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ENHANCING MATHEMATICAL PROBLEM-SOLVING SKILLS THROUGH CUBES (CIRCLE KEY WORDS, UNDERLINE THE QUESTION, BOX THE IMPORTANT NUMBERS, EVALUATE THE PROBLEM, SOLVE THE PROBLEM AND CHECK THE ANSWER) METHOD IN GRADE 3 LEARNERS

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ABSTRACT

This action research aimed to enhance the problem-solving skills of Grade 3 learners at Sto. Niño Central Elementary School through the implementation of the CUBES (Circle key words, Underline the question, Box the important numbers, Evaluate the problem, Solve the problem, and check the answer) method. The study addressed the common difficulties students face in solving mathematical word problems by introducing a structured and visual problem-solving approach. A total of 30 learners identified as having challenges in solving word problems participated in a nine-week intervention composed of interactive, guided, and independent activities grounded in the CUBES strategy. The procedure included three phases: a pre-test to assess baseline performance, implementation of the CUBES method through focused instruction and hands-on tasks, and a post-test to evaluate learning gains. Data were analyzed using descriptive statistics and paired sample t-tests to determine the effectiveness of the intervention. Results indicated that the average problem-solving score increased from 43.56% in the pre-test to 79.56% in the post-test, indicating substantial improvement in students' performance. Moreover, a paired t-test revealed that this difference was statistically significant, $t(29) = 12.0$, $p < .001$, with a large effect size (Cohen's $d = 2.18$). Qualitative insights from student interviews revealed that the CUBES method not only enhanced comprehension and accuracy but also reduced math anxiety, increased engagement, and fostered confidence. These findings suggest that the CUBES method is an effective and learner-friendly strategy for improving mathematical problem-solving skills in the elementary level. It is recommended for wider implementation in classroom instruction, especially when paired with visual aids and structured learning activities.

KEYWORDS: *Problem-Solving, CUBES Method, Mathematics, Quantitative-Descriptive, Elementary Learners, Philippines*

INTRODUCTION

Mathematics is key to developing students' critical thinking and analytical skills. However, solving word problems remains a major challenge for young learners, as it requires interpreting information and applying appropriate operations (Haeruman et al., 2024). Vessonen et al. (2024) highlight that elementary student particularly struggle with problems requiring realistic reasoning. As Verschaffel et al. (2020) noted, success in word problems is influenced by cognitive abilities like working memory and the ability to ignore irrelevant details.

Students in Malaysia, the United States, and Indonesia face similar challenges in solving mathematical word problems, mainly due to difficulties in language comprehension and problem-solving strategies. In Malaysia, students struggle with complex sentence structures, lack systematic approaches, and often make calculation errors, affecting their confidence (Baul Ling & Mahmud, 2023). In the United States, limited reading comprehension and vocabulary hinder their ability to build accurate mental models, leading to guesswork and errors (Lariviere et al., 2025). Alfian and Hidayati (2023) found that in Indonesia, many students fail to distinguish known from unknown variables because of poor comprehension and rushed

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reading, highlighting the need for integrated reading and math instruction.

In the Philippines, students across regions face persistent difficulties in solving mathematical word problems due to gaps in both literacy and mathematical understanding. At Talalora National High School, learners struggle to comprehend problem language, extract key information, and apply strategies, resulting in frequent misinterpretations and errors (Quinto & Mabansag, 2023). At Mataas na Lupa Elementary School in Batangas, Grade 4 pupils face challenges due to weak foundational skills and difficulty identifying relevant details, leading to misused operations and incomplete solutions (Matibag et al., 2023). Luna et al. (2024) found that in Zamboanga City, Grade 4 learners at Western Mindanao State University Integrated Laboratory School struggle with poor reading comprehension, which prevents them from understanding multi-step word problems and leads to repeated errors, highlighting the need to integrate reading strategies into math instruction.

