Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

The Effects of Project IDEAL on Learners' Arithmetic Performance in Key Stage 2 Mathematics

Michelle C. Rubica
School of Graduate Studies, STI West Negros University, Philippines
michelle.rubica@deped.gov.ph

Renith S. Guanzon
Program Head, SGS, STI West Negros University, Philippines
renithguanzon10@gmail.com

Publication Date: December 22, 2025 DOI: 10.5281/zenodo.18149741

Abstract

This study aimed to examine the effectiveness of Project IDEAL on learners' arithmetic performance in Key Stage 2 Mathematics in a medium-sized public elementary school in Western Visayas for the school year 2025-2026. The study employed a quasi-experimental design, analyzing the comparison of the pretest and post-test results of the respondents. Additionally, the study employed the matched-pairing technique to select participants, comprising 40 Grade 5 learners from one section. The study was conducted over a period of two (2) months. Mean and t-tests were used in the treatment of data. The results revealed that both the control (traditional instruction) and experimental (tablets with math apps) groups had substantial increases in learners' arithmetic performance after the intervention, indicating that both methods of instruction are effective. In addition, there was no significant difference found between the pretest and post-test results of the control and experimental groups, as well as the post-test results between the control and experimental groups. Although there were no statistically significant differences, the experimental group showed a greater effect than the control group. It is concluded that Project IDEAL is effective in improving the arithmetic performance of the learners. To maximize its effectiveness, it is recommended that the intervention be continued for a longer period of time.

Keywords: *Project IDEAL, Learners' Arithmetic Performance, Key Stage 2 Mathematics, Traditional Instruction, Experimental Study*

INTRODUCTION

Nature of the Problem

Two of the most prominent goals of the Sustainable Development Goals (SDG) are to provide learners with high-quality education (SDG 4) and foster innovation through science, technology, and digital connectivity (SDG 9). Key actions include scaling up the quality of education and building digital competencies in public institutions to help strengthen the numeracy skills of all early-grade Filipino learners

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

(Saini et al., 2023). By prioritizing these goals, the country can ensure that its next generation learners are equipped to tackle future challenges and contribute to sustainable growth.

Numeracy is the set of abilities that a learner needs to perform mathematical operations. It involves identifying and comprehending the world's mathematical processes. As learners advance, their number-matching and critical thinking skills become highly developed. These abilities enable students to use arithmetic to make informed decisions and solve problems (Kurmaniak, 2021). The four fundamental operations—addition, subtraction, multiplication, and division—are not just about passing the test; they are about laying a strong foundation for future mathematical success. These operations serve as the building blocks for more complex concepts learned in later grades, such as algebra and geometry. However, a considerable number of children struggle with solving arithmetic problems, which can lead to difficulties in their future mathematical learning (Boz, 2024). Hence, learners need additional instructional support and remediation activities to help them improve, develop, and enhance their arithmetic skills.

Project IDEAL is a numeracy intervention program implemented in Grade 5. The intervention focuses on teaching and learning mathematical concepts and skills. In particular, the intervention aims to increase students' knowledge of mathematics and their ability to process information mathematically. By carefully integrating selected applications, such as "Math Games by Lucas and Friends," into the learning environment, Project IDEAL transforms traditional numeracy practice into interactive activities, making learning more engaging and enjoyable.

In the present research setting, the researcher, a mathematics teacher at the grade 5 level, has observed students struggling with the four basic operations. More than half of the Grade 5 learners' population scored less than 50% on the Enhanced Regional Unified Test (E-RUNT), possibly due to a lack of understanding of the concept itself and insufficient parental follow-up at home. Since the DepEd provided the school with tablets, this became the researcher's motivation to develop a numeracy program that would help the learners strengthen their numeracy skills. That is why the researcher initiated a study to assess the effectiveness of Project IDEAL: Improve, Develop, and Enrich Arithmetic Skills for Learners, to address the issue and help learners master the four basic operations.

Current State of Knowledge

The widespread use of tablets nowadays can provide support for better education. Through various applications that could be freely installed, learning was possible at any convenient place and time. Among the school subjects, mathematics was one of the most difficult to learn (Barrientos, 2021). The integration of educational apps and gamification elements has also demonstrated positive outcomes in mathematics education. Incorporating gamified elements, such as rewards and challenges, can enhance motivation and make the learning process more enjoyable (Igcasama et al., 2023). The gamification of mathematical tasks transforms learning into an enjoyable and interactive experience, encouraging students to persist in problem-solving and skill acquisition (Ondog et al., 2023).

