



CHALLENGES ENCOUNTERED BY THE HIGH SCHOOL STUDENTS IN SOLVING WORD PROBLEMS IN MATHEMATICS 7 AS BASIS FOR CONTEXTUALIZED LITERACY AND NUMERACY INTERVENTION PROGRAM

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ABSTRACT

This 2026 study examined the challenges encountered by Grade 7 high school students in solving word problems in Mathematics as basis for developing a contextualized literacy and numeracy intervention program. Specifically, it described the respondents' profile in terms of age and sex, determined their performance in word problem solving, identified the challenges they encountered, tested significant differences when grouped according to profile, and examined the relationship between performance and perceived challenges. The study employed a descriptive research design using quantitative and qualitative approaches. A total of 197 Grade 7 students from Rang-ayan National High School, Schools Division of the City of Ilagan, served as respondents during School Year 2025–2026. Data were gathered through a structured questionnaire and school records, and were analyzed using frequency and percentage distribution, weighted mean, ANOVA, independent t-test, and Pearson r-correlation. Findings revealed that most respondents were aged 11 to 12 years, with a slightly higher number of male students. Students' performance in word problem solving was generally below the expected level, with many falling under the fairly satisfactory and did-not-meet-expectation categories. The major challenges encountered were test anxiety and time pressure, lack of problem-solving strategies, language barriers, difficulty translating word problems into mathematical formulas, poor reading comprehension, and difficulty selecting correct mathematical operations. Significant differences were found in performance and challenges when grouped according to age and sex. A significant relationship also existed between students' performance and the challenges encountered. Based on the findings, the study

proposed a Math Mentorship Program to strengthen students' literacy, numeracy, confidence, and problem-solving skills.

Keywords: *word problem solving, Mathematics 7, literacy and numeracy, learning challenges, math mentorship program*

INTRODUCTION

Mathematics constitutes an indispensable aspect of human existence, functioning as a fundamental tool for navigating daily life and addressing the complexities of the modern world. In contemporary society, mathematical competence transcends basic computation and necessitates proficiency in solving word problems, which demand conceptual understanding, logical reasoning, and critical thinking. Word problem-solving, which involves translating real-life situations into mathematical expressions, continues to pose significant challenges for many high school students. Learners frequently struggle to comprehend textual information, identify appropriate operations, and construct coherent solutions.

These difficulties arise from multiple factors, including language barriers, limited reading comprehension, challenges in translating verbal problems into mathematical formulas, difficulties in selecting correct operations, inadequate problem-solving strategies, and mathematics-related anxiety. Teachers consistently observe that students with weak reading comprehension skills often possess limited prior knowledge and restricted vocabulary, thereby impeding their ability to interpret texts and apply mathematical reasoning effectively. Strengthening reading comprehension is therefore essential, as it supports critical thinking and enables learners to engage more productively with mathematical tasks (Goc-Ong & Doronio, 2025; Verschaffel et al., 2020).

This perspective is substantiated by the study of Goc-Ong and Doronio (2025), which demonstrated that students' ability to read and understand mathematical materials significantly influenced their problem-solving performance. Their findings further revealed that integrating reading comprehension strategies into mathematics instruction enhanced learners' critical thinking and problem-solving abilities. Consequently, scholars and educators advocate for the incorporation of such strategies into classroom practice to strengthen mathematical understanding and improve overall learning outcomes (Goc-Ong & Doronio, 2025).

Translating mathematical word problems into appropriate formulas constitutes a complex cognitive process that demands the integration of reading comprehension and mathematical reasoning. Learners must simultaneously navigate the linguistic demands of the problem statement while discerning and applying the correct operations. This dual cognitive burden often results in confusion, frustration, and diminished confidence, thereby contributing to heightened levels of anxiety and stress that adversely affect overall performance (Ramirez et al., 2019; Reyes & Castillo, 2015).

Addressing these challenges is essential for the development of effective pedagogical strategies and targeted interventions. Through consistent practice, scaffolding, and guided instruction, students can gradually strengthen their confidence and enhance their problem-solving skills (Areelu et al., 2023; Mutia, 2025).

The urgency of these difficulties is underscored by international assessment results, particularly the Programme for International Student Assessment (PISA), where Filipino 15-year-old students scored an average of 14 points in the 2022 creative thinking assessment, well below the OECD average of 33 points (OECD, 2024). In the 2022 cycle, results released by the Organization for Economic Cooperation and Development (OECD) revealed that the Philippines ranked 76th out of 81 participating countries in reading comprehension, mathematics, and science. While the OECD reported average scores of 472 in mathematics, 476 in reading, and 485 in science, Filipino students scored markedly lower: 355 in mathematics (a slight improvement from 353 in 2018), 347 in reading (up from 340 in 2018), and 356 in science (a one-point decline from 357 in 2018). According to OECD metrics, every 20-point gap below the international average equates to approximately one year of lost learning for a 15-year-old student.

In the most recent international assessments, only 16 percent of Filipino students attained at least Level 2 proficiency in mathematics, a stark contrast to the OECD average of 69 percent. At this minimum level, learners are expected to interpret and recognize how simple real-world situations can be represented mathematically—for instance, comparing distances across alternative routes or converting prices into different currencies. Alarming, almost no Filipino students reached the highest performance levels (Level 5 or 6), whereas the OECD average for top performers was 9 percent. These findings underscore persistent systemic issues in the Philippine education system and highlight the urgent need for comprehensive reforms that strengthen literacy, enhance mathematical reasoning, and cultivate resilience in problem-solving.

Within the Philippine context, gender disparities in mathematics achievement remain evident. Recent assessments revealed that girls outperformed boys by 14 score points, with the proportion of low-performing students slightly higher among boys (86 percent) compared to girls (82 percent). Despite these differences, overall performance in mathematics remained relatively stable between 2018 and 2022 for both genders.

