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ENHANCING PROBLEM-SOLVING SKILLS IN SIMPLE INTEREST AMONG GRADE 7 STUDENTS THROUGH THE INTER (IDENTIFY, NOTE, TRACK, EVALUATE, REVIEW) STRATEGY

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ABSTRACT
This study examined the effectiveness of the INTER intervention in enhancing problem-solving skills in simple interest among Grade 7 learners. The INTER, a method used to improve problem-solving skills in simple interest, was implemented to address notable problem-solving difficulties observed among the students. The research objectives were to determine the level of problem-solving skills in simple interest among Grade 7 learners before and after implementing the INTER and to explore the impact of this intervention on their problem-solving skills. Prior to the intervention, students recorded an overall mean score of 36.44% in the pretest, indicating needs improvement in problem-solving involving simple interest. After implementing the intervention, the posttest results showed a significant improvement, with an overall mean score of 82.8%, suggesting a highly effective impact of INTER strategy on students' learning outcomes. The data, as presented in the results table, reflect a marked difference in the performance of fifty-eight (58) students in problem-solving involving simple interest. This notable improvement demonstrates the effectiveness of the intervention in helping students build knowledge and understanding problem-solving more confidently. Initially, students struggled with these topics, showing limited understanding and skills. However, following the structured and supportive learning process offered by the INTER strategy, their performance improved considerably. These findings highlight the value of targeted instructional strategies in addressing specific learning gaps among students. Moreover, results showed that students performed better in the post-test than the pre-test, implying a significant difference between the two test scores, $t(57) = 11.9$, $p<.001$, with a standardized effect size of Cohen's $d = 1.57$. Since the probability value ($p<.001$) is less than the level of significance ($a = 0.05$), the null hypothesis is rejected. The rejection is supported by having a standard deviation of 14.64 in pretest and 5.66 in post-test, indicating the reliability of the mean. This means that there is a significant difference between the pretest and post-test scores. In the qualitative phase, the researchers gained insights about the positive outcome of the intervention together with the challenges faced by the learners. The study concludes that scaffolding methods like INTER can significantly contribute to developing Grade 7 students' problem-solving skills, making the complex topics more accessible and enhancing their problem-solving skills involving simple interest in real-life situations.

KEYWORDS: *INTER, Intervention, Problem-Solving Skills, Simple Interest, Scaffolded, Philippines*

INTRODUCTION
Connecting various mathematical concepts is essential for students to excel in solving simple interest problems. These connections are like assembling puzzle pieces, involving facts (such as principal, rate,
and time), formulas (like I=P×R×T), and problem-solving skills. When students can effectively link these elements, they are more likely to calculate simple interest accurately and confidently. However, difficulties in understanding the relationships between these components or errors in applying them can make solving simple interest problems more challenging. In essence, students who master integrating these mathematical ideas tend to perform better in solving financial-related problems (Pambudi et al., 2020).

Understanding and solving simple interest problems continues to pose challenges for students in various educational contexts. Research indicates that learners often struggle with comprehending the fundamental concepts and applying formulas correctly in financial mathematics. There is an introduced a mobile augmented reality tool to assist students in learning simple interest and found that many students initially faced difficulties such as confusing simple and compound interest, misinterpreting terms like principal and interest rate,

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and errors in time unit conversions. Their study highlighted that about 70% of students committed at least one of these errors, demonstrating widespread conceptual misunderstandings (Moreno et al., 2021)

Low problem-solving skills in simple interest computation continue to be a significant obstacle for many students, adversely affecting their overall success in mathematics and their financial literacy. Many learners find it difficult to comprehend and effectively apply the necessary problem-solving steps, leading to subpar performance in mathematical areas that include financial topics such as simple interest. It is revealed that only around 25% of students were able to fully grasp how to plan and carry out problem-solving strategies, indicating a notable deficiency in problem-solving competence (Gunawan et al., 2023).

In Mexico, a study analyzing college students' competence in calculating simple and compound interest revealed significant challenges in financial mathematics proficiency. Despite the fundamental nature of the simple interest formula, I=P×R×T, many students demonstrated difficulty not only in performing the calculations but also in understanding their practical applications. The research found that a considerable portion of Mexican university students struggled with these concepts, reflecting gaps in both conceptual understanding and computational skills. These difficulties are linked to traditional teaching methods that emphasize procedural memorization over deep conceptual learning and problem-solving. Furthermore, limited instructional time and insufficient emphasis on real-world applications contribute to students' low proficiency in simple interest calculations, underscoring a broader issue in financial literacy education within Mexico's higher education system (Moreno-García, 2024).