Project IDEAL is a numeracy intervention project to detect gaps in learners' mathematical learning (Smith, 2024). The target of intervention is to increase the students' knowledge of mathematics, their ability to process information mathematically, and their preferences for mathematics through exposure to tablets with math apps, games, and short videos on numeracy skills. Project IDEAL transforms traditional numeracy practices into interactive activities, making learning more engaging and enjoyable. According to Canilao and Gurat (2023), math applications and online tools can help students develop a fundamental understanding of mathematical processes that will serve as a basis for more complex math problems in the future. Math educators who present open math tasks help students develop a conceptual understanding of mathematics rather than becoming hung up on memorizing facts. Providing learners with personalized

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

learning experiences may be accomplished in various ways. For example, take quizzes to determine which topics they have learned and which concepts they need to experience more. Making it possible for students to plan and control their learning pathways is a compelling argument for using technology in our mathematics education.

On the other hand, the traditional lecture method is still effective, and it is the most commonly used by most teachers. Alaagib et al. (2019) found that lecturing, whether effective or not, remains the most commonly used learning method, as it is an economical and practical approach, especially when the number of students is large and resources are limited. Traditional lecture is an effective strategy in improving learners' arithmetic performance. The continuous use of numeracy drills and exercises, flashcards, and board work had greatly improved learners' performance in four fundamental mathematical operations despite limited support resources. Therefore, traditional teaching techniques remain valuable in fostering academic growth in arithmetic skills. Pan and Sana (2021) reiterated that pretesting entails taking practice tests before learning information rather than after. This method is also known as erroneous creation or pre-questioning. Since the pretest contains information that learners still need to learn, it is not always possible to ensure that they will perform well on the pretest. Because of this, it is still permissible for the learners to have low performance in the pretest. Culpable et al. (2024) revealed that Project TABANG significantly improved mathematical skills using only its personalized and hands-on instructional approach. At the same time, Ismail and Maat (2020) demonstrated a significant improvement in students' performance and productivity, despite not having iPads for mathematics instruction. Smith (2024) reveals that only one skill on the baseline assessment is common to both groups, indicating a need for explicit skill instruction, multiple learning opportunities, and embedded practice in both special and general education settings.

The use of math apps enhances learners' arithmetic performance. Villasoto (2024) revealed that, before implementation, intermediate learners performed poorly in mathematics. Although there is an increase in scores after implementation, the results still show that intermediate learners performed poorly in mathematics. However, comparing these results to the pretest before the implementation of Project IDEAL reveals a significant improvement in the performance of intermediate learners. Likewise, Quilloy (2023) found significant improvement in learners' mathematics performance after the Math Game Apps intervention. Aspiranti and Larwin (2021) revealed that tablet-based math interventions provided moderate positive effects on student math gains. Uwineza et al. (2023) found that the Interactive Math software demonstrated greater performance than the traditional class, based on the effect size of significance and learning gains. Magtolis III (2023) revealed a significant difference in numeracy levels following the implementation of the Project Renrich intervention program. Moreover, Munda et al. (2024) revealed a significant difference between the pretest and post-test performances, thus confirming the effectiveness of the Project COUNT intervention program in strengthening students' numeracy skills.

Further, both the traditional method and the use of tablets are effective in improving learners' arithmetic skills. Ismail and Maat (2020) revealed that the post-test results show no statistically significant difference between students who used iPads in learning activities and those who learned without iPads. Likewise, Barrientos (2021) showed that both the pedagogical design and the features of the math app design significantly improved the students' academic performance. Moreover, Kaur, Koval, and Chaney (2017) found that iPads, when used in conjunction with traditional teaching methods, enhanced students' conceptual understanding of numbers and skills. The iPads and math apps kept the students engaged, focused, and motivated as they learned the skills being taught. Moreover, Masaganda and Limpiada (2023) found that the difference between the post-test scores of non-technology-based and technology-based instructions is not statistically significant.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

Theoretical Underpinning

Vygotsky's Zone of Proximal Development (1930) serves as the foundation for this study. This theory emphasizes the importance of scaffolding and providing appropriate guidance to learners within their ZPD, which is the difference between what they can do independently and what they can achieve with guidance.The Zone of Proximal Development (ZPD) is the term used by Vygotsky to describe the tasks that a child needs to complete in order to learn. Vygotsky described the Zone of Proximal Development (ZPD) as the space between a child's current developmental level, which is based on their ability to solve problems on their own, and their potential developmental level, which is based on their ability to solve problems with the help of an adult or with other children who are more skilled.

