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PROJECT SOLVE (STUDENT OUTCOMES IN LEARNING VOLUME EXCELLENT): STRENGTHENING STUDENTS' ABILITY TO CONVERT UNITS OF VOLUME

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ABSTRACT
The purpose of this study was to determine the effectiveness of the Project SOLVE (Student Outcomes in Learning Volume Excellent) strategy in enhancing the ability of Grade 7 students to convert volume units. Twenty-eight students from Sampao Integrated School were purposively selected to participate in a pre-experimental one-group pre-test and post-test design. The intervention lasted one month and involved a systematic procedure that included a pre-test, implementation of the Project SOLVE strategy, and a post-test using the same assessment tool. Results revealed a substantial improvement in performance, with the mean score increasing from 49% on the pre-test to 73% on the post-test. A paired-samples t-test indicated a statistically significant difference between pre- and post-test scores, $t(27) = 6.91$, $p < .001$, $d = 1.31$, suggesting a very large effect size. These findings demonstrate the effectiveness of Project SOLVE in improving students' skills in volume conversion. Although some students reported difficulty during the evaluation phase of the intervention, qualitative data from interviews supported the quantitative findings by highlighting improvements in note-taking habits, motivation, and conceptual understanding. Overall, the study suggests that Project SOLVE is a promising strategy for strengthening students' mathematical competency in volume conversions.
KEYWORDS: *Project SOLVE, Unit Conversion, Volume, Mathematics Education, Philippines*

INTRODUCTION
Learning how to measure things like length, volume, weight, and time is important for students. It helps them understand and compare physical objects. To be good at math, students need to know how to calculate measurements (like volume = length × width × height) and understand units (like cubic meters for volume). But during the COVID-19 pandemic, online learning made it hard for students to learn these skills. Without a teacher's help, many had trouble understanding topics like converting units, which need clear explanations, practice, and quick feedback (Ojimba, 2022). Ahmed and Alkhateeb (2021) said students often just memorize volume units without really understanding them, which causes mistakes. Santos and Rivera (2023) also shared that the lack of hands-on learning and clear teaching added to the problem, showing that better teaching methods are needed.

Students in many countries struggle with converting units of volume, an important math skill. This is often because they don't fully understand the concepts, get confused between different units, or are taught in ways that don't help. In Canada, research shows that problems like poor teacher training and old curricula make it harder for students to learn the metric system, even though the country has tried to adopt it. Many still mix up metric and imperial units, causing mistakes in school and work (Smith et al., 2023). In the UK, Turner (2022) found that students often get confused when changing between different units for length and volume. In South Africa, Mokoena (2023) said that poor basic math skills and not using real-life examples make it harder for students to understand volume conversions. These studies show that this is a common problem in many countries. To fix it, better ways of teaching and updated lessons are needed. New tools, like pressure-drop models, can also help students see how what they learn in school is useful in real jobs.

In many areas of the Philippines, students find it hard to convert units of volume, which is a basic math skill. This difficulty is usually due to poor understanding of basic math, confusion with metric units, and not enough help or support in teaching. In Calbayog City, Ignacio and Bajet (2025) found that students have a hard time with measurement because of gaps in the curriculum and not enough practice. In Zambales, Punzalan and Buenaflor (2021) reported low student performance in geometry and measurement, showing a bigger issue with math skills. In Tagum City, Velez et al. (2023) saw that students had trouble with volume conversions because they didn't fully understand decimals and math terms. These studies show that the problem is widespread and that there is a need to improve the curriculum, teacher training, and teaching methods to help students do better in math.
While many studies have focused on improving basic skills like multiplication and division, few have looked into specific programs that help Grade 7 students with unit conversion, especially volume. Even though it's clear that strong arithmetic

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skills and teaching strategies like peer tutoring and hands-on activities help students (Awofala et al., 2023; Sen, 2022), most studies don't focus on the specific problems students face when learning unit conversion. Also, research usually looks at general learning methods and not on targeted programs like Project SOLVE (Zakariya, 2022). This study aims to bridge the gap by assessing the effectiveness of Project SOLVE in improving Grade 7 students' skills and confidence in converting volume units. It also seeks to address the important challenge of helping students develop these skills through the use of Project SOLVE as an intervention.