In Ethiopia, it is revealed that undergraduate students faced significant difficulties in both posing and solving simple interest problems, highlighting limited conceptual understanding and problem-solving skills in financial mathematics. The study emphasized that students struggled to apply the simple interest formula effectively and to create complex problems, indicating gaps in both comprehension and application (Geteregechi 2022).

Similarly, in Turkey it is investigated that elementary students' problem-solving performance across different problem types, including verbal and diagram-supported story problems related to mathematical concepts such as simple interest. The findings showed that students solved equation-based problems more accurately than verbal or story problems, suggesting challenges in translating real-world contexts into mathematical representations. This difficulty affects their ability to solve practical financial problems involving simple interest (Çilingir, 2022).

In the Philippines, low mathematics proficiency remains a persistent issue among Filipino students, as evidenced by the results of the Programme for International Student Assessment (PISA) 2022. Filipino students continue to rank among the least proficient globally in mathematics, with an average score of 355 points—far below the OECD average. The study highlights that students struggle not only with general mathematical concepts but also with applying these concepts to real-world situations, such as solving problems involving simple interest. This difficulty is attributed to traditional teaching methods that emphasize rote memorization of formulas, like those used in simple interest calculations, rather than fostering deeper understanding and problem-solving skills. The authors emphasize that these challenges are compounded by limited resources and insufficient instructional support, underscoring the urgent need for educational reforms to improve mathematics proficiency and practical financial literacy in the Philippines (Acido & Caballes, 2024).

In Palawan, students' difficulties in solving mathematical problems, including those involving simple interest, remain a significant challenge. Preservice teachers in Palawan revealed low to fair performance in solving word problems, particularly those requiring the application of mathematical concepts such as simple interest. These difficulties to poor content knowledge, limited problem-solving skills, and challenges in interpreting problem contexts, which hindered students' ability to recall and apply relevant formulas accurately (Pentang et al., 2024).

Similarly, in Mindanao, students continue to face challenges in solving simple interest problems, which affects their overall mathematical problem-solving skills. Senior high school students in a university in Mindanao revealed that traditional procedural teaching methods contributed to students' difficulties in understanding and applying the simple interest formula (Apasen Ngiwas et al., 2020).

In Davao del Norte, particularly at Kapalong National High School, recent academic performance records and classroom assessments revealed that a large portion of Grade 10 students are struggling in mathematics, as reflected in their consistently low exam scores and final grades. Notably, around 70% of these students exhibit difficulty in solving fundamental problems involving simple interest, specifically in applying the formula $I = P \times R \times T$ in practical situations like computing interest on savings or loans. This lack of mastery has become a significant concern, as it not only affects their overall academic achievement in mathematics but also undermines their confidence and motivation to engage in the subject. These findings have prompted the school to explore the underlying factors contributing to these difficulties in order to implement targeted interventions aimed at improving students' mathematical understanding and problem-solving skills in real-life contexts.

This study is relevant because it explores the connection between how students learn and their ability to solve real-world problems, particularly simple interest problems among Grade 10 students. Problem-solving skills, such as calculating interest on loans or savings using the formula I=P×R×T, are essential in both business and daily life. However, Filipino students' performance in mathematics remains a concern, as evidenced by their below-minimum proficiency levels in the PISA assessment. This gap highlights that many students lack the

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necessary skills to solve practical mathematical problems, placing them significantly behind their peers globally.

While research has increasingly focused on factors influencing students' mathematics achievement and problem-solving skills, a clear gap remains in understanding how self-regulated learning and teacher autonomy support specifically affect students' abilities to solve problems involving simple interest in financial mathematics. For example, Moreno et al. (2021), in their study titled *"Investigating the Impact of Mobile Augmented Reality (AR) on Students' Computation of Simple Interest in a Financial Mathematics Course"*, demonstrated the potential of technology-enhanced learning tools to improve conceptual understanding. Similarly, Alias et al. (2023), in their study titled *"Exploring the Relationship Between Mathematics Anxiety, Attitudes Toward Mathematics, and Problem-Solving Skills Among Primary Pupils in Kedah"*, highlighted the importance of affective factors in mathematical performance. However, these studies primarily address technological interventions and psychological factors, rather than examining the role of self-regulated learning strategies or the influence of teacher autonomy support in mathematics instruction. Although Ciftci and Karadag (2020), in their study titled *"Examining the Relationship Between Self-Regulated Learning Skills and Mathematics Achievement"*, explored self-regulated learning, their work did not focus on the context of simple interest or consider the combined effect of teacher autonomy support. Thus, there is a noticeable gap in the literature regarding how self-regulated learning and teacher autonomy support interact to influence students' problem-solving skills specifically in the domain of simple interest computation.