In the Division of Davao del Norte, particularly at Sto. Niño Central Elementary School, a pressing concern was noted following the analysis of the result of students' performance in their quarterly examinations in mathematics. A significant number of learners demonstrated difficulty in solving mathematical word problems, particularly in interpreting the language and context of these problems. This struggle often resulted in students failing to extract key information and apply appropriate mathematical operations, which negatively impacted the accuracy of their answers. The issue appears to be compounded by their lack of a clear problem-solving strategy and difficulty in organizing a logical approach, ultimately affecting their confidence and performance. Given the implications of these challenges on students' mathematical proficiency, conducting action research is essential. Such an initiative would aim to investigate the root causes of these difficulties and inform the development of targeted instructional strategies designed to enhance learners' word problem-solving skills and overall performance in mathematics.

The focus of this study emerged from the observable difficulties that students face in solving mathematical word problems, which have been identified as a significant barrier to their academic success. As a future educator, it is imperative to address this challenge and enhance students' ability to comprehend and solve mathematical word problems. This study has significant implications for educational practices as it seeks to identify strategies to improve students' word problem-solving skills, ultimately contributing to their overall mathematical proficiency. By understanding the specific difficulties students encounter in comprehending and solving word problems, educators can develop targeted interventions to support their learning and foster a deeper understanding of mathematical concepts.

International studies have explored various aspects of mathematical word-problem solving. Rohini et al. (2022) focused on solving single-operation word problems using deep learning. Witzel et al. (2021) examined five strategies for students with learning disabilities. Myers et al. (2022) analyzed interventions for elementary students with math difficulties. However, these studies do not address the specific needs of Grade 3 learners in developing strategies for interpreting and solving word problems. The present study fills this gap by focusing on the challenges faced by Filipino Grade 3 students and proposing targeted interventions to strengthen their problem-solving skills.

RESEARCH QUESTIONS/OBJECTIVES

The research questions below aimed to investigate the effectiveness of the CUBES method in addressing mathematical problem-solving challenges among Grade 3 learners at Sto. Niño Central Elementary School. This study sought to enhance students' understanding and skills in solving mathematical word problems through the CUBES intervention. Specifically, this study sought to answer the following questions:

1. What is the level of students' mathematical problem-solving skills before the implementation of the CUBES method in Grade 3 learners?
2. What is the level of students' mathematical problem-solving skills after the implementation of the CUBES method in Grade 3 learners?
3. Is there a significant impact of the CUBES method in improving the mathematical problem-solving skills of Grade 3 learners?
4. What are the insights of grade 3 students from the implementation of the CUBES method regarding its effectiveness in enhancing their problem-solving abilities?

Proposed Intervention

The proposed intervention, known as the CUBES method, is a 3-week strategy designed to systematically improve students' mathematical problem-solving skills. It progresses through three key phases—direct instruction, guided practice, and independent application—each building on the previous to strengthen foundational skills and promote mastery in solving mathematical word problems.

In the first week, the researchers began by securing approval from the school principal and administering a pre-test to assess the initial problem-solving abilities of the Grade 3 learners. The pre-test focused on identifying students' difficulties in understanding and solving mathematical word problems. Following this, the CUBES strategy was introduced through direct instruction. Teachers explained and modeled each step of the method (Circle key words, Underline the question, Box important numbers, Evaluate the problem, Solve it, and Check the answer) to build students' familiarity and foundational understanding of the process.

During the second week, the focus shifted to guided practice and collaborative learning. Students solved word problems with the structured support of their teacher, applying each step of the CUBES method. Group activities and interactive problem-solving tasks encouraged peer discussions, helping learners clarify concepts and strategies together. Throughout the week, formative assessments and teacher feedback were used to

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monitor students' progress, address misconceptions, and provide immediate reinforcement where needed.

In the final week, students applied the CUBES strategy independently through varied problem-solving exercises designed to strengthen their confidence and mastery of the method. Reinforcement activities, such as hands-on tasks and review sessions, allowed learners to practice applying the strategy across different types of word problems. At the end of the week, a post-test was administered to measure improvements in problem-solving skills. The results were compared with the pre-test data to evaluate the effectiveness of the CUBES intervention in enhancing mathematical comprehension and performance.