Drawing from the researcher's seven years of teaching experience in mathematics, it has been consistently observed that problem-solving constitutes one of the most challenging competencies for students. Learners frequently struggle not only with computational aspects but also with the reading and comprehension demands embedded in word problems. This difficulty becomes particularly pronounced in lessons involving operations on integers, fractions, ratio and proportion, and other topics requiring the interpretation of verbal information. Students often misinterpret mathematical terms, encounter challenges in translating verbal problems into mathematical symbols, and experience uncertainty in selecting the appropriate operations—addition, subtraction, multiplication, or division to arrive at correct solutions.

Moreover, the absence of effective problem-solving strategies aggravate these difficulties, leading to disengagement, diminished interest in mathematics classes, and heightened anxiety when confronted with problem-solving tasks. Consequently, these challenges underscore the persistent barriers students face in solving mathematical word problems. Addressing these issues necessitates the strengthening of foundational skills in both literacy and numeracy. By reinforcing these competencies, learners may enhance their mathematical proficiency, develop confidence in tackling problem-solving tasks, and ultimately achieve improved performance in mathematics.

Research Questions

This study was undertaken to examine the specific challenges encountered by high school students in solving mathematical word problems in Mathematics 7. The investigation sought to provide a systematic analysis of the difficulties faced by learners, thereby contributing to a deeper understanding of the factors that hinder effective problem-solving in mathematics.

In particular, the study aimed to address the following research questions:

1. What is the profile of the high school student-respondents in terms of the following variables?
 - a. age
 - b. sex
2. How do high school students perform in word problem solving in mathematics 7?
3. Is there a significant difference in the performance of high school students in word problem solving in Mathematics 7 when grouped according to profile?
4. What are the challenges encountered by the high school students in solving word problems in Mathematics 7 in terms of:
 - a. language barrier
 - b. poor reading comprehension
 - c. translating word problems into mathematical Formulas
 - d. selecting the correct mathematical operation
 - e. lack of problem-solving strategies
 - f. test anxiety and time pressure
5. Is there a significant difference in the challenges encountered in Mathematics by the students when grouped according to profile?
6. Is there a significant relationship between the performance of the students and the challenges encountered in word problem solving in Mathematics 7 as perceived by them?
7. What intervention program can be proposed to improve students' word problems solving skills?

METHODOLOGY

Research Design

This study employed a descriptive research design, which, as Jenkins-Smith et al. (n.d.) explain, involves a systematic set of steps for collecting and analyzing research data. The design was complemented by both quantitative and qualitative approaches, thereby ensuring methodological rigor and comprehensive analysis. The quantitative component draws upon the methods of the natural sciences, producing numerical data and verifiable facts. Such data were presented through statistical tools, including graphs and tables, to provide clarity and precision in illustrating patterns and relationships.

In contrast, the qualitative component allowed the researcher to generate insights and theoretical perspectives from the observations and responses of participants. Qualitative inquiry served as a means of obtaining richer descriptions and contextual explanations, thereby clarifying and deepening the interpretation of quantitative findings. The narratives and perspectives provided by respondents were used as a basis for explaining particular results derived from the quantitative analysis, ensuring that the study captured both measurable outcomes and contextual meanings.

Through the integration of these approaches, the research design provided a balanced framework for describing existing conditions and interpreting the relationships among variables, while simultaneously grounding the findings in both empirical evidence and respondent perspectives.

Locale of the Study

The study was conducted at Rang-ayan National High School, situated within the Schools Division of the City of Ilagan. The institution was selected as the research locale due to its accessibility to the researcher's residence and its suitability for facilitating the collection and administration of data.

Selection and Description of Respondents

A total of 197 Grade 7 students enrolled at Rang-ayan National High School during the School Year 2025–2026 served as the respondents of the study. The choice of the school was further justified by the researcher's affiliation with the institution, which provided convenience in coordinating, gathering, and managing the necessary data for the investigation. The table below shows the distribution of respondents.

Grade & Section	Population	%
Grade 7 – Andromeda	50	25.38
Grade 7 – Aquarius	50	25.38
Grade 7 – Aquila	47	23.86
Grade 7 – Aries	50	25.38
Total	197	100

Data Gathering Procedure

To commence the conduct of the study, the researcher formally sought permission from the Schools Division Superintendent. Upon receiving approval, a subsequent request was submitted to the School Principal to secure authorization for the administration of the research instruments.

The primary data were collected directly from the respondents through the use of a structured questionnaire. To strengthen and substantiate the findings, secondary data were also obtained from the official school database.

The researcher personally administered the survey to ensure that respondents' inquiries were immediately addressed, thereby minimizing potential misunderstandings. This direct involvement also facilitated the smooth retrieval of the questionnaires and helped guarantee the completeness and integrity of the collected data.

Statistical Treatment of Data

To treat the data gathered from the respondents, the researcher used the frequency and percentage count, weighted mean, ANOVA, and the Pearson-r test.

Frequency and Percentage Distribution. Frequency and percentage distribution were employed to describe the demographic profile of the high school student-respondents, specifically in terms of age and sex. This method facilitated a systematic presentation of the respondents' characteristics.

Weighted Mean. The weighted mean was utilized to present the level of responses gathered, particularly in determining the challenges encountered by the students. This statistical measure provided a comprehensive representation of the collective perceptions of the respondents.

Analysis of Variance (ANOVA). Analysis of Variance was applied to examine whether the demographic profile of the high school students influenced their performance in solving word problems in Mathematics. Furthermore, ANOVA was used to determine whether significant differences existed in the challenges encountered by students when grouped according to their profile variables. The test was conducted at the 0.05 level of significance.

Pearson r-Correlation. The Pearson r-correlation was employed to assess the relationship between the students' performance in Mathematics and the challenges they encountered. This statistical tool enabled the identification of both the strength and direction of the correlation, thereby clarifying the extent to which performance outcomes were associated with the challenges faced by the respondents.