Finally, this study will contribute valuable information not just within the institution but also to a wider audience, including its findings, will be disseminated to the various research conferences and related agencies to facilitate scholarly exchange and utilization of research-based discovery. By doing this, the significance and findings of this study would be recognized by the broader community through making actions and solutions on the problems being discussed as well as the recommendations being suggested here.

Research Questions

The research questions below investigated reasons on how to address and enhace problem-solving skills in simple interest among grade 7 students through the inter (identify, note, track, evaluate, review) strategy. The research questions that guided this study are the following:

1. What is the pretest result on the level of problem-solving skills in simple interest of the experimental group?
2. What is the post-test result on the level of problem-solving skills in simple interest of the experimental group?
3. Is there a significant difference between the pre-test and post-test scores of the experimental group?
4. What are the students' insights into implementing the INTER (Identify, Note, Track, Evaluate, Review) intervention?

Proposed Intervention

The INTER strategy (Identify, Note, Track, Evaluate, and Review—was used to help Grade 7 students improve their problem-solving skills, especially with simple interest problems in math. This step-by-step method made it easier for students to understand concepts, connect ideas, and enjoy learning math. It also encouraged teamwork and matched the students' learning level.

The strategy was applied during the National Mathematics Program (NMP) for four weeks, from February 17 to March 7, with daily sessions from 10:20–11:10 AM. In total, there were six sessions, including the pre- and post-tests.

Week 1: Orientation and Pre-Test

The teacher explained the study and gave a pre-test to check the students' knowledge and feelings about math. Materials: pre-test papers, pens, and charts.

Week 2: Learning the INTER Strategy

Students learned how to use the INTER steps through simple practice problems. Materials: worksheets, calculators, and guides.

Week 3: Solving Real-Life Problems

Students solved real-life problems related to money and interest in pairs or groups. Materials: activity sheets and calculators.

Week 4: Group Activity

Students created and solved each other's simple interest problems using stories. Materials: manila paper, markers, and calculators.

Week 5: Review and Reflection

Students reviewed the lessons, played games, and wrote reflections. Materials: review sheets, flashcards, and reflection papers.

Week 6: Post-Test and Feedback

Students took a post-test and gave feedback. The teacher checked the results to see the strategy's impact. Materials: post-test papers and feedback forms.

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Table 1. Matrix of the INTER (Identify, Note, Track, Evaluate, and Review) Intervention

Session	Title	Activity Description	Method	Objective	Materials
1	Orientation and Pre-Test	Orientation about the study; explanation of steps and purpose; students take a pre-test.	Orientation, Pre-assessment	To inform students about the study and check their current skills and attitude in math.	Pre-test papers, pens, charts, visual aids
2	Practicing INTER Strategy	Students learn and practice solving problems using the INTER strategy.	Guided practice	To help students understand and get used to using the INTER strategy.	Worksheets, calculators, printed INTER strategy guides
3	Real-Life Problem Solving	Students solve simple interest problems from real-life situations using INTER strategy.	Problem-based learning	To apply their knowledge to real-life financial problems.	Activity sheets, calculators, real-life examples
4	Working Together	Students make their own simple interest problems and exchange with other groups.	Collaborative learning	To deepen understanding through group work and peer solving.	Manila paper, markers, calculators, group worksheets
5	Review and Reflection	Students review past lessons and write reflections about their learning experiences.	Review session, reflection	To refresh their knowledge and build confidence before the final test.	review sheets, reflection paper
6	Post-Test and Feedback	Students take the post-test and give feedback about the learning activities and strategy.	Post-assessment, feedback session	To measure improvement and gather student opinions about the intervention.	Post-test papers, pens

METHODS

Study Design

This study employed quantitative research through a one-group pretest-posttest design, a type of pre-
-experimental approach. 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).

In this context, this method was necessary for conducting action research, aiming to evaluate the effectiveness of an intervention with an experimental group assigned to the study. The group underwent a pre-test and a post-test. The experimental group applied the tested strategy, namely the INTER (identify, note, track, evaluate, review) strategy.

Partcipants

Purposive sampling, a non-random selection technique, empowers researchers to delve into specific populations by choosing individuals, cases, or events with key characteristics aligned with the research aims. This approach, also known as judgmental sampling, leverages the researcher's expertise to identify participants who can offer the most valuable insights, unlike random selection where chance dictates participant selection (Nikolopoulou, 2023).

In this case, the respondents of this study will be the Grade 7 students' level from Kapalong National High School. 58 students will be purposively selected as participants in this study in which it is based on their pre-test scores. This study included 11–12-year-old students from Kapalong Davao del Norte. The intervention focused solely in problem-solving specifically in simple interest appropriate for the participants' grade level. The researchers specifically selected Grade 7 pupils, to enhance their problem-solving skills in simple interest. The research aims to enhance problem-solving skills in simple interest. By the end of the study, students should improve their problem-solving skills and be able to solve simple interest through INTER strategy.