The study emphasizes the need for effective and engaging teaching strategies to enhance math learning, particularly because many students at this age level have difficulty with basic concepts that are essential for more advanced problem-solving and critical thinking. The research will be conducted at Sampao Integrated School, a local high school in Davao del Norte. Data will be gathered through paper-based survey questionnaires completed by Grade 7 students at the school. The goal of the study is to evaluate students' current abilities and track their progress in converting volume units through the use of the intervention. The findings from the data will help create focused strategies to overcome these challenges and enhance students' skills in this area. This study seeks to implement Project SOLVE as a method to enhance skills on converting units of measurement particularly in volume among Grade 7 learners. The researchers emphasize the need to improve the skills of students who are currently struggling in converting units of measurements in volume. The ultimate goal is to contribute to the development of school initiatives, with the intention of developing intervention programs intended to address students' skills

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RESEARCH QUESTION

The research questions below investigated reasons on how to address the ability to convert unit of conversion of Grade 7 students. Project SOLVE was the intervention for the learners to address this problem. The following research questions served as a guide for this study:

1. What is the pretest result on the level of ability to convert units of volume of the experimental group?
2. What is the post-test result on the level of ability to convert units of volume 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 Project SOLVE (Student Outcomes in Learning Volume Excellent) intervention?

PROPOSED INTERVENTION/PLAN

Project SOLVE (Student Outcomes in Learning Volume Excellent) was created to help students improve in math, especially in converting units of volume. The project believed that all students should have a fair chance to succeed. It focused on helping Grade 7 students at Sampao Integrated School during the 2024–2025 school year by creating a supportive and engaging learning environment.

To meet different learning needs, the project used a blended method that included personalized tutoring, hands-on workshops, and digital learning tools. It aimed to provide full support that goes beyond the regular classroom setup.

Session 1 (Orientation and Pre-Test)

The first session gave students an overview of the program. They were told what the project was about, when and where it would happen, and how it would be done. There was also an open forum for questions and concerns. After that, the students took a pre-test to check how much they already knew about volume and converting units like milliliters, liters, and cubic centimeters.

Session 2 (Introduction)

In this session, students learned the basic idea of volume—how much space a 3D object takes up. They were taught how and why it's important to convert volume measurements, especially within the metric system (like mL to L, or cm^3 to L), and sometimes between metric and customary units.

Session 3 (Board Work Activity)

Students were given more examples of volume conversion, including real-life situations like measuring water or medicine. Then, they practiced solving problems on the board. This activity helped them apply what they learned, boosted class participation, and allowed them to get immediate feedback from the teacher.

Session 4 (Tutorial)

Students who didn't do well on the pre-test got extra help from the teacher. The session focused on clearing up confusion and giving more practice. The teacher gave easy-to-follow steps and examples, helping students understand better in a small group setting where they could ask questions more freely.

Session 5 (Tutorial)

This follow-up tutorial continued to support students who needed more help. The teacher reviewed key concepts, gave more examples, and guided students through each step. This helped build their confidence and improve their understanding before moving on to more advanced lessons.

Session 6 (Post-Test)

To see how much students improved, they took a post-test on volume conversion. The teacher will compare the results with the pre-test to see if the activities and tutoring helped. This will show how effective the project was in closing learning gaps and improving student performance.

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Session	Estimated Time Duration	What will happen?
Session 1 (Orientation and Pre-Test)	1 hour	Students was informed of the things that they will be doing for the whole intervention period. After informing them, the Pre-Test are given.
Session 2 (Introduction)	30 minutes to 1 hour	In this session, students were informed about the conversion of volume – its definition, importance, and examples.
Session 3 (Board Work Activity)	30 minutes to 1 hour	In continuation, students were given more examples about unit conversion and gave them board works activity.
Session 4 (Tutorial)	30 minutes	In this session, the students who got low scores are being tutored by the researcher.
Session 5 (Tutorial)	30 minutes	In continuation, the students who got low scores are being tutored by the researcher.
Session 6 (Post-Test)	30 minutes	Students will complete a post-test to measure the improvement in their knowledge and skills compared to the pre-test.

METHODS

Study Design

To find out how Project SOLVE affected the Grade 7 students at Sampao Integrated School's capacity to convert volume units, this study used a pre-experimental approach. A pre-experimental design provides a simple framework for carrying out the research and is helpful in figuring out whether an activity or intervention effects results. Because it supports the study's objectives of evaluating the hypothesis and determining if the intervention significantly improved students' math abilities particularly in converting volume units this design was chosen. (Ary et al., 2021).

