachers should strengthen pupils' confidence in solving multi-step problems, encourage answer-checking strategies, and provide guided support as learners develop independence. Moreover, there is a clear need for collaborative lesson planning that integrates reading and mathematics. Addressing language barriers through explicit reading instruction within math lessons can improve both comprehension and accuracy in solving word problems. The implementation of an instructional guide that bridges reading comprehension and mathematical problem solving is therefore strongly recommended.

Author's contributions: This paper was written by John Mael S. Collado, with valuable assistance provided by her adviser, Dr. Elita B. Valdez

Conflict of interest statement: The author declares no conflict of interest.

Ethical review statement: The research is submitted to the ethical review board and approved for the conduct of the study. Ethical guidelines were put into this research.

Funding: The study is funded by the author.

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