Instrumentation

This study used a questionnaire to measure problem-solving skills in simple interest. The test had 15 items, each worth 3 points, for a total of 45 points. The scores were distributed as follows: each correct response that properly utilized the INTER method = 3 points each, if the answer was correct but did not demonstrate the use of the INTER method = 2 points each, and an incorrect answer that also failed to apply the INTER method = 1 point each. To describe students' level of Problem Solving Skills, the researchers will use the percentage range below which was adapted from Yona and Loli (2021).

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Range of Percentage Score	Descriptive Level	Interpretation
90 - 100%	Outstanding	If the measures described in solving simple interests of the students is outstanding.
72-89%	Highly Satisfactory	If the measures described in solving simple interest of the students is highly satisfactory.
54- 71%	Satisfactory	If the measures described in solving in simple interest of the students is satisfactory
36 - 53%	Fairly Satisfactory	If the measures described in solving in simple interest of the students is fairly satisfactory.
18 - 35%	Needs Improvement	If the measures described in solving in simple interest of the students is needs improvements.
0 - 17%	Poor	If the measures described in solving in simple interest of the students did not meet the expectation.

Procedure

The researchers conducted assessments before and after the intervention to evaluate its effectiveness. The pre-test aimed to measure the problem-solving abilities of students prior to the intervention, while the post-test was designed to assess their knowledge and progress by using the same set of test questionnaire as in the pre-test. To gather the necessary data, the researchers followed these steps: First, they obtained approval from the school principals where the participants were enrolled. Next, they administered a pre-test to assess the initial problem-solving abilities of the students. Afterward, the INTER (identify, note, track, evaluate, review) strategy was introduced, followed by weeks of intervention period. At the conclusion of the study, a post-test was given using the same set of test questionnaires as the pre-test to evaluate any improvements in the students' problem-solving abilities. The data from both the pre-test and post-test were then collected and analyzed. The chart below shows the topics/competencies to be covered in each week of the study.

Week	Content	Task	Platform
Week 1	Simple Interest	Diagnose Phase: Pre-Test	Scientific Calculator
Week 2		Introduce the concept of simple interest	
Week 3		Introduce the intervention and explain it.	
Week 4		Conduct a dry run test for them in applying the intervention.	
Week 5		Monitor them in applying the intervention	
Week 6		Diagnose Phase: Post Test	

Ethical Considerations

Adhering to ethical standards in research was crucial as it guides the true objectives of the study, such as the pursuit of knowledge, truth, and the prevention of errors, while also fostering important values like trust, accountability, mutual respect, and fairness in collaborative work. To maintain ethical research practices, this study adhered to the ethical principles outlined in the Belmont Report (2010), which include respecting individuals' autonomy, promoting beneficence and non-maleficence, ensuring justice, obtaining informed consent, safeguarding confidentiality and data protection, maintaining integrity, and addressing conflicts of interest.

Data Analysis

In this study, the researchers gather data from both pre-test and post-test evaluations. They calculated the mean of the data and then compared the means of the pre-test and post-test using a paired t-test, alongside examining the standard deviation to assess the variation within the dataset and cohen's d to determine the effect size. This analysis aimed to identify any notable differences and assess whether the mean demonstrated an increase, indicating the efficacy of the intervention.

Following the tabulation and presentation of the means from both the pre-test and post-test data, the researchers conducted interviews. Aside from the quantitative analysis, qualitative data were gathered through in-depth interviews to gain a richer understanding of the intervention's impact. First, all interview transcripts were read multiple times and subjected to open coding, in which recurring phrases, ideas, and expressions were assigned short descriptive labels. These initial codes were then grouped and refined, eliminating redundancies and merging similar concepts in the process of data reduction. This step helped in organizing a large amount of raw data into manageable categories. From there, patterns were identified and clustered into emergent themes that reflected students'

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perceptions and experiences with INTER (Identify, Note, Track, Evaluate, Review) intervention. Thematic analysis revealed insights on the perceived effectiveness of the intervention, the benefits students experienced, and the challenges they encountered during its implementation. This qualitative process offered deeper context to the quantitative findings and highlighted the nuanced impact of the intervention from the learners' perspective.

Statistical Treatment of Data

The statistical tools employed in this study, namely the mean, standard deviation and paired t-test, played a crucial role in analyzing the gathered data. The mean, a fundamental measure of central tendency, provided insights into the average performance of students in both the pre-test and post-test phases. By calculating the mean scores from the total scores of students in each phase, researchers were able to gauge the overall level of engagement among participants before and after the intervention.