In this study, the researcher used an experimental method to do action research. They wanted to find out if using Project SOLVE could help improve students' skills in solving math problems. The researcher chose 28 students as participants. First, the students took a pretest. Then, they were taught using the Project SOLVE method for one month. After the intervention, the same students took a post-test to see if there was any improvement.

Participants

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 study, the respondents were Grade 7 students from Sampao Integrated School. 28 students will be purposively selected as participants in this study in which it is based on their pre-test scores. Grade 7 students were chosen because this stage marks the foundation of their knowledge in converting units of volume, making it a critical point for intervention. The intervention focused solely in converting units of volume appropriate for the participants' grade level. The researchers specifically chose Grade 7 students to help improve their skills in converting units of volume. The main goal of the study is to strengthen their ability in this area. By the end of the study, the students are expected to show improvement in converting volume units and solving related problems using the Project SOLVE strategy.

Instrumentation

This study used a researcher-made questionnaire to measure the ability to convert unit of volume. The test was consisting of 20 converting problems, which are multiple-choice items. The converting units of volume test has a full score of 20 points. Every correct answer on each item corresponds to 1 point.

In assessing the ability to convert units of volume of Grade 7 students at Sampao Integrated School, the researchers will use the percentage range below which was adapted from Meidiastuti and Safitri (2021).

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

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Procedure

To determine the efficacy of the intervention, the researchers performed tests both before and after. The post-test was created to evaluate students' knowledge and development using the same set of problems as the pre-test, while the pre-test was intended to gauge students' capacity to convert units of volume before the intervention. The researchers took the following actions in order to collect the required data: First, the researcher authorized the study by sending an official letter to the principal of the school. The principals of the schools where the participants were enrolled then gave their consent. They conducted a pre-test to gauge the pupils' early difficulties with volume conversion after obtaining the required authorizations. The Project SOLVE approach was then presented, and a one-month intervention period ensued. To assess whether the students' ability to convert units of volume had improved, a post-test was administered at the end of the study using the same set of conversion problems as the pre-test. After then, the pre-test and post-test data were gathered and examined.

Ethical Considerations

Students in Grades 7 at Sampao Integrated School participated in this study. To ensure the study was conducted ethically, ethical issues were taken into account and addressed appropriately.

Informed Consent. Informed consent means giving participants clear information about the study, including the activities they will take part in, how their data will be used, and any potential risks involved.They must give active, signed consent, acknowledging their rights to access their data and withdraw anytime. It is a formal agreement between researcher and participant (Denzin & Lincoln, 2011).

In this study, the researcher included an informed consent question in the printed survey form, allowing respondents to decide freely if they wished to participate despite any risks. Voluntary participation was emphasized, and students were encouraged to respond sincerely based on the survey provided.

Risk of Harm, Anonymity and Confidentiality. The respondent's information must be consistently safeguarded and treated with utmost confidentiality, extending beyond mere anonymity by refraining from disclosing their identity or related details. Ensuring anonymity and secrecy are crucial to protecting individuals from potential damage (Denzin & Lincoln, 2011).

The researcher made sure that all data remained secure and confidential in order to avoid hazards like social liability. Respondents received assurances regarding the protection of their identities and personal data. The data was anonymised, stored safely, and no identifying information was left. Three years following the end of the study, all data gathered will be deleted.

Conflict of Interest. The researcher's current affiliations or past activities may lead to a conflict of interest, which must be openly declared in an ethics approval application. This allows the committee to offer guidance on managing the conflict (Blanco, 2023).

Nevertheless, the study's researcher affirms that the research was conducted independently, without any affiliations or financial connections that may be seen as a conflict of interest. This perspective asserts that external variables did not influence the research outcomes since the participants were also students, and the researcher had no conflicting interests with the study.

Data Analysis

In this study, the researchers collected data from both pre-test and post-test results. They calculated the mean scores and compared them using a paired t-test to determine if there was a significant improvement. They also examined the standard deviation to understand how much the scores varied among the students. This analysis helped identify whether there was a noticeable increase in the mean score, which would suggest that the intervention was effective.