RESULTS AND DISCUSSION

1. What is the profile of the respondents in terms of:

a. Age

Table 1-A
Frequency and Percentage Distribution of the Respondents in Terms of Age

Age	F	%
11-12	161	81.73
13-14	32	16.24
15 above	4	2.03
Total	197	100

Table 1-a shows the age distribution of the respondents in terms of their age. As reflected in the table, 161 respondents, representing 81.73 percent of the sample, are within the age range of 11 to 12 years, while only four respondents, or 2.03 percent, are aged 15 years and above. In accordance with DepEd Order No. 21, s.2019, which stipulates the Policy Guidelines on the K to 12 Basic Education Program, the prescribed age requirement for learners entering Grade 7 is 12 years old. This distribution indicates that the majority of respondents fall within the expected age range for their grade level. Conversely, the small proportion of overaged learners suggests that only a few students may have experienced late school entry, grade repetition, or interruptions in schooling attributable to personal, familial, or socioeconomic circumstances.

Owino et al. (2022) emphasized that grade repetition significantly influences student age profiles, with many learners falling behind due to disengagement and dissatisfaction with prolonged schooling. Their findings revealed that overaged students often demonstrated poor concentration, limited self-control, and disruptive behaviors such as bullying during collaborative activities. These tendencies adversely affected the teaching–learning process, not only diminishing their own academic performance but also impeding classroom dynamics. Moreover, the cycle of low achievement and repeated grade retention fostered dissatisfaction among these learners, leading some to eventually withdraw from formal education.

b. Sex

Table 1-B
Frequency and Percentage Distribution of the Respondents in Terms of Sex

Sex	F	%
Male	102	51.78
Female	95	48.22
Total	197	100

Table 1-B presents the distribution of respondents according to sex. As reflected in the table, 102 respondents, representing 51.78 percent of the sample, are male, while 95 respondents, comprising 48.22 percent, are female. This indicates a slight predominance of male participants in the study.

Cabuquin and Abocejo (2023) underscore that such distribution demonstrates that both male and female learners are capable of attaining academic success, thereby affirming that gender is not a limiting factor in educational achievement. In this regard, secondary learning institutions must ensure that mathematics instruction and classroom activities provide equitable opportunities for all learners, regardless of sex. Teachers are tasked with fostering critical thinking and problem-solving skills, integrating real-world applications into lessons, and cultivating learners' confidence and motivation to excel academically. Such pedagogical practices not only enhance mathematical competence but also promote inclusive and equitable learning environments.

2. How do high school students perform in word problem solving in Mathematics 7?

Table 2
Frequency and Percentage Distribution of the Respondents in Terms of Mathematics Performance in Problem Solving

Mathematics Performance in Problem Solving	f	%
Outstanding (90-100%)	26	13.2
Very Satisfactory (85-89%)	24	12.2
Satisfactory (80-84%)	22	11.2
Fairly Satisfactory (75-79%)	73	37
Did Not Meet Expectation (75 below)	52	26.4
Total	197	100

Table 2 exhibits the Mathematics performance of the Grade 7 respondents in problem solving. Out of 197 students, 26 or 13.2 percent demonstrated "Outstanding" performance, while 52 or 26.4 percent fell under the "Did Not Meet Expectation" category. These results indicate that the majority of Grade 7 learners are performing below the satisfactory level, suggesting that more than half of the students are struggling to attain the expected mathematical proficiency in problem solving. One plausible explanation for this observed performance is the lack of strong foundational mathematical skills among the learners. Several students may have advanced to Grade 7 with gaps in basic operations—addition, subtraction, multiplication, and division—as well as limited number sense, including difficulties with place value, fractions, and decimals. These foundational

competencies are critical for comprehending the higher-level mathematical concepts introduced at this stage.

This finding corroborates earlier studies by Mutia (2025), which emphasize the necessity for students to consistently review fundamental operations in arithmetic, algebra, and geometry to reinforce their mathematical foundation. Regular engagement in problem-solving exercises is likewise essential to sharpen reasoning abilities and enhance retention of mathematical principles. Furthermore, when confronted with challenging concepts, learners are encouraged to adopt a proactive approach by seeking assistance from teachers, peers, or family members, thereby fostering resilience and persistence in mathematical learning.

3. Is there a significant difference in the performance of high school students in word problem solving in Mathematics 7 when grouped according to profile?

a. Age

Table 3-A
Results of the Test of Significant Difference in the Performance of High School Students in Word Problem Solving in Mathematics 7 When Grouped According to Age

Age in years	Performance in Word Problem Solving	p-value	Analysis	Decision	Remarks
11	91.1	< 0.001	$p < 0.05$	Reject H_0	Significant
12	79.8				
13	76.1				
14	74.2				
15	70.3				
16	70.0				

Table 3-A presents the results of the test of significant differences in the performance of high school students in solving word problems in Mathematics 7 when grouped according to age, utilizing the non-parametric one-way Analysis of Variance (ANOVA) at the 0.05 level of significance. As reflected in the table, students aged 11 years attained the highest performance scores, whereas those aged 16 years recorded the lowest. This outcome suggests that younger students exhibit comparatively stronger performance in word problem solving than their older counterparts.