Week	Activity	Description	Assessment
Week 1	The intervention begins with the administration of a pre-test to assess students' initial problem-solving skills, followed by the introduction of the CUBES method to familiarize them with its steps and purpose.	Administer pre-test. Explain and model each CUBES step (Circle, Underline, Box, Evaluate, Solve, Check).	Pre-test results to identify gaps.
Week 2	The next phase involves guided practice, where students apply the CUBES method with teacher support, combined with collaborative activities that encourage peer interaction and shared problem-solving.	Provide guided practice using sample word problems. Facilitate group discussions and interactive tasks.	Formative assessment + feedback.
Week 3	The final phase focuses on independent application of the CUBES method, where students solve word problems on their own, supported by reinforcement activities to strengthen their problem-solving skills and confidence.	Let students independently solve problems using CUBES. Conduct hands-on and review exercises.	Post-test + analysis of improvement.

RESEARCH METHODOLOGY

Research Design

This study employed quantitative research through a one-group pretest-posttest design, a type of pre- experimental approach. This design involves assessing a single group of participants at two distinct points: before (pretest) and after (posttest) the implementation of an intervention. It assessed changes resulting from an intervention or project by comparing values before (baseline) and after the intervention (end-line evaluation). Unlike experimental designs, pre- experimental designs lack a control group for comparison; instead, they focus on changes within a single group over time. The observed differences between baseline and end-line values are attributed to the project, suggesting its impact on the outcomes (Wamunyima & Nyirenda, 2023).

This methodological approach is particularly suitable for this action research, which aims to evaluate the effectiveness of the " CUBES (Circle key words, Underline the question, Box the important numbers, Evaluate the problem, Solve the problem and check the answer) " intervention in enhancing student mathematical problem-solving skills among grade 3 students. The intervention involves implementing game-based learning activities aimed at promoting student participation and interest in various educational activities.

Research Participants

The participants in this study are the Grade 3 learners from Sto. Niño Central Elementary School who demonstrated challenges in mathematical problem-solving skills, specifically in understanding and solving word problems. A total of 30 students were purposively selected based on their initial pre-test scores, indicating areas of difficulty in word problem comprehension and execution. This study focused on 8-9-year-old students who were at a critical stage in building foundational math skills essential for their future academic progress. The CUBES method was implemented as an intervention to help these learners break down complex word problems into manageable steps, enhancing their problem-solving skills. By the end of the study, students were expected to demonstrate improved abilities in analyzing, interpreting, and solving mathematical word problems with confidence, supported by the structured steps of the CUBES approach.

Data Analysis

In analyzing the data, the researchers tabulated the raw scores of the students from both the pre-test and post-test. Afterwards, the overall mean was calculated to reveal the level of students' problem-solving skills before and after the implementation of the intervention.

In addition to the quantitative data, qualitative insights were gathered through in-depth interviews to explore students'

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perceptions and experiences. The interview responses underwent a rigorous qualitative analysis process. This included coding the transcripts to identify recurring patterns, reducing the data to focus on the most relevant information, and applying thematic analysis to extract meaningful themes. This approach allowed the researchers to gain a deeper understanding of the intervention's effectiveness, the perceived benefits from the learners' perspectives, and their suggestions for further improvement. The integration of both quantitative and qualitative analyses provided a comprehensive view of the CUBES intervention's overall impact.

Research Instrument

This study utilized a questionnaire adapted from an online source to assess mathematical word problem skills, derived from Desikan (2024). The Kuder-Richardson (KR-20) reliability scores for the test were 0.71 for addition, 0.73 for subtraction, and 0.79 for multiplication/division. However, this study only analyzed the pre-test and post-test results of respondents on mathematical word problems. The test comprised 10 questions, split into two sections: (I) Addition and subtraction, and (II) Multiplication and division. Each correct answer was awarded 1 point, for a total of 10 points.