Coding. It was used to categorize and arrange the students' responses, assisting in the development of an ordered collection of topics pertaining to their responses.

Thematic analysis, based on Braun and Clarke (2013), was used to find recurrent themes or patterns in the data by categorizing and analyzing participant replies.

Data reduction was also used to simplify and condense the collected information, making it easier to analyze and present without losing important details.

Statistical Treatment of Data

The information gathered from the questionnaires was examined using various statistical methods to identify trends and relationships that align with the objectives of the study. These tools helped the researcher make conclusions and give recommendations based on the results.

Mean was used to determine the average level of the students' ability to convert units of volume, giving an overalll view of their performance.

Standard Deviation was used to assess how consistent the students' performances were in converting volume units, indicating the spread or variability of scores.

Paired T-Test was employed to assess if Project SOLVE had a significant influence on the students' progress by comparing their pre-test and post-test results.

Cohen's d was employed to evaluate the practical impact of Project SOLVE on the students' learning progress and estimate the effect size, which shows how significant the change was between the pre-test and post-test results.

RESULT AND DISCUSSION

Research Question No. 1: What is the pretest result on the level of ability to convert units of volume of the experimental group?

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Table 1 presents the pre-test results on students' ability to convert units of volume. A total of 28 Grade 7 students from one selected section participated in the study. The analysis revealed that the students had a mean score of M = 49%, with a standard deviation of SD = 3.61, indicating a fairly satisfactory performance prior to the intervention. The highest score obtained was 16, while the lowest was 4. The mode score was 11, achieved by five students.

Table 1. Level of Ability to Convert Units of Volume Before the Implementation of the Project SOLVE Intervention

Pre-Test Scores	Frequency	Percentage
4	2	7.1%
5	2	7.1%
6	1	3.6%
7	3	10.7%
8	1	3.6%
9	4	14.3%
10	4	14.3%
11	5	17.9%
14	1	3.6%
15	2	7.1%
16	3	10.7%
Total	**28**	**100%**
Overall Mean		**49%**
Standard Deviation		**3.61**
Description		**Fairly satisfactory**

Federation University Study Skills (2020) says that teaching unit conversion should be clear and well-organized. Students need to understand basic metric units like liters, milliliters, and cubic centimeters, and follow simple steps to change from one unit to another. When it comes to volume, this method helps students become more confident and accurate over time.

Similarly, Chase (2024) conducted a study that explains how to convert volume units in a simple and easy-to-understand way. It provides clear steps and examples to help students with difficult parts, such as understanding that volume units are measured in cubes (like cm^3 or m^3). The study also recommends using calculators and solving problems step by step to reduce errors and get correct answers. Overall, this study and others show that students learn better when they receive clear instructions, plenty of practice, and opportunities to review their work.

Sambayon et al. (2023) also found that many high school students struggle with converting volume units. Their research showed that students often don't fully understand the metric system, especially for volume. This problem gets worse because teachers don't always use real-life examples, and math ideas can feel too abstract. Instead of really understanding how units are connected, students just memorize conversion rules, which causes mistakes. To fix this, the researchers suggest using visual tools, real-world examples, and hands-on activities. These can help make the topic easier and more meaningful, so students can better understand how volume conversion works.

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

Table 2 presents the post-test data on converting units of volume among Grade 7 learners. Out of three sections, one section with 28 students was selected as participants for this implementation. The results revealed a mean score of M = 73% with a standard deviation of SD = 2.98, indicating a highly satisfactory performance in the post-test. The highest score achieved was 19, while the lowest was 9. The most frequent score was 11, obtained by five students.

Table 2. Level of Ability to Convert Units of Volume After the Implementation of the Project SOLVE Intervention

Pre-Test Scores	Frequency	Percentage
9	1	3.6%
10	1	3.6%
11	2	7.1%
13	4	14.3%
14	5	17.9%
15	4	14.3%
16	4	14.3%
17	4	14.3%
18	1	3.6%
19	2	7.1%
Total	**28**	**100%**
Overall Mean		**73%**
Standard Deviation		**2.98**
Description		**Highly Satisfactory**

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To support these findings, Özsoy and Ataman (2021) did a study showing that teaching students how to solve problems in a clear and organized way helps improve their math skills, including converting units. Their research with middle school students showed that using guided teaching methods and giving students enough practice helped them understand and apply measurement better. This proves that focused teaching strategies can lead to better learning outcomes, just like in your study where students did well on their post-test.