Furthermore, the results reveal that the computed p-value is less than the 0.05 threshold of significance; hence, the null hypothesis is rejected. This indicates that students' performance in word problem solving differs significantly across age groups. Notably, these findings contradict the study of Saka (2021), which reported no significant effect of age on students' academic achievement in Mathematics. Saka's work implies

that age alone does not determine performance in solving mathematical problems, as students tend to perform similarly when exposed to the same curriculum, instructional strategies, and learning conditions.

b. Sex

Table 3-B
Results of the Test of Significant Difference in the Performance of High School Students in Word Problem Solving in Mathematics 7 When Grouped According to Sex

Age in years	Performance in Word Problem Solving	p-value	Analysis	Decision	Remarks
Male	77.3	< 0.001	$p < 0.05$	Reject H_0	Significant
Female	81.5				

Table 3-B reveals the results of the test of significant differences in the performance of high school students in solving word problems in Mathematics 7 when grouped according to sex, utilizing the non-parametric Independent t-test at the 0.05 level of significance. As indicated in the table, female students obtained higher performance scores compared to their male counterparts. This finding suggests that female students tend to demonstrate stronger performance in word problem solving than male students.

Moreover, the results reveal that the computed p-value is less than the 0.05 threshold of significance; hence, the null hypothesis is rejected. This indicates that students' performance in word problem solving differs significantly when grouped according to sex. Thus, the data confirm that performance varies between male and female students.

It is noteworthy, however, that mathematics performance does not consistently differ between sexes across studies. Mathematics has often been socially perceived as a male domain, with female learners reporting lower levels of motivation and less positive attitudes toward the subject compared to males. Nevertheless, the findings of Hofer et al. (2022) revealed no systematic gender differences in mathematics achievement, thereby underscoring that performance outcomes may be shaped more by contextual and motivational factors than by sex alone.

4. What are the challenges encountered by the high school students in solving word problems in Mathematics 7 in terms of:

a. Language Barrier

Table 4-A
The Challenges Encountered in Problem Solving as to Language Barrier

Challenges	Mean	Description
1. Language barriers make it harder for me to understand the wording of math problems.	3.72	Strongly Agree
2. I often struggle to identify key information in a word problem due to language differences.	3.37	Strongly Agree
3. If the word problem is not written in my native language, I can't solve it much more efficiently and accurately.	3. 72	Strongly Agree
4. When solving word problems, I sometimes misinterpret the instructions because of unfamiliar vocabulary or phrasing.	3.49	Strongly Agree
5. Language differences in word problems lead to errors in my calculations or logical reasoning.	3.76	Strongly Agree
Weighted Mean	3.61	Strongly Agree

Table 4-A displays the summary of the mean and descriptive interpretation on the challenges encountered in problem solving by the high school students in terms of language barrier. The data reveal a mean score of 3.61, which is descriptively interpreted as Strongly Agree.

This result indicates that the language barrier is a significant challenge encountered by students in solving word problems in mathematics. Many learners strongly agree that difficulties in understanding the language used in word problems hinder their ability to fully comprehend the problem statements. These challenges may include unfamiliar vocabulary, complex sentence structures, and ambiguous phrasing, which can confuse students and prevent them from identifying key information required to solve the problem.

This findings is in consonance with the findings of Yonson (2017) that language plays an important role in understanding word problems in mathematics and emphasized that language should not be only the focus in understanding the problem, but it can be helpful for a student to work out the problem he is encountering.

b. Reading Comprehension

Table 4-B
The Challenges Encountered in Problem Solving as to Reading Comprehension

Challenges	Mean	Description
1. When I struggle with reading comprehension, I tend to give up on solving math problems faster.	3.53	Strongly Agree
2. When reading math problems, I find that poor reading comprehension leads to misinterpretation of the problem.	3.59	Strongly Agree
3. I often need to reread math word problems multiple times to fully understand them before I can solve them.	3.79	Strongly Agree
4. Lack of reading materials and textbook affects my reading skills.	3.6	Strongly Agree
5. Parental guidance and tutorial reading at home do not contribute in enhancing my understanding and analyzing reading selection.	1.64	Disagree
Weighted Mean	3.23	Strongly Agree

Table 4-B presents the summary of the mean scores and their descriptive interpretation regarding the challenges encountered by high school students in problem solving, specifically in relation to poor reading comprehension. The findings reveal that Grade 7 learners demonstrate limited proficiency in reading comprehension, which necessitates consistent guidance and support throughout the problem-solving process. This limitation underscores the critical role of reading comprehension as a foundational skill in mathematics learning, since the ability to decode, interpret, and analyze textual information directly influences students' capacity to engage with mathematical problems.

This result is further affirmed by Areelu (2023), who emphasized that mathematics functions not only as a discipline of numbers and operations but also as a powerful tool for communication and global understanding. Mathematics fosters logical reasoning, critical thinking, and problem-solving abilities, while simultaneously enhancing effective communication skills. Thus, the observed challenges in reading comprehension highlight the need for integrative instructional approaches that strengthen literacy skills alongside mathematical competencies, ensuring that learners are equipped to navigate complex problem-solving tasks with clarity and confidence.

c. Translating Word Problems into Mathematical Formulas

Table 4-c
The Challenges Encountered in Problem Solving as to Translating Word Problems into Mathematical Formulas

Challenges	Mean	Description
1. I often struggle with understanding how to set up the math formulas in word problems.	3.66	Strongly Agree
2. Sometimes, the wording of word problems makes it difficult to identify the correct formulas.	3.47	Strongly Agree
3. I find it difficult to translate word problems into formulas	3.63	Strongly Agree
4. I don't understand the steps needed to convert a word problem into a mathematical expression.	3.51	Strongly Agree
5. The language used in word problems can be confusing.	3.49	Strongly Agree
Weighted Mean	3.55	Strongly Agree

Table 4-C shows the summary of the mean scores and descriptive interpretation regarding the challenges encountered by high school students in problem solving, specifically in translating word problems into Mathematical formulas. The results indicate that Grade 7 students experience considerable difficulty in this area, which often leads to unsuccessful attempts at problem solving.