Moreover, the t-test enabled a comparison of means between two populations. It helped determine whether differences in mean scores between pre-test and post-test phases were statistically significant, shedding light on the interventions impact on the students problem-solving skills. Additionally, the t-test identified significant variations in problem-solving skills levels pre-intervention and post-intervention, offering valuable evidence to support the study's conclusions.

RESULTS

Research Question No. 1: What is the pretest result on the level of problem-solving skills in simple interest of the experimental group?

Presented in Table 2 shows the pre-test data on solving simple interest of grade 7 learners. Out of 10 sections there were 1 section with 58 students considered as participants for this implementation. It revealed that it has an overall mean of 36.44% indicating low performance by the pupils in pre-test. The highest score achieved was 45, while the lowest scores was 0. The most frequent score was 3, obtained by 12 students.

Table 2
Level of Problem-solving Skills in Simple Interest Before the Implementation of the INTER Strategy

Pre-Test Scores	Frequency	Percentage
0	7	15.56%
3	12	26.67%
6	7	15.56%
9	1	2.22%
12	7	15.56%
15	2	4.44%
18	2	4.44%
21	1	2.22%
27	1	2.22%
30	3	6.67%
33	5	11.11%
36	5	11.11%
39	3	6.67%
45	2	4.44%
Total	58	100.00%
	Overall Mean	36.44%
	Standard Deviation	14. 637
	Description	NEEDS IMPROVEMENT

Gunawan et al. (2023) said that junior high school students have low math problem-solving skills because of poor performance, difficulty with real-life problems, how they are tested, teaching quality, and other factors that need more study.

Likewise, the study of Ulya et al. (2024) looks at checking tools used to measure problem-solving skills of junior high school students, including Grade 7. The study found that many Grade 7 students have low problem-solving skills in math, especially in creative and real-life tasks. It shows the need for better tools and teaching methods to help improve these skills.

Furthermore, Putri et al. (2020) identified that contextual learning approaches significantly improve students' problem-solving abilities, suggesting that traditional teaching methods may contribute to low achievement in financial mathematics.

Research Question No. 2: What is the post-test result on the level of problem-solving skills in simple interest of the experimental group?

Presented in Table 3 shows the post-test data on solving simple interest of grade 7 learners. Out of 10 sections there were 1 section with 58 students considered as participants for this implementation. It revealed that it has an overall mean of 82.8%

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indicating high performance by the pupils in post-test. The highest score achieved was 45, while the lowest scores was 24. The most frequent score was 35 and 44, obtained by 6 students.

Table 3
Level of Problem-solving Skills in Simple Interest After the Implementation of the INTER Strategy

Post-Test Scores	Frequency	Percentage
24	1	2.22%
25	1	2.22%
26	1	2.22%
27	1	2.22%
29	1	2.22%
30	3	6.67%
31	3	6.67%
32	3	6.67%
33	2	4.44%
35	6	13.33%
36	2	4.44%
37	3	6.67%
38	4	8.89%
39	3	6.67%
40	3	6.67%
41	5	11.11%
42	4	8.89%
43	2	4.44%
44	6	13.33%
45	4	8.89%
Total	58	100.00%
		82.8%
Overall Mean		
Standard Deviation		**5.662**
Description	**HIGHLY SATISFACTORY**	

These findings were supported by Sinaga et al., (2023), which emphasized that a strong understanding of problem-solving is directly linked to improved mathematics learning outcomes. Demonstrated a significant improvement in Grade 7 students' problem-solving skills in simple interest after implementing the INTER strategy. By breaking down complex problems into manageable steps, the INTER strategy likely improved both students' procedural fluency (performing calculations) and conceptual understanding (identifying key information and choosing the correct formula).

Choirudin, Lubis, and Masuwd (2025) found that interactive media helps high school students improve in solving math problems by keeping them engaged and giving clear, step-by-step tasks. This matches the INTER strategy, which breaks big problems into smaller parts, helping students understand better and do well in tests.

Linaza et al. (2024) found that hands-on learning methods, like using tools and step-by-step problem-solving, help students improve their skills. This supports the use of strategies like INTER, which guide students through each step, build thinking skills, and lead to better scores—shown by the post-test average of 82.8% and many high scores.

Research Question No. 3: Is there a significant difference between the pre-test and post-test scores of the experimental group?

Presented in Table 4, a comparison between pre-test and post-test scores was carried out to determine the intervention's effectiveness. A total of 58 students took part in the study, during which their problem solving skills was measured before and after the introduction of the INTER (Identify, Note, Track, Evaluate, and Review) intervention. As illustrated in table are the results of the significant difference between the pretest and post-test scores indicating the paired-samples t-test was conducted to compare the scores the results indicate that there was a statistically significant difference between the scores, $t(57) = 11.90$, $p < .001$, indicating substantial improvement in student performance. The mean difference of 20.8 points

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illustrates the degree of academic progress achieved after the intervention.