Also, a recent study by Paolucci et al. (2024) pointed out how better ways of teaching math can lead to higher student success and satisfaction. The study, based on advice from experts and teachers, showed that student-centered methods like group work and active participationhelp students understand math topics better, including measurement and unit conversions. The authors explained that these teaching styles make students feel more included and help them learn more effectively, which matches the strong results from your study after using targeted teaching methods.

In addition, Oribhabor and Ubani (2020) found that Grade 7 students who learned through hands-on activities did much better in converting volume units than those taught with the usual lecture method. Using real-life examples and tools helped students better understand and accurately convert volume units. This shows that practical and engaging teaching methods can help students learn measurement concepts more effectively.

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

Presented in Table 3, a comparison between pre-test and post-test scores was carried out to determine the intervention's effectiveness. A total of 28 students took part in the study, during which their ability to convert unit of volume was measured before and after the introduction of the Project SOLVE intervention. As illustrated in table are the results of the significant difference between the pretest and post-test scores, indicating the performance levels of 28 students in the experimental group converting units of volume, $t(27) = 6.91$, $p < .001$. Since the probability value ($p < .001$) is less than the level of significance ($\alpha = 0.05$), the null hypothesis is rejected. This means that there is a significant difference between the pretest and post-test scores.

In terms of the mean scores, the mean difference resulted 24%, which indicated the improvement of scores, with the higher precision based on the standard difference of 0.698. The Cohen's d of 1.31 indicates an extremely large effect size, meaning the intervention had a very strong impact on improving students' ability to convert units of volume.

Table 3. Significant Difference Between Pre-test and Post-test of the Project SOLVE Intervention

Paired Sample T-test								
		t	df	p	Mean difference	SE difference		Effect Size
Post-test	Pre-test	6.91	27	0.001	24%	0.698	Cohen's d	1.31

The study showed that students got much better at math, especially in converting units, after using Project SOLVE. This was clear from the big improvement in their test scores before and after the program. The project helped students understand how to convert units of volume by using practical and hands-on activities, which made learning easier and more meaningful. This supports Eli's (2021) study, which says that interactive ways of learning can improve school performance. By involving students in activities like those in Project SOLVE, they become more engaged, motivated, and better at remembering what they learn.

Also, Son and Fatimah (2020) found that hands-on learning activities help students improve in math. Their research showed that students who learn by doing understand math better and gain confidence in solving problems.

Finally, Batoy and others (2022) found that students improved a lot in converting volume units after using group learning strategies. Their test results showed that working together in a supportive setting helped students learn the topic more effectively.

Research Question No. 4: What are the students' insights into implementing the Project SOLVE (Student Outcomes in Learning Volume Excellent) intervention?

To answer this research question, in-depth interviews were conducted with the participants. Probing questions were asked to elicit their concept regarding the insights about Project SOLVE. The major themes and supporting statements were presented in Table 4. Participants had their responses to their own experiences and observation. From the answers of the participants, seven major themes emerged: (1) clear understanding through step-by-step instruction; (2) increased confidence in learning math; (3) group work encouraged learning and fun; (4) tutorials and focused teaching improved learning; (5) struggles with large numbers and formulas; (6) need for more learning aids (charts, guides, videos); and (7) desire for more fun and interactive activities.

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Table 4. Insights of Students in the Implementation of Project SOLVE (Student Outcomes in Learning Volume Excellent) implementation?