Table 1
Range of Percentage Score

Range of Percentage Score	Descriptive Level	Interpretation
91-100	Very High	If the measures described in solving mathematical word problem skills of the student is outstanding.
76-90	High	If the measures described in solving mathematical word problem skills of the student is very satisfactory.
61-75	Average	If the measures described in solving mathematical word problem skills of the student is satisfactory.
51-60	Low	If the measures described in solving mathematical word problem skills of the student is fairly satisfactory
0-50	Very Low	If the measures described in solving mathematical word problem skills of the students did not meet the expectation.

Procedure

The researchers employed a comprehensive assessment approach to evaluate the effectiveness of the CUBES intervention in enhancing the mathematical problem-solving skills of Grade 3 learners. A pre-test was administered to assess the learners' initial problem-solving abilities, with a particular focus on their comprehension and application of mathematical word problems.

Following the pre-test, the researchers systematically implemented the CUBES method through a structured instructional intervention. This process involved explicit teaching, guided practice, and independent application of the strategy. The intervention sessions began with direct instruction, where educators thoroughly explained each step of the CUBES method: First, they Circle the key words to identify important terms that give context to the problem. Next, they Underline the question to ensure they understand what is being asked. Then, they Box the important numbers, focusing on relevant values needed for calculations. After identifying these details, students Evaluate the problem by determining the appropriate operations or steps to solve it. They then Solve the problem carefully, applying the correct mathematical procedures. Finally, they Check their answer to verify its accuracy and ensure it makes sense within the context of the problem.

To reinforce learning, students engaged in interactive problem-solving activities, collaborative discussions, and hands-on exercises that allowed them to apply the CUBES method to various mathematical word problems. Formative assessments and teacher feedback were incorporated throughout the intervention to monitor progress and provide necessary support.

After the intervention, a post-test was administered to determine the extent of improvement in the learners' problem-solving skills. The comparison between pre-test and post-test results provided valuable insights into the effectiveness of the CUBES strategy in enhancing students' mathematical comprehension and problem-solving abilities.

To gather necessary data, the researchers followed these steps: First, they requested approval from the principal of Sto. Niño Central Elementary School to conduct the study with Grade 3 participants. Next, they administered the pre-test to establish baseline data on the students' difficulties with mathematical word problems. The CUBES intervention was then implemented over a period of nine weeks, during which students practiced problem-solving with the structured support of the CUBES method in their regular math lessons. At the end of the intervention period, a post-test was conducted using similar types of word problems to assess any improvements in the learners' problem-solving skills. The data collected from both the pre-test and post-test were then tabulated and analyzed to evaluate the impact of the CUBES method on students' mathematical problem- solving abilities.

Ethical Consideration

Adhering to ethical standards is vital for maintaining the integrity and reliability of research outcomes, ensuring that the study aligns with the principles of knowledge, truth, and the avoidance of error. By upholding ethical practices, this research also fosters values that are fundamental to collaborative work, including trust, accountability, mutual respect, and fairness. To

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meet these ethical obligations, this study strictly adhered to the ethical principles outlined in the Belmont Report (2010). These principles include respect for autonomy, beneficence, non-maleficence, justice, informed consent, confidentiality, and data protection.

Participants were provided with comprehensive information about the study's purpose, procedures, and potential risks, allowing them to make an informed choice regarding their involvement. Measures were also taken to protect participants' privacy, with all data handled securely to maintain confidentiality. Additionally, the researchers ensured that their conduct remained transparent and free from conflicts of interest, safeguarding the integrity and impartiality of the study's findings. This ethical foundation was crucial for building trust and ensuring that the research responsibly addressed the educational needs of its participants.

RESULTS AND DISCUSSIONS

Presented in this chapter are the results or data obtained in the study. The chapter presents the data on the level of performance in mathematical problem-solving among students in pre-test; the level of performance in mathematical problem-solving among students in post-test; and significant difference of the pretest and post-test scores of the students.