This finding resonates with the study of Ramirez et al. (2019), who emphasized that translating worded problems into mathematical expressions is among the most challenging tasks faced by learners. More critically, such difficulty becomes a significant impediment to effective learning, as students struggle to bridge the gap between linguistic comprehension and mathematical representation.

d. Selecting the Correct Mathematical Operation

Table 4-D
The Challenges Encountered in Problem Solving as to Selecting the Correct Mathematical Operation

Challenges	Mean	Percentage
1. I am sometimes confused which operation to use.	3.59	Strongly Agree

2. I need more practice to get better at selecting the correct operation.	3.82	Strongly Agree
3. I often struggle to identify whether a problem requires one or multiple operations.	3.46	Strongly Agree
4. Real-life examples do not help me understand when to use different operations.	1.39	Disagree
5. Misunderstanding a word problem often leads me to choose the wrong operation.	3.6	Strongly Agree
Weighted Mean	3.17	Strongly Agree

Table 4-D presents the mean scores and corresponding descriptive interpretation of the challenges encountered by Grade 7 students in problem solving, specifically in terms of Selecting the Correct Mathematical Operation. The findings suggest that learners must carefully reread the problem and highlight critical details such as numerical values or verbal cues—that signal the appropriate operation to be performed. This process of identifying relevant information is essential for determining the correct mathematical procedure.

Consistent with the study of Ramiro (2024), students who struggle with problem solving often encounter difficulties in literacy-related skills, such as recognizing given information and discerning the required operation. These challenges hinder their ability to establish connections between mathematical concepts and numeracy skills, particularly in constructing number sentences and deriving accurate solutions. Such findings underscore the interplay between literacy and numeracy competencies in mathematical problem solving, highlighting the need for instructional strategies that strengthen both domains.

e. Lack of Problem-Solving Strategies

Table 4-E
The Challenges Encountered in Problem Solving as to Lack of Problem-Solving Strategies

Challenges	Mean	Percentage
1. I often struggle to find a clear strategy when solving math problems.	3.69	Strongly Agree
2. Lack of problem-solving strategies makes word problems harder for me.	3.66	Strongly Agree
3. I would perform better in math if I had more structured problem-solving strategies.	3.49	Strongly Agree
4. I rely more on guessing the strategy when I solve complex math problems.	3.6	Strongly Agree

5. Not having a specific problem-solving strategy makes math problems more frustrating.	3.76	Strongly Agree
Weighted Mean	3.64	Strongly Agree

Table 4-E presents the summary of the mean scores and descriptive interpretation regarding the challenges encountered by high school students in problem solving, specifically in terms of the “Lack of Problem-Solving Strategies.” To address the various difficulties experienced by Grade 7 learners, it is imperative that teachers employ diverse instructional strategies and innovative approaches. One such approach is self-regulated learning, which encourages students to set clear learning goals, plan and organize tasks, monitor their comprehension, and reflect on their performance to adjust strategies accordingly. Through this pedagogical intervention, teachers empower students to actively manage their own learning, cultivate problem-solving competencies, and develop greater independence and confidence as learners.

f. Test Anxiety and Time Pressure

Table 4-F
The Challenges Encountered in Problem Solving as to Test Anxiety and Time Pressure

Challenges	Mean	Percentage
1. I feel anxious when I have to solve math problems under time pressure.	3.71	Strongly Agree
2. Time limits on tests make it harder for me to think clearly.	3.6	Strongly Agree
3. I perform worse on math tests due to nervousness	3.68	Strongly Agree
4. I often feel rushed when working on word problems during a timed test.	3.69	Strongly Agree
5. Knowing the time is running out increases my stress level.	3.62	Strongly Agree
Weighted Mean	3.66	Strongly Agree

The data reflected in Table 4-F reveal consistently high levels of agreement among respondents regarding the challenges posed by test anxiety and time pressure in mathematical problem solving. All five indicators yielded mean scores ranging from 3.60 to 3.71, with a weighted mean of 3.66, interpreted as Strongly Agree. This indicates a pervasive perception that time constraints significantly exacerbate anxiety and hinder performance.

The respondents strongly affirmed that solving mathematical problems under time constraints precipitates heightened anxiety. This finding suggests that time-bound assessments intensify emotional stress, which in turn may impair cognitive processing.

The imposition of time restrictions was reported to diminish clarity of thought, indicating that cognitive load increases when students are pressured by deadlines, thereby reducing problem-solving efficiency. Nervousness was identified as a direct contributor to poorer test outcomes, underscoring the detrimental impact of affective factors on academic achievement.

Moreover, students expressed difficulty in managing word problems within limited time frames, implying that complex tasks requiring comprehension and reasoning are particularly vulnerable to time-induced stress. The awareness of dwindling time was found to elevate stress levels, reinforcing the notion that external cues of time scarcity amplify anxiety. These findings highlight that test anxiety and time pressure are interrelated constructs that jointly undermine mathematical performance.

The elevated weighted mean (3.66) indicates that these challenges are not isolated experiences but rather systemic issues affecting the majority of respondents. This result aligns with established literature on test anxiety and time pressure, which emphasizes the adverse consequences of stress on working memory, reasoning, and problem-solving accuracy. Collectively, the evidence underscores the need for pedagogical interventions that mitigate time-related stressors and foster supportive assessment practices to enhance students' mathematical performance. Based on the findings of Reyes & Castillo (2015), teachers need to conduct stress briefing to the students through the proctor before taking the exam; provide a reward system in mathematics classes; and adapt fun learning techniques in teaching mathematics.

g. Summary

Table 4-G
Summary of the Challenges Encountered by the Respondents

Challenges	Mean	Description
a. Language Barrier	3.61	Strongly Agree
b. Poor Reading Comprehension	3.23	Strongly Agree
c. Translating Word Problems into Mathematical Formulas	3.55	Strongly Agree
d. Selecting the Correct Mathematical Operation	3.17	Strongly Agree
e. Lack of Problem-Solving Strategies	3.64	Strongly Agree
f. Test Anxiety and Time Pressure	3.66	Strongly Agree
Overall Weighted Mean	3.48	Strongly Agree

Table 4-G presents the summary of the problems encountered by the respondents in solving word problems in Mathematics. As shown in the table, the most significant challenge reported by the high school students is test anxiety and time pressure, which obtained the highest mean score of 3.66. This finding indicates that psychological factors

such as stress and pressure substantially hinder students' ability to perform effectively in Mathematics. While many students may understand the lesson conceptually, the presence of anxiety and time constraints impairs their capacity to apply knowledge in problem-solving situations.