Emerging Themes	Supporting Statements
Clear Understanding Through Step-by-Step Instruction	• "Because of the step-by-step teaching, it is easier for me to understand now." *(IDI1)* • "Especially the step-by-step instructions on what to do in converting." *(IDI2)* • "Through the step-by-step lessons, I understood better how to convert units." *(IDI3)* • "We were taught step-by-step so we could understand the lesson more easily." *(IDI4)* • "Project SOLVE helped me because everything was clearer and easier to understand due to the step-by-step teaching." *(IDI7)*
Increased Confidence in Learning Math	• "Now I am confident that I can understand and answer correctly." (IDI1) • "Before I was scared to answer... but now I became more confident." (IDI4) • "Before, I had no confidence in math, but now I do." (IDI5) • "My confidence in participating and solving in front of the class increased." (IDI8) • "Now I'm no longer afraid to answer in class when it comes to conversion." (IDI9)
Collaborative Work Encouraged Learning and Fun	• "Group activities were helpful, fun, and made it easier to understand." (IDI3) • "Group activities helped us understand the lessons better and avoid mistakes." (IDI4) • "If I did not get the solution, I would look at how my groupmate solved it." (IDI5) • "We solve problems together. I also help others as a leader." (IDI6)
Tutorials and Focused Teaching Improved Learning	• "I liked the tutorial most because I understood more easily." (IDI7) • "We could ask questions right away if we did not understand." (IDI10) • "I liked how you tutored some of our classmates." (IDI2)
Struggles with Large Numbers and Formulas	• "I had difficulty when converting to cubic meters... too many zeros." (IDI1) • "I experienced difficulties when I forgot the step-by-step process." (IDI3) • "I struggled especially when converting large numbers." (IDI4) • "I struggled because I would forget the formula to use." (IDI8) • "I got a bit confused when we had to use the volume formula and then convert." (IDI9)
Need for More Learning Aids (Charts, Guides, Videos)	• "Better to have more visual aids or charts posted in the classroom." (IDI1) • "Add more charts that show the step-by-step explanations." (IDI3) • "It would help to always have a printed guide." (IDI8) • "Better if we had printed guides we could take home." (IDI10) • "Video tutorials would help me remember better." (IDI9)
Desire for More Fun and Interactive Activities	• "Add games to each session to make it more fun." (IDI2) • "More activities to make the class more fun and not boring." (IDI7) • "A review game would also be helpful." (IDI9) • "Give short quizzes after each topic to check if we understood." (IDI10)

The first theme that emerged is Clear Understanding Through Step-by-Step Instruction. Students repeatedly emphasized how breaking down lessons into clear, sequential steps made it easier for them to grasp complex concepts, particularly in unit conversions. The responses of the students confirm that structured, sequential instruction reduces confusion and supports comprehension. Recent research of Bandahala (2024), demonstrates that explicit, step-by-step instruction such as the concrete pictorial abstract approach-significantly improves mathematics performance and helps students internalize concepts more effectively. Students benefit greatly when lessons are broken down into clear, sequential steps especially in mathematics, where concepts build on each other. This approach aligns with Direct Instruction Theory, which emphasizes explicit, structured teaching. Direct instruction methods such as modeling, guided practice, and immediate feedback are highly effective in improving student achievement in math, particularly for procedural skills like unit conversion.

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The study's meta-analysis by Stockard et al. (2020), found that students taught with direct instruction outperformed those taught with less structured methods, confirming that step-by-step teaching reduces confusion and supports comprehension.

Additionally, the second theme is Increased Confidence in Learning Math. Many students said they felt more confident answering questions and joining class discussions after the activities. This shows that positive experiences and guided practice can help students believe in themselves and take part more actively. A review by Zakariya (2022) supports this, showing that activities that build self-confidence like practice and helpful feedback can boost students' belief in their math skills. Confidence plays a big role in helping students stay involved and do well in math. According to Bandura's Self-Efficacy Theory, students' beliefs about their abilities affect how motivated they are and how well they perform. Usher and Pajares (2021) also found that strategies like giving students success experiences, showing examples, and giving encouraging feedback can improve confidence and participation in math. These approaches help students overcome fear, feel more comfortable answering questions, and keep trying even when math is hard.

Further, the third theme is Group Work Encouraged Learning and Fun. Students liked working in groups because it made lessons more fun and helped them understand better by learning from classmates. This shows that working together builds teamwork, shared responsibility, and deeper understanding. Capar and Tarim (2021) found that working together in math class helps students do better, especially when solving problems. Social Constructivism supports this idea it says people learn better when they interact and share ideas. Johnson and Johnson (2020) also found that group work, like solving problems together and teaching each other, helps students learn more and enjoy math. When students help each other, they ask questions, explain ideas, and learn in a fun and effective way.