Moreover, Vygotsky asserted that a child emulates an adult, gradually gaining the ability to perform tasks independently. He believed that leaving children to discover everything on their own would hinder their progress. He suggested that teachers should not present difficult material and burden them with heavy loads. Meanwhile, the design of instructional scaffolding aims to facilitate a deeper level of learning, thereby completing the learning process. Scaffolding is a form of support provided during the learning process that meets the student's needs to help them achieve their learning goals. Scaffolding is one of the keys to effective teaching, which includes modeling a skill, providing cues and hints, and adapting an activity to meet the learner's needs. Making the task simple and gaining and maintaining the child's interest in it are two of the processes that help achieve effective scaffolding.

The Zone of Proximal Development proves helpful in this study, as it enables students to learn under the guidance of teachers who use scaffolding teaching methods to maintain learners' interest while developing their arithmetic performance. In this study, the use of tablets with math apps is beneficial in determining the arithmetic performance of the learners in four basic operations. Continuous exposure to tablets with math apps strengthened learners' arithmetic performance.

Objectives of the Study

This study aimed to determine the effects of the IDEAL project on learners' arithmetic performance in Key Stage 2 mathematics in a public elementary school in Western Visayas during the school year 2025-2026. Specifically, it aimed to determine 1) the level of learners' arithmetic performance in the pretest and post-test of the control group; 2) the level of learners' arithmetic performance in the pretest and post-test of the experimental group; 3) whether a significant difference exists between the pretest and post-test in the level of learners' arithmetic performance of the control group; 4) whether a significant difference exists between the pretest and post-test in the level of learners' arithmetic performance of the experimental group; 5) whether a significant difference exists between the pretests in the level of learners' arithmetic performance of the control and experimental groups; and 6) whether a significant difference exists between the post-tests in the level of learners' arithmetic performance of the control and experimental groups.

RESEARCH METHODOLOGY

This portion presents a discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, conduct of the study and the statistical tools and procedures for data analysis.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

Research Design

This study employed a quasi-experimental design that follows a pretest-post-test structure. Two groups were created, consisting of a control group and an experimental group. A quasi-experiment is an empirical study used to estimate the impact of an intervention on its target group without the use of random assignment. Rogers and Revesz (2019) noted that quasi-experimental research designs aim to establish a relationship between independent and dependent variables. In other words, it is expected that the independent variable will cause some variation or change in the dependent variable. The design has two groups of subjects: a control group and an experimental group (receiving Project IDEAL). Both groups were measured twice: the pretest (first measurement) and the post-test (second measurement). A pretest is necessary to determine the magnitude of the difference between the control and experimental groups and to provide baseline information to determine the amount of change resulting from the given treatment. The post-test is used to measure the mastery of instructional materials (tablets with math apps, games, and short videos) and is administered at the end of the study. This design compares the arithmetic performance between the control and experimental groups. It measures the degree of change resulting from the treatment, Project IDEAL. This approach allows the researcher to assess the effect of the experiment by assessing the difference between the pretest and the post-test arithmetic performance.

Study Respondents

The respondents of the study are composed of 40 key stage 2 non-numerate learners. The respondents were selected using purposive sampling and matched-pairing method. According to Ames et al. (2019), purposive sampling is a non-probability sampling method that is selected based on the characteristics of a population and the study's objective. Most researchers use purposive sampling when they want to access a particular subset of people, as all participants in a survey are selected because they fit a specific profile.

On one hand, according to Bobbit (2021), matched-pairing (or matched pairs design) is a research method used to create equivalent control and experimental groups by pairing participants who are similar on key characteristics before assigning them to different conditions. Instead of assigning participants completely at random, researchers first match individuals into pairs based on variables that could influence the outcome of interest (e.g., age, gender, baseline scores, socio-economic status). Then, within each matched pair, one participant is randomly assigned to the experimental group (receives the treatment) and the other is assigned to the control group(receives no treatment or a comparison condition). This design helps control for confounding variables and reduces between-subject variability, making it easier to detect true effects of the independent variable.