In contrast, the challenge of selecting the correct mathematical operation received the lowest mean score of 3.17. This suggests that students generally possess relatively stronger skills in identifying appropriate operations compared to coping with language, comprehension, or anxiety-related difficulties. Nonetheless, all respondents reported experiencing challenges in solving word problems, highlighting that difficulties in understanding problem statements, interpreting mathematical language, and applying suitable problem-solving strategies are common across the group.

These findings underscore the need for targeted instructional interventions aimed at strengthening both mathematical comprehension and problem-solving skills. Moreover, the results contradict earlier studies which consistently identify word problems as among the most difficult tasks for Mathematics learners. For instance, Verschaffel et al. (2020) emphasize that students with limited metacognitive skills often struggle with understanding problem contexts, selecting appropriate strategies, and monitoring their solution processes. The present findings therefore suggest that while operational selection may be less problematic, affective and cognitive barriers—particularly anxiety and comprehension—remain critical areas requiring pedagogical

5. Is there a significant difference in the challenges encountered in Mathematics by the students when grouped according to profile?

a. Age

Table 5-A
Results of the Test of Significant Difference in the Challenges Encountered by Students in Solving Word Problems in Mathematics 7 When Grouped According to Age Profile

Age in years	Mean	p-value	Analysis	Decision	Remarks
11	3.24	< 0.001	P < 0.05	Reject H ₀	Significant
12	3.49				
13	3.59				
14	3.64				
15	3.77				
16	3.78				

Table 5-A presents the results of the test of significant differences in the challenges encountered by Grade 7 students in solving word problems in Mathematics when grouped according to age, utilizing the non-parametric one-way Analysis of Variance (ANOVA) at the 0.05 level of significance. As reflected in the table, students aged 11 years obtained the lowest mean scores, indicating that they experienced the least level of challenges in

Mathematics. In contrast, students aged 15 and 16 years registered the highest mean scores, suggesting that older students encountered greater challenges in solving word problems. This pattern implies that the level of challenges tends to increase as age advances.

Moreover, the computed p-value is less than 0.001, which is significantly lower than the 0.05 threshold of significance. Consequently, the null hypothesis is rejected. This finding establishes that there is a statistically significant difference in the challenges encountered by students in Mathematics when grouped according to age. It further indicates that age exerts a significant influence on the extent of challenges experienced by students in solving mathematical word problems.

b. Sex

Table 5-B
Results of the Test of Significant Difference in the Challenges Encountered by Students in Solving Word Problem in Mathematics 7 When Grouped According to Sex

Sex	Mean	p-value	Analysis	Decision	Remarks
Male	3.56	< 0.001	$p < 0.05$	Reject H_0	Significant
Female	3.45				

Table 5-B shows the results of the test of significant difference in the challenges encountered by Grade 7 students in solving word problems in Mathematics when grouped according to sex, utilizing the non-parametric Independent t-test at the 0.05 level of significance. As reflected in the table, male students obtained higher mean scores compared to female students, indicating that they experienced greater challenges in solving mathematical word problems.

Furthermore, the computed p-value is less than the 0.05 threshold of significance; hence, the null hypothesis is rejected. This establishes that there is a statistically significant difference in the challenges encountered by students when grouped according to sex. The findings therefore imply that sex constitutes a significant factor influencing the extent of challenges experienced by students in solving word problems in Mathematics 7.

6. Is there a significant relationship between the performance of the students and the challenges encountered in Mathematics as perceived by them?

Table 6
Results of Significant Relationship Between the Performance of the Students and the Challenges Encountered in Mathematics as Perceived by Them

Performance and challenges encountered	P-value	Alpha Level	Analysis	Decision	Remarks
Performance and Language Barrier	<0.001	0.05	$p < 0.05$	Reject H_0	significant
Performance and Poor Reading Comprehension	<0.001	0.05	$p < 0.05$	Reject H_0	significant
Performance and Translating Word Problems into Mathematical Formulas	<0.001	0.05	$p < 0.05$	Reject H_0	Significant
Performance and Selecting the Correct Mathematical Operation	<0.001	0.05	$p < 0.05$	Reject H_0	Significant
Performance and Lack of Problem-Solving Strategies	<0.001	0.05	$p < 0.05$	Reject H_0	Significant
Performance and Test Anxiety and Time Pressure	<0.001	0.05	$p < 0.05$	Reject H_0	Significant

Table 6 shows the summary of the test of significant relationship between the academic performance of the student-respondents and the challenges they encountered in Mathematics, as analyzed using the Pearson r test at the 5% level of significance. As reflected in the table, the computed p-values for performance and challenges in Mathematics are less than 0.001, which is below the 0.05 threshold of significance. Consequently, the null hypothesis is rejected, indicating a statistically significant relationship between students' academic performance and the challenges they face in Mathematics.

This finding suggests that the difficulties experienced by students in Mathematics exert a crucial influence on their academic outcomes in the subject. It underscores the importance of systematically addressing these challenges to enhance learning effectiveness and improve performance.

Moreover, this result corroborates the study of Zhu and Wu (2023), which emphasized that students with initially high scores identified mathematics reading skills as a critical challenge that significantly contributed to their value-added performance. Their ability to effectively read, interpret, and comprehend mathematical texts, symbols, and problem statements enabled them to engage more deeply with mathematical concepts and to solve problems with greater accuracy.