Furthermore the fourth theme is Tutorials and Focused Teaching Improved Learning. Students appreciated tutorial sessions where they could ask questions and get one-on-one help. These comments show that focused and personal teaching helps students fix learning gaps and understand better. Sharma (2024) said that personal teaching and feedback, sometimes using technology, can improve learning and motivation in math. This matches the ideas of Personalized Learning Theory, which focuses on meeting each student's needs. Sharma and colleagues (2021) found that one-on-one tutorials and personal feedback really help students understand and feel more motivated. These sessions let students ask questions right away and clear up confusion, which builds their learning and confidence.

In addition, the fifth theme is Struggles with Large Numbers and Formulas. Some students had a hard time working with big numbers and remembering formulas, especially in problems with many steps. This means students need more help and practice in these areas. Fuchs et al. (2021) suggest that teachers should teach step by step and start with easy numbers so students can build their skills before trying harder problems. According to Cognitive Load Theory (Chen et al., 2018, cited by Springer Nature, 2025), our brain can only handle so much at once. Complex math can overwhelm students. So, breaking problems into smaller parts and using simple numbers can help them understand better especially when teaching conversions or using formulas.

Moreover, the sixth theme is Need for More Learning Aids (Charts, Guides, Videos). Students said that visuals and multimedia tools would help them understand and remember better. This supports using both pictures and sound in teaching to make learning clearer. Bandahala (2024) found that using images and multimedia in math lessons helps students understand better. Dual Coding Theory supports this idea, saying that combining words and pictures helps students learn and remember more. Mayer and Fiorella (2022) reviewed studies showing that things like charts, guides, and videos improve learning and memory in math. These tools help students see what they're learning, remember it better, and stay interested.

Lastly, the seventh theme is that students want more fun and interactive activities. They asked for more games, quizzes, and hands-on tasks to make learning more enjoyable. This shows that fun lessons help keep students interested and motivated. Cabero-Almenara et al. (2022) said that using games and digital tools in math classes can make students more eager to learn. This connects to Gamification Theory, which explains that adding fun parts like points, prizes, and challenges can help students get more involved in learning. Sailer and Homner (2020) also found that using games in teaching makes students more motivated and focused. These kinds of activities make learning more fun, help students take part in class, and improve how well they remember the lesson.

CONCLUSION

Based on the findings of the study, the following conclusions were drawn:

At the beginning, the pre-test results showed that students had a "fairly satisfactory" ability in converting units of volume. This means they had some basic understanding, but their skills were not strong or consistent. They were able to solve simple conversions but struggled with more difficult problems. These findings pointed to the need for a targeted intervention to help improve their basic skills and build their confidence.

After applying Project SOLVE, the post-test results improved to a "highly satisfactory" level. Although there's still room to grow, this shows clear progress. Students became more accurate, efficient, and confident in solving volume conversion problems. Project SOLVE likely helped through activities like hands-on learning, solving real-life problems, and guided practice, which improved their understanding and ability to apply what they learned.

A statistical test (paired-samples t-test) confirmed that the improvement was significant, with the results showing a large effect ($t(27) = 6.91$, $p < .001$; Cohen's $d = 1.31$). This means the intervention had a strong positive impact on the students' performance.

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Interviews with students also showed that Project SOLVE helped in other ways. Students talked about being more engaged, using visual aids, making their own strategies, and working well with classmates. Even though some faced issues like group disagreements or slow feedback, most students said the step-by-step approach helped their confidence and understanding. Overall, Project SOLVE not only improved their performance but also increased their motivation and interest in learning how to convert units of volume.

RECOMMENDATION

The following recommendations are suggested based on the study's findings:

Since the Grade 7 students showed big improvement in converting volume units, it is suggested that Project SOLVE be used in all grade levels at Sampao Integrated School. Adding it to the regular lessons can help more students understand math better through its clear and organized teaching method.

School heads and leaders should support this program by giving clear rules and providing things like learning materials, teacher training, and realistic goals. Their support is important to make sure the program lasts and works well.

Teachers should be trained properly on how to use Project SOLVE. This can be done through workshops and regular training sessions, so they can fully learn the methods and tools of the program. With enough training, teachers can guide students more effectively.

Parents and guardians should also be involved in their children's learning. They should be informed about what Project SOLVE is and how it helps their children. This can be done through meetings or workshops. When parents are involved, they can better support their kids at home.

Lastly, even though the results are positive, more research is still needed. Future studies can look at the long-term effects of Project SOLVE on students' learning. It would also be useful to compare results from other schools or places to see how well the program works in different situations and how it can be improved.

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