Research Objective No.1: What is the level of students' mathematical problem-solving skills before the implementation of the CUBES method in Grade 3 learners?
Table 2 shows the pre-test data on the problem-solving skills of Grade 3 learners, with 30 participants involved in the implementation of the CUBES Method. The results revealed an average percentage score of 43.56% with a standard deviation of 2.10, indicating very low performance by the pupils in the pre-test. The highest score achieved was 9, attained by 6 students, representing 20.0% of the group, while the lowest score was 2, recorded by 1 student, accounting for 3.3% of the group. The most frequent scores were 8 and 9, each with a frequency of 6, making up 20.0% of the group.

Table 2
Frequency of the Scores in Pre-Test

Scores	Frequency	Percentage
2	1	3.3%
3	3	10.0%
4	2	6.7%
5	2	6.7%
6	5	16.7%
7	5	16.7%
8	6	20.0%
9	6	20.0%
Overall Mean		**6.53**
Average Percentage Score (%)		**43.56 %**
Standard Deviation		**2.10**
Description		**Very Low**

This result was supported by the study of Wan et al. (2023), it found that pupils struggled with word problems due to limited reading comprehension and weak conceptual understanding, often focusing on keywords rather than the full context, which led to errors. They noted that the CUBES strategy improved understanding and accuracy through its structured, step-by-step approach. Similarly, Wan and Abdullah (2023) reported that word problems are a major challenge, with difficulties linked to numerical and linguistic complexity, and identified five common issues: understanding language, imagining context, forming number sentences, performing calculations, and interpreting answers. Kusumadewi and Retnawati (2020) highlighted that student often failed to comprehend problems, choose strategies, and solve correctly due to weak conceptual foundations and lack of guided practice. Moreover, Maghfiroh and Wahyuningsih (2024) also found low student performance in conceptual understanding, operational skills, and problem-solving, stressing the need for structured interventions to build higher-order thinking.

Research Objective No.2: What is the level of students' mathematical problem-solving skills after the implementation of the CUBES method in Grade 3 learners?
Table 3 shows the post-test results on the problem-solving skills of Grade 4 learners, with 30 students participating in the implementation of the CUBES Method. The results revealed an average percentage score of 79.56% with a standard deviation of 1.11, indicating a high level of performance by the pupils in the post-test. The highest score achieved was 14, attained by 2 students, accounting for 6.7% of the group, while the lowest score was 10, recorded by 3 students, representing 10.0% of the group. The most frequent score was 12, with a frequency of 9, making up 30.0% of the group.

Table 3
Frequency of the Scores in Pre-Test

Score	Frequency	Percentage
10	3	10.0%
11	8	26.7%
12	9	30.0%
13	8	26.7%
14	2	6.7%
Overall Mean		**11.93**
Average Percentage Score (%)		**79.56%**
Standard Deviation		**1.11**
Description		**High**

Previous and recent research supports the effectiveness of structured strategies in improving mathematical problem-solving. For instance, Cahyani et al. (2021) investigated the Relating Experiencing-Applying-Cooperating-Transferring (REACT) strategy combined with graphic organizers and found a significant increase in students' problem-solving scores from 29.1 to 69.5 across three cycles. The sequential nature of REACT closely mirrors the step-by-step structure of the CUBES method highlighting the effectiveness of guided approaches. Similarly, Permatasari et al. (2020) found that students taught using Problem-Based Learning (PBL) tools showed greater improvement inproblem-solving abilities compared to those taught using conventional methods. The PBL model's emphasis on identifying and analyzing problems supports the structured guidance provided by CUBES. Additionally, Chalermsri and Poonpaiboonpipat (2024) utilized a classroom action research method with open-ended strategies and observed improvements in students' mathematical thinking

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habits and problem-solving skills. Their findings further align with the CUBES approach, reinforcing the value of structured interventions in enhancing students' mathematical understanding and performance.

Research Objective No.3: Is there a significant impact of the CUBE Method intervention on improving the mathematical problem-solving skills of Grade 3 learners?

To determine whether this difference was statistically significant, a t-test for dependent samples was conducted, $t(29)=12.0$, $p<.001$. Since the p-value is well below the significance level of 0.05, the null hypothesis stating that there is a significant difference between the pre-test and post-test scores is rejected. The computed Cohen's d was 2.18, which indicates an extremely large effect size. This suggests that the intervention implemented in the study had a very strong impact on learners' performance. This result highlights the effectiveness of the CUBE method intervention and its potential to significantly enhance the mathematical problem-solving skills of the learners.