Table 4
Significant Difference Between Pre-test and Post-test of the INTER Intervention

Paired Sample T-test								
		t	df	p	Mean difference	SE difference		Effect Size
Post-test	Pre-test	11.9	57	<.001	20.8	0.305	Cohen's d	1.57

Additionally, the effect size was calculated using Cohen's d, which was 1.57, suggesting a large effect. This indicates that the INTER strategy had not only a statistically significant but also a practically
meaningful impact on improving students' problem-solving skills in simple interest.

These findings are similar to Van der Spoel et al. (2020), who found that clear instructions, regular feedback, and step-by-step guidance help students do better. Their study shows how important clear teaching is, which supports the success of the INTER strategy.

Lewis and Estis (2020) found that team-based inquiry learning in math helped students understand the lessons better and solve problems more flexibly. This method used clear steps, feedback, and teamwork similar to the INTER strategy's way of solving problems.

Klang et al. (2021) found that using cooperative learning with clear problem-solving steps helped junior high students improve in math. Working in groups and following guided steps helped them think better and solve problems. This matches the INTER strategy, which breaks problems into smaller steps and gives support, explaining the big improvement in post-test scores.

Research Question No. 4: What are the students' insights into implementing the INTER (Identify, Note, Track, Evaluate, Review) intervention?

To address this research question, in-depth interviews are conducted with the informants and participants. Several sub-questions are asked to elicit their insights regarding the INTER intervention. The major themes and sample statements for research question number 1 are presented in Table 4, summarizing the participants' responses to their insights about the intervention. Participants shared their responses regarding their insights about the intervention. From their answers, seven major themes emerged: (1) enhancing learning through the note-taking process; (2) encountering difficulty in evaluation step; (3) perceiving taking notes as an effective strategy for enhancing memory and understanding; (4) integrating digital tools to enrich the INTER strategy; (5) improving INTER strategy through interactive learning strategies; (6) recommending INTER strategy for effective learning; and (7) fostering clearer conceptual understanding.

The study found that the utilization of the intervention is led to noticeable rise in students learning process in problem-solving involving simple interest. According to Salame et al. (2024), effective note-taking improves students' academic achievement, memory retention, and ability to retrieve information. It also emphasizes the importance of developing personalized note-taking techniques to enhance learning experiences. Similarly, Krapf and Pfefferkorn (2022) emphasized the application of different note-taking methods – like free notes, outlines, and matrix styles – stressing the importance of personalized approaches. Yuan (2024)

Table 4
Insights of Students in the Implementation of INTER: (Identify, Note, Track, Evaluate, Review) Intervention

Emerging Themes	Sample Statements
Enhancing Learning through the Note-Taking Process	• "The Note step, writing things down helped me remember better and notice what I did not understand right away." (IDI 02) • "The Note step help me the most in my learning. Write down key information from lessons like important definition, examples and steps in a process really help me remember them better." (IDI 05) • "For me, the Note part helps the most because when I write down what I have learned, it is easier for me to remember. It really sticks in my mind, and I also feel like I am already reviewing while writing, especially when solving numbers." (IDI 08) • "Writing notes helped them organize their thoughts and better understand key points." (IDI 09)
	• "For me, the difficult step is Evaluate because it analyzes data for insights." (IDI 01) • "The hardest step was evaluation, because it is hard to spot how well you really understand something." (IDI 02) • "...the hardest for me was to evaluate because is the part where I check if my answers are correct sometimes, I get confused with the numbers or the percentage" (IDI 03)