7. What intervention program can be proposed to improve students' word problems solving skills?

I. Program Title: Math Mentorship Program (MMP)

II. Rationale

Word problems represent one of the most complex challenges encountered by mathematics learners, often requiring higher-order thinking skills that extend beyond routine computation. To address these difficulties, intervention activities are essential not only to enhance learners' academic success but also to mitigate negative behavioral tendencies. However, the effectiveness of such interventions ultimately depends on equipping students with the necessary problem-solving competencies in mathematics.

The decline in numerical literacy among learners was aggravated by the two-year educational disruptions caused by the COVID-19 pandemic, which created significant gaps in foundational mathematical skills. A strategic response to this challenge is the implementation of a structured intervention program, the Math Mentorship Program (MMP). This program provides targeted mentorship designed to strengthen mathematical understanding, refine problem-solving abilities, and foster positive attitudes toward mathematics through guided instruction and continuous monitoring.

Empirical research and educational practice consistently demonstrate that mentorship enhances academic performance, motivation, and self-efficacy, particularly among students who are struggling or underrepresented in mathematics. Unlike traditional classroom instruction, mentorship emphasizes personalized, relationship-based learning. This approach enables mentors to identify individual learning gaps, adapt instructional strategies, and reinforce key concepts at a pace appropriate to each learner. By integrating mentorship into mathematics education, schools can create a supportive environment that not only addresses immediate learning difficulties but also cultivates long-term resilience and confidence in mathematical problem solving.

Additionally, the implementation of a structured mathematics mentorship program fosters equity and access among learners. Students from disadvantaged backgrounds often experience limited academic support outside the classroom, which contributes to persistent gaps in mathematical achievement. Mentorship serves as a bridging mechanism by providing consistent guidance, early intervention, and exposure to academic pathways in mathematics.

The intervention program will be systematically initiated during the free periods of identified recipients, with sessions scheduled for one hour twice a week. Furthermore, remedial teaching will be integrated into regular class hours through brief, targeted interventions lasting fifteen minutes. These sessions will adopt a face-to-face modality to ensure direct instructional support and immediate feedback.

This dual approach—mentorship and remedial teaching aims to enhance students' problem-solving competencies, mitigate barriers to learning, and promote equitable

opportunities for academic success. Ultimately, the program seeks to empower learners to realize their full potential in mathematics by addressing both cognitive and contextual challenges that hinder achievement.

III. Program Objectives

General Objective:

To improve learners' mathematical performance through structured, individualized mentorship support.

Specific Objectives:

By the end of the program, learners will be able to:

1. Improve understanding of key concepts (e.g., arithmetic, algebra, problem-solving).
2. Increase confidence and positive attitude toward mathematics.
3. Demonstrate improved performance in quizzes, activities, and assessments.
4. Apply mathematical concepts to real-life situations.

IV. Target Learners

- Students identified through their Mathematics Performance in Problem Solving
- Students identified as **at risk** or needing remediation
- Recommended grade level: *(Grade 7 / Junior High School)*

V. Implementation Plan

A. Duration:

- 4–8 weeks
- 1–2 sessions per week
- 1 hour per session

B. Mentors:

- Mathematics teachers
- High-performing students (peer mentors)
- Trained volunteers

C. Mentoring Structure:

- One-on-one or small group (1 mentor : 2–4 mentees)
- Diagnostic-based instruction

VI. Program Activities

Challenges	Activities	Description
Language Barrier	Math Vocabulary Builder	Introduce key words (sum, difference, total, more than, less than, equal)

Poor Reading Comprehension	Chunk the Word Problem	Break the problem into: • What is given? • What is asked?
Translating word Problems into Mathematical Formulas	Math Language to Symbol Matching	Match phrases with symbols: • “sum of” $\rightarrow +$ • “difference between” $\rightarrow -$ • “product of” $\rightarrow \times$ • “divided by” $\rightarrow \div$
Selecting the Correct Mathematical Operation	Operation Meaning Review	Discuss what each operation means using real-life examples: • Addition = putting together • Subtraction = comparing or taking away • Multiplication = equal groups • Division = sharing or grouping
Lack of Problem-solving Strategies	Teach a Standard Problem-Solving Framework	Introduce a simple framework such as R-U-S-E : • Read the problem • Understand what is asked • Solve using a plan • Evaluate the answer
Test Anxiety and Time Pressure	Reflection and Confidence Check	Students reflect on what helped them feel calmer

VII. Materials Needed

- Worksheets and activity sheets
- Manipulatives (counters, blocks, number lines)
- Calculators (if applicable)
- Whiteboard / chart paper
- Diagnostic and post-test tools

Conclusions

Based on the foregoing findings, it can be concluded that the Grade 7 respondents demonstrated fairly satisfactory performance in Mathematics 7 and encountered persistent challenges in solving word problems. These difficulties primarily stemmed from language barriers, which hindered students' comprehension of problem statements and their ability to translate verbal contexts into mathematical symbols and operations. Moreover, limited comprehension skills, unfamiliarity with mathematical terms, and insufficient practice in applying problem-solving strategies further contributed to their struggles. Such constraints often manifested in heightened nervousness and fear of failure during assessments, thereby reducing concentration, logical reasoning, and ultimately resulting in lower scores in word problem-solving tasks.