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Table 4
Significant Difference between Pre-test and Post-test Scores

Type of Test	*N*	*df*	*Mean*	Mean difference	*SD*	*t-value*	*P-value*	*Cohen's d*	*Decision a=0.05*
Pre-Test	30	29.0	43.56	5.40	2.10	12.0	<.001	2.18	Significant
Post-Test	30		79.56		1.11				

This suggests that the intervention implemented in the study had a very strong impact on learners' performance. This result highlights the effectiveness of the CUBE method intervention and its potential to significantly enhance the mathematical problem-solving skills of the learners.

This result is supported by the study of Pan and Ke (2023), which highlights the substantial benefits of incorporating game-based learning into mathematics education. Their research shows that students engaged with mathematical content through interactive, game-oriented platforms demonstrated significantly greater improvement in analyzing and solving problems compared to those taught through traditional, procedural methods. Game-based environments promote active participation critical thinking, and real-life application, enhancing both understanding and retention.

Moreover, Porwokerto et al. (2023) assert that game-based learning fosters critical thinking by encouraging students to explore problems from different perspectives, strengthen reasoning, and develop strategies. It reduces anxiety, supports diverse learning styles, promotes collaboration, and provides immediate feedback to help students refine their approaches.

Additionally, Nahdi et al. (2023) emphasize the importance of interest in mathematics, reading comprehension, and affective attributes like motivation and attitude in developing problem-solving abilities. Their findings reveal that students with strong literacy skills and positive dispositions toward math are more capable of interpreting and solving word-based problems, underlining the need for holistic approaches that integrate cognitive and emotional factors in mathematical instruction.

Furthermore, Sinaga et al. (2023) emphasize that solving word problems depends on students' deep understanding of each step, including interpreting the context, identifying key information, and applying concepts. This comprehension boosts achievement, confidence, and enthusiasm, making it essential to nurture students' problem-solving abilities.

Research Objective No.4: What are the insights of grade 3 students from the implementation of the CUBES method regarding its effectiveness in enhancing their problem-solving abilities?

To answer this research question, in-depth interviews were conducted with the participants. Probing questions were asked to elicit their responses regarding their observation and experiences with the impact of the CUBES method in improving spelling proficiency among grade 3 students. The major themes and sample statements for research question number 4 are presented in Table 5. Participants shared their responses about their own experiences and observation of the intervention. From the answers of the participants, five major themes emerged: (1) enhanced comprehension and clarity in solving word problem, (2) motivational tool in learning math, (3) off-campus application of strategy, (4) confidence-building framework, (5) visual reinforcements and memory aids.

The implementation of the CUBES method revealed several valuable insights into its effectiveness in improving the problem-solving abilities of Grade 3 learners, particularly in enhancing their comprehension and clarity when tackling word problems. Learners shared that the method gave them a clear starting point and enabled them to easily identify relevant information, which contributed to better understanding and performance. This observation supports the findings of Nguyen et al. (2021), who reported that structured problem-solving strategies significantly boost comprehension and mathematical performance among elementary students. Additionally, the CUBES method served as a motivational tool, encouraging students to engage more confidently with math tasks. This is further supported by Andrade et al. (2022), who noted that structured problem-solving frameworks not only enhance mathematical understanding but also help reduce cognitive overload, making learning more accessible and less intimidating for young learners.