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Encountering Difficulty in Evaluation Step	• "The hardest I think is Evaluate because you have to solve the problem, and the easiest is Identify because it is easy to understand and easy to follow." (IDI 04) • "However, some found Evaluate difficult, especially when it came to self-assessing their understanding." (IDI 10)
Perceiving Taking Notes as an Effective Strategy for Enhancing Memory and Understanding	• "For me, writing down helps me remember lessons better because when I take notes, it makes it easier for me to recall the lessons." (IDI 01) • "Writing it down helped me remember the steps better." (IDI 02) • "It helps me remember lessons better because I was able to practice more when I write the formulas and solve examples, I understand the steps more clearly it also helps me when I review for quizzes or seat works." (IDI 03) • "Writing down that I learned was a game-changer for my memory. It is like my brain creates a stronger-connections with the information when my hand is involved." (IDI 05) • "Writing things down really helps me remember because I get to go through the lesson again while writing. Sometimes, when I just read, I easily forget it. But when I write, it feels like the information enters my brain better and stays longer, especially when solving numbers." (IDI 08) • "Writing helped students remember lessons by forcing them to process and summarize information in their own words. This active engagement strengthened their recall and made revision more effective." (IDI 09) • "Writing and noting down my learnings help me remember lessons it is also beneficial because it gives me more insights on our lessons." (IDI 10)
Integrating Digital Tools to Enrich the INTER Strategy	• "To enhance INTER and support students learning would be more effective if it provided straightforward feedback and used tech or calculators for calculations." (IDI 01) • "I suggest using digital tools or templates to make tracking." (IDI 06) • "It would be better if there were visual guides or sample outputs so we could have an idea of what to do in each step. Sometimes we get confused about what comes next or what exactly to write. It would really help me if we had something to look at as a guide, especially for solving numbers." (IDI 08) • "Students suggested using visual aids (like charts or templates) for tracking progress, incorporating digital tools or apps, and having peer or teacher feedback." (IDI 09)
Improving INTER Strategy Through Interactive Learning Strategies	• "To improve INTER, make it more fun, easier to follow, let us work in groups, and help us reflect and learn in our own way." (IDI 02) • "For me I think it would help if we had more fun examples related to real life like saving money or buying something using interest group activities could also make it more fun and easier to understand." (IDI 03) • "To improve student performance use in interactive techniques like game five learning and case studies and incorporate technology through tools like financial simulations." (IDI 07)
Recommending INTER Strategy for Effective Learning	• "Yes, I would recommend it. It is easy to follow and really helps with studying. It keeps you on track and helps you focus on what is important." (IDI 06) • "I would recommend it for myself because it really helps in organizing my thoughts and understanding the lesson better. Even though it is a bit hard at first, once you get used to it, it becomes really useful. I think my classmates would also benefit from it." (IDI 08) • "Most students would recommend it because it provides a clear structure for learning and helps build better study habits." (IDI 09)
Fostering Clearer Conceptual Understanding	• "Yes, I would, it helps me and my classmates actually understand it efficiently." (IDI 02) • "Yes, I will recommend it because the steps really help me understand our lessons better is organized and easy to follow and it helps especially when we are solving problems like simple interest." (IDI 03) • "Yes, I would recommend it because it helps to organize ideas and improve understanding of concepts." (IDI 01)

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Also reported the importance of note-taking as a multifaceted learning strategy, highlighting its cognitive, motivational and effective dimensions while offering insights for improving teaching practices.

Additionally, INTER strategy is encountering difficulty in evaluation step. Villanueva et al. (2024) highlighted that the evaluation phase often reveals challenges students face in verifying their answers, identifying errors, or understanding why a response may be incorrect. Similarly, Yayuk and Husamah (2020) emphasized that execution and evaluating were also weak areas, with only 8% successfully confirming their responses. In general, the findings emphasize a notable deficiency in mathematical problem-solving skills, underscoring the need for targeted instructional support and training.

Furthermore, taking notes as an effective strategy for enhancing memory and understanding. In connection, according to Zeyab et al. (2020), which shows that visual note recording is an effective tool for enhancing learning, creativity, and memory recall. The findings contribute valuable insights into how visual literacy and thinking can be integrated into educational practices. Supporting this, Feudel and Panse (2021) found that guided notes greatly enhanced students' concentration and comprehension of mathematical content during lectures by lessening the mental burden of extensive writing. Students indicated improved focus on the instructor's explanations and were more inclined to add verbal remarks to their notes, though they continued to favor what was displayed on the board.

Moreover, integrating digital tools to enrich the INTER strategy, is essential in helping students build a strong foundation in problem-solving involving simple interest. According to the claims of Esteve-Mon et al. (2022), that the importance of a strategic approach to digital transformation is crucial, proposing that higher education institutions should perceive these factors not as fixed conditions but as dynamic elements that can be enhanced and fostered over time. This perspective encourages institutions to actively participate in the transformation process instead of simply tolerating current conditions. Similarly, Saat et al. (2024) emphasized that incorporating digital tools into math education greatly enhances students' learning results and comprehension of mathematical concepts. These resources, such as game-oriented applications, improve students' problem-solving skills by encouraging engaging and creative methods. Increased engagement was noted as digital resources enhanced the enjoyment of learning and fostered active involvement.

Likewise, INTER strategy revealed that to enable the students to learn effectively and improve their problem-solving skills in simple interest, they must actively participate through interactive learning activities. Pada et al. (2024) explained that utilizing interactive learning strategies can result in significant enhancements in students' performance, rendering it a beneficial method for teachers aiming to enhance learning outcomes. Similarly, Pratiwi et al. (2024) found that interactive learning tools toward Problem-Based Learning (PBL) significantly improved students' skills in solving mathematical problems. Also, the effectiveness of assessments demonstrated significant enhancement in students' problem-solving skills, validating the educational influence of the media. The findings emphasize the importance of employing interactive, PBL-oriented tools to enhance mathematics learning results.