To address these challenges, the study proposes the implementation of a structured Math Mentorship Program (MMP). This intervention targets selected Grade 7 students identified through their mathematics performance in problem solving. The program is envisioned to provide guided instruction, sustained practice, and personalized mentorship, thereby strengthening foundational comprehension, enhancing problem-solving strategies, and fostering confidence in mathematical reasoning. Through this initiative, students are expected to overcome linguistic and cognitive barriers, improve their proficiency in solving word problems, and cultivate resilience in mathematics learning.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are advanced to strengthen students' competencies in solving mathematical word problems:

1. Strengthen Reading and Comprehension Skills

- a) English teachers (Aral Reading Tutors) should integrate cognitive strategies to enhance reading comprehension in a second language, while Mathematics teachers embed reading strategies into math lessons to support accurate interpretation of word problems.
- b) The School Reading Coordinator should provide guidance, resources, and oversight to ensure literacy strategies are consistent and effective across subjects.
- c) The School Administration must allocate time, resources, and professional development opportunities, while monitoring program outcomes. Parents and guardians can reinforce reading and comprehension practice at home through reading activities and math word problem exercises.

2. Practice Step-by-Step Translation

- a) Grade 7 Mathematics teachers should design lessons that begin with simple one-step word problems, gradually progressing to multi-step and algebraic problems.

- b) Peer tutors and high-achieving students may assist classmates by modeling translation strategies during collaborative activities or math workshops, thereby fostering peer-supported learning.

3. Teach Systematic Problem-Solving Steps

Mathematics teachers should introduce students to structured approaches such as Polya's Four-Step Method (Understand → Plan → Solve → Review). This systematic framework will guide learners in approaching word problems with clarity and confidence.

4. Teach Keyword Identification

- a) Mathematics teachers, in coordination with English teachers, should train students to identify specific words or phrases in word problems that signal the required mathematical operation.
- b) The School Curriculum Coordinator should facilitate the integration of this strategy across subjects, ensuring that keyword recognition becomes a cross-disciplinary skill.

5. Practice Under Timed Conditions.

- a) Grade 7 Mathematics Teachers implement structured practice under timed conditions to gradually enhance students' problem-solving efficiency. Initially, exercises should be administered with generous time allocations to prioritize accuracy and comprehension. Over successive sessions, the time constraints may be incrementally reduced to foster adaptability and resilience in test-taking scenarios.
- b) School Administration should monitor the implementation of this strategy, ensuring that the progression of time limits remains developmentally appropriate and does not impose undue psychological pressure. Administrative oversight will further provide support mechanisms for teachers, thereby balancing the dual objectives of improving mathematical performance and maintaining a positive learning environment.

Compliance with Ethical Standards

This study was conducted in accordance with established ethical standards in educational research. Prior to data gathering, permission was secured from the Schools Division Superintendent and the School Principal to ensure proper authorization for the conduct of the study. The respondents were informed of the purpose of the research, and their participation was treated with respect, voluntary consideration, and confidentiality. All data gathered from the Grade 7 student-respondents were used solely for academic and research purposes. The identities and personal information of the participants were kept confidential, and the results were reported in summary form to protect their privacy. The researchers ensured honesty, objectivity, and accuracy in the collection, analysis, interpretation, and presentation of data. No respondent was subjected to harm, pressure, or discrimination during the conduct of the study. Thus, the research upheld the principles of informed participation, confidentiality, integrity, and respect for the rights and welfare of all participants.

Acknowledgements

The researcher wishes to express her deepest gratitude to the special people who have extended their assistance for the success of this study. This thesis without their help is incomplete. Deep and lasting appreciation is given to:

Dr. Bethzeida Balingao, former Dean of the Graduate School. Though no longer in this institution, her support and encouragement continue to inspire me to complete this study. The researcher deeply grateful for her genuine kindness, warm heart, and unwavering belief in my capabilities. Her gentle guidance and constant affirmation gave me strength and confidence, and her legacy of kindness remains a great motivation in this endeavor.

Dr. Maricel Pascua-Ramos, Dean of the Graduate School, for her invaluable support and constant inspiration. I am truly grateful for her patience and kind consideration regarding my academic requirements. Her dedication, wisdom, and positive outlook continuously inspire me to do my best and strive for excellence in every step of this endeavor.

Dr. Mai Rani Khristine Zipagan, the researcher's adviser, for her unwavering support both emotionally and intellectually. Her constant reminders, valuable guidance, and profound wisdom kept the researcher on the right track throughout the journey. Her encouragement and understanding provided strength during difficult times, while her expertise and constructive insights greatly improved the quality of this work. Her patience and belief in the researcher's capabilities served as a great inspiration to persevere and gave the confidence needed to finish this study.

Ma'am Arcely Q. Say, the researcher's statistician, for her unceasing encouragement and invaluable assistance. I am deeply grateful for her untiring support and endless patience in refining and completing this manuscript. Her kindness, thoughtfulness, and dedication are truly admirable; she was always there to guide me, even staying up late at night to ensure everything was done right. Her commitment and warm heart made this journey lighter and more meaningful.

Dr. Salome Cariño, the researcher's editor, for her invaluable assistance, meticulous editing, and constructive suggestions throughout the preparation of this study. Her patience, expertise, and keen attention to detail greatly contributed to improving the quality, clarity, and organization of this research

Members of the panel, for constructive comments and suggestions, and for valuable recommendations which directed this study into success;

Dr. Eduardo Escorpiso Jr, the Schools Division Superintendent of The Schools Division of the City of Ilagan, for granting the writer's request to conduct this study.

The school heads, quality assurance team and respondents for their effort and help in the study.

The writer's friends in extending a helping hand and deep concern;

The researcher's family for untiring love and support;

To our Father Almighty who is the source of life and provider of knowledge, wisdom and strength that has kept the researcher to accomplish the study.

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APA Citation:

Malana, M. J. A. & Zipagan, M. R. K. A. (2026). CHALLENGES ENCOUNTERED BY THE HIGH SCHOOL STUDENTS IN SOLVING WORD PROBLEMS IN MATHEMATICS 7 AS BASIS FOR CONTEXTUALIZED LITERACY AND NUMERACY INTERVENTION PROGRAM. *Ignatian International Journal for Multidisciplinary Research*, 4(8), 911–937. <https://doi.org/10.5281/zenodo.21965973>

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