Students described the CUBES process as fun and engaging, often comparing it to a game, which made learning math more

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enjoyable and less intimidating. This perception aligns with the findings of Fernandez and Delgado (2020), who emphasized that incorporating structured and interactive methods in math instruction enhances student motivation and engagement. Similarly, Kim and Hannafin (2021) found that guided instructional strategies that promote active involvement significantly boost students' interest and enthusiasm in mathematics. These insights suggest that beyond improving comprehension, the CUBES method fosters a positive learning environment that encourages active

Table 5
Insights of grade 3 students from the implementation of the CUBES method regarding its effectiveness in enhancing their problem-solving abilities

EMERGING THEMES	SAMPLE STATEMENTS
Enhanced Comprehension and Clarity in Solving Word Problem	✓ "CUBES helped me because now I clearly know how to start solving, teacher. It is also easier for me to understand math problems." - IDI-01 ✓ "Before, I did not understand why solving word problems was important. But after learning CUBES, I realized I can get the correct answer if I follow the steps. Now, I like word problems and I'm not afraid anymore." - IDI-03 ✓ "CUBES helped me because now I know where to start. I am not confused about what to do first." - IDI-04 ✓ "Before, I do not understand word problems. But now it is clearer what I need to look for in the problem." - IDI-05 ✓ "I was taught to read the problem again and understand it well. Now I can solve it more easily." - IDI-06
Motivational Tool in Learning Math	✓ "CUBES is fun, like a game. It feels like looking for clues. I enjoy trying many problems because I like circling and underlining. I like learning math now because it is fun." - IDI-02 ✓ "I enjoy math more now because I know what to do. I am not afraid anymore when there's a word problem." - IDI-04 ✓ "I like joining class now because the CUBES steps are easy to understand. It is like a game, but you learn something." - IDI-05 ✓ "I am more active now because I want to try CUBES every class. Sometimes, I even solve problems ahead of time." - IDI-06 ✓ "I enjoy math more since we started using CUBES. Word problems are not boring anymore because we have steps to follow. I like joining class and trying my best to answer." - IDI-07
Off-campus Application of Strategy	✓ "Even if we do not use CUBES in class, I still remember the steps that you taught. I look at the numbers and the question first. It helps me at home or during quizzes." - IDI-02 ✓ "I do not just guess answers anymore when I see word problems. I think about CUBES and ask myself, 'What am I looking for?' and 'What do the numbers mean?' It really helps even with my homework or helping my little brother." - IDI-03 ✓ "When I review at home, I underline the numbers and instructions, just like we do in class." - IDI-05 ✓ "During exams, I apply CUBES so I do not get confused. It really helps me understand the problem." - IDI-06 ✓ "I still use CUBES at home or during exams. First, I circle the numbers, then underline the question. I have learned that it is important to understand everything first." - IDI-07
Confidence-building Framework	✓ "I am not scared to answer word problems anymore, teacher. Before, I do not like answering because I did not understand. Now, I just look at my guide and follow the steps to solve." - IDI-01 ✓ "Before, I was scared when word problems were long. But CUBES taught me to break them into parts. Now, I can face problems bravely because I know what to do. It helped me believe in myself." - IDI-02 ✓ "Now, I follow the steps and sometimes solve problems by myself. I am not afraid anymore and I believe in myself more." - IDI-03 ✓ "I do not cry anymore when problems are hard to understand. I feel more confident because I have CUBES as my guide." - IDI-04 ✓ "I'm not scared to recite anymore." - IDI-05 ✓ "Before, I always got it wrong. But now I mostly get it right. I am prouder of myself." - IDI-06
Visual Reinforcements and Memory Aids	✓ "Maybe we can make CUBES posters so we can always see them on the wall." - IDI-01 ✓ "It would also be nice to have a poster in the classroom showing what each CUBES step means." - IDI-02

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	✓ "Use different colors for each CUBES step so we could also watch videos or sing songs about CUBES." - IDI-03 ✓ "Maybe we could put pictures or posters on the wall to help us remember the steps." - IDI-04 ✓ "Make a wall chart showing the CUBES steps so we can easily remember them." - IDI-07

participation and sustained motivation among learners.
Additionally, students demonstrated the off-campus application of the CUBES strategy, with many reporting its use at home, during exams, and when assisting peers, indicating a strong internalization of the method. This observation is consistent with the findings of Habibi and Abdullah (2022), who noted that students who internalize problem-solving strategies are more likely to transfer and apply them in various settings beyond the classroom. Similarly, Lee and Huang (2020) found that self-directed learners who consistently employ structured strategies like CUBES are better equipped to apply these skills independently across multiple academic contexts. These findings highlight the method's effectiveness not only within formal instruction but also in promoting autonomous and practical use of problem-solving skills.