In addition, recommending the INTER strategy for effective learning is useful in the classroom setting and in teaching mathematics classes. According to Orsoni et al. (2023) claims that by providing suitable and challenging exercises, the method can enhance students' engagement and motivation. This is particularly important in face to face and online learning environments where maintaining student interest can be challenging. Similarly, Irshad (2024) found that engaging in hands-on tasks with physical materials greatly enhanced students' involvement in learning mathematics. Visual tools such as charts and diagrams enhanced understanding by rendering abstract ideas are more approachable and simpler to remember. The incorporation of these strategies significantly improved students' mathematical literacy and enriched their comprehension of fundamental math principles.

Added to that, to enable the students to learn effectively and improve their problem-solving skills in simple interest, they must foster clearer conceptual understanding. It relates to the study of Chimmalee and Anupan (2022), emphasized that the learning approach based on a mathematical understanding development strategy in a cloud learning environment significantly improved the mathematical conceptual understanding of undergraduate students compared to traditional teaching methods. This is also aligned to the study of Tonra and Ikhsan (2022) who found that the concept learning model notably enhances students' grasp of mathematical concepts by encouraging active and organized learning. It tackles typical challenges in math education, like weak understanding of concepts and insufficient student involvement. These findings endorse the application of concept-oriented models to improve teaching efficacy and student performance in mathematics.

CONCLUSION

The pre-test result revealed that Grade 7 students had a poor level of problem-solving skills before the INTER intervention. With an overall mean percentage score of only 36.44%, it was evident that students struggled particularly with concepts such as simple interest. These results reflect the need for targeted intervention, as students demonstrated insufficient foundational knowledge, making them vulnerable to problem-solving.

Following the implementation of the INTER intervention, the students showed remarkable improvement in their problem-solving skills. The post-test yielded a mean percentage score of 82.8%, which indicates a highly satisfactory outcome. This improvement suggests that the intervention significantly enhanced their understanding of problem-solving concepts, especially in solving problems related to simple interest. The intervention succeeded in bridging the gaps identified during the pre-test.

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The statistical analysis confirms the INTER intervention had a significant impact on improving problem-solving. A t-value of 11.9 with a p-value of <.001 shows that the improvement from pre-test to post-test is statistically significant. The large effect size of 1.57 (Cohen's d) indicates that the intervention had an extremely strong influence on learners learning. These results justify the effectiveness of the intervention as a strategic teaching tool in enhancing learners computational and conceptual understanding of problem-solving involving simple interest.

Students also shared meaningful insights about the intervention through focus group discussions and interviews. They highlighted the value of real-life application, the effectiveness of step-by-step approach, and how visualization enhanced their understanding. Many overcome their initial fear of problem-solving topics and gained confidence through guided, active learning. These insights demonstrate that the intervention was not only effective academically but also impactful in shaping learners' attitudes and motivation toward learning problem-solving involving simple interest.

In summary, the INTER intervention has proven to be an effective instructional technique in teaching problem-solving involving simple interest. It significantly enhances students' understanding and problem-solving skills in this area. This improvement contributes to their overall performance in mathematics. Moreover, it prepares them to meet future academic challenges with greater confidence. This action research underscores the potential of integrating active learning to effectively teach real-world problem-solving skills in high school.

RECOMMENDATIONS

Considering the low pre-test performance, it is recommended that schools conduct an initial assessment of problem-solving skills before introducing problem-solving topics in class. This helps identify specific areas where students struggle the most, such as simple interest. Teachers should also consider reviewing problem-solving concepts early to better prepare students for more complex topics. This proactive approach ensures that gaps in knowledge are addressed before they hinder further learning.

Given the success of this intervention in addressing students' lack of problem-solving skills in simple interest, the researchers recommend that teachers adopt this approach to boost student skills. This intervention not only help students find interest and enjoyment in learning Mathematics but can also be applied to other subjects. Furthermore, the study suggests that teachers incorporate more strategies or methods that capture students' attention and interest.

In this modern world, enhancing classroom pedagogy is crucial for achieving positive responses from students. By adopting innovative and engaging teaching strategies, teachers can foster a more interactive and enjoyable learning environment, ultimately improving student outcomes across various subjects.

Overall, the INTER intervention proved to be a transformative approach in addressing problem-solving gaps among Grade 7 students. To maximize its benefits, it should be institutionalized and supported by school policy. Further studies may be conducted to test its effectiveness in other contexts and grade levels. By doing so, the academe can foster a generation of problem solver students who are better prepared for real-world responsibilities and challenge

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