The CUBES method also functioned as a confidence-building framework, with students reporting decreased fear and anxiety when approaching math tasks, as the structured steps provided clarity and a sense of control. This aligns with Liew et al. (2020), who emphasized that structured learning approaches enhance learners' confidence and self-efficacy by offering predictable, manageable steps that support independent problem-solving. Likewise, Akpan and Beard (2021) found that using clear and repeatable strategies significantly reduces math anxiety and encourages more students to participate confidently in solving problems. These findings underscore CUBES' role not only in skill development but also in fostering a more positive emotional response to mathematics.

Lastly, the significance of visual reinforcements and memory aids emerged as a key theme, with students suggesting the use of posters, wall charts, and songs to help reinforce each step of the CUBES method. This aligns with Chai and Lim (2021), who highlighted the effectiveness of visual and multimodal supports in boosting memory retention and procedural understanding among young learners. Similarly, Torres and Santos (2023) found that visual tools such as charts and diagrams are instrumental in helping students retain and recall problem-solving strategies over time. These insights underscore the value of incorporating visual and auditory aids to support long-term mastery of structured methods like CUBES.

CONCLUSION

The findings of this study revealed that the Grade 3 learners at Sto. Niño Central Elementary School initially exhibited considerable difficulty in solving mathematical word problems. This was clearly reflected in their pre-test results, where the average score was only 43.56%, categorized as "Very Low." This indicated that many learners struggled to identify key information, understand the problem context, and apply the correct mathematical operations. The low performance underscored the urgent need for an intervention that could offer a structured, student-friendly approach to mathematical problem-solving.

Following the implementation of the CUBES Strategy Circle key words, Underline the question, Box the important numbers, Evaluate the problem, and Solve and check the answer students demonstrated a substantial improvement in their problem-solving abilities. The post-test results showed an average score of 79.56%, categorized as "High," representing a significant increase in learners' ability to comprehend, analyze, and solve word problems. This improvement was not only statistically significant ($p < .001$) but also had a large effect size (Cohen's $d = 2.18$), confirming the effectiveness of the CUBES method in fostering deeper understanding and more accurate application of problem-solving steps.

The quantitative difference between the pre-test and post-test scores was both substantial and meaningful. The learners' average scores nearly doubled, and there was a marked reduction in the variability of scores, indicating that the intervention benefited a broad range of students including those who initially struggled. These results strongly suggest that the step-by-step, visual, and guided nature of the CUBES strategy enabled learners to approach mathematical problems with greater confidence, accuracy, and consistency.

In addition to the numerical data, qualitative insights from learner interviews revealed that students found the CUBES method to be helpful, engaging, and motivational. Learners expressed that the strategy clarified their understanding, reduced their fear of word problems, and built their confidence in mathematics. They appreciated the game-like format and visual reinforcements, which made learning math more enjoyable and accessible. These findings affirm that a well-structured and learner-centered intervention like the CUBES method not only boosts academic performance but also fosters positive attitudes and greater engagement in learning mathematics.

RECOMMENDATION

Based on the study's findings, several recommendations emerge. First, it is recommended that the CUBES method be implemented across other grade levels and schools, particularly where learners exhibit low proficiency in solving mathematical word problems. Its structured format provides the scaffolding that many young learners need.

Second, incorporating more interactive and gamified components such as team challenges, math games, puzzles, and visual aids can further increase students' enthusiasm and improve retention of problem-solving strategies, especially for visual and kinesthetic learners.

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Third, to strengthen the impact of the CUBES strategy beyond the classroom, it is recommended to involve parents by providing them with simple guides or training sessions on how to support their children at home. Sending home sample word problems and encouraging the use of the CUBES steps during homework can reinforce consistency in strategy application and foster a supportive learning environment within the family. This collaboration can help sustain learners' progress and build their confidence in applying math skills independently.

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