Instrument

The data-gathering instruments were the pretest and post-test, which were self-made by the researcher for four fundamental operations. The pretest aims to measure learners' arithmetic performance in four fundamental operations prior to the study's commencement. The learners receive the pretest prior to the experiment. The post-test was administered to measure the effect of the intervention activities after the implementation of Project IDEAL. The researcher utilized a validated and reliable questionnaire on four fundamental operations. The pretest and post-test consist of forty (40) multiple-choice test items. It consists of eight (8) items per operation and two (2) items of word problems per operation, for a total of 40 items administered for 60 minutes only. The research instrument was subjected to validity (4.78-excellent) and reliability (0.827-excellent).

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

Data Gathering and Procedure

To facilitate the smooth conduct of the study, the researcher employed the following procedures: a letter of request was addressed to the Schools Division Superintendent for approval to conduct the study. After receiving approval, the researcher also sent a separate letter to the concerned school head. The researcher asked permission from the school head to administer the research instrument to the study respondents. The school head also approved the date the research instrument is administered, the retrieval date, and the duration of Project IDEAL's implementation prior to conducting the study.

Conduct of the Study

After obtaining approval to conduct the study, the researcher also sought consent from the parents of the subject respondents and explained the purpose of Project IDEAL. Project IDEAL is a numeracy intervention project to detect gaps in learners' mathematical learning. The target of intervention is to enhance learners' arithmetic performance by exposing them to tablets with math apps, games, and short videos on numeracy skills. The intervention was conducted for 8 weeks from September 9 to October 31, 2025. The first and second weeks will cover lessons on addition involving two and three digits using the tablets; the third and fourth weeks covered topics on subtraction and worded problems involving addition and subtraction; the fifth and sixth weeks covered lessons on multiplication involving two and three digits; and the seventh and eighth weeks covered topics on division and worded problems involving multiplication and division.

To determine the subject respondents for the control and experimental groups to undergo intervention, the researcher identified 20 male and 20 female grade 5 learners with low mathematics performance in the first grading period. The learners were evenly distributed, comprising 10 male and 10 female learners in the control group and 10 male and 10 female learners in the experimental group using matched-pairing method. The subject respondents were not disclosed to promote fairness and inclusiveness, as well as to protect learners' identities and prevent bullying from peers after they participated in the intervention.

The first part of implementing Project IDEAL involves administering a pretest to both the control and experimental groups to determine their baseline performance in the four fundamental mathematical operations. The second part involved conducting actual interventions with both the control and experimental groups. The control group was exposed to traditional methods of teaching, including four fundamental operations such as board work, practice drills, and flashcards. The experimental group was exposed to a daily intervention using a tablet with math apps, games, and short videos on four fundamental mathematical operations. The third part involved administering post-tests to both the control and experimental groups. The tests were given to the learners after the completion of the intervention program to measure their arithmetic performance in four fundamental operations. The results of the pretest and post-test for the control and experimental groups were compared and analyzed to determine the effects of the IDEAL project, which utilized tablets with math apps, on learners' arithmetic performance.

Data Analysis and Statistical Treatment

Objective No. 1 used the descriptive analytical scheme and weighted mean to determine the level of learners' arithmetic performance in the pretest and post-test of the control group. Objective No. 2 used the descriptive analytical scheme and weighted mean to determine the level of learners' arithmetic performance in the pretest and post-test of the experimental group. Objective No. 3 used the comparative

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

analytical scheme and t-test to determine if a significant difference exists between the pretest and post-test in the level of learners' arithmetic performance of the control group. Objective No. 4 used the comparative analytical scheme and t-test to determine if a significant difference exists between the pretest and post-test in the level of learners' arithmetic performance of the experimental group. Objective No. 5 used the comparative analytical scheme and t-test to determine if a significant difference exists between the pretests in the level of learners' arithmetic performance of the control and experimental groups. And, objective No. 6 used the comparative analytical scheme and t-test to determine if a significant difference exists between the post-tests in the level of learners' arithmetic performance of the control and experimental groups.

Ethical Considerations

The researcher prioritized the respondents' voluntary participation, informed consent, risk of harm, confidentiality, and anonymity to prevent any violations of human rights during the research process. Participation in the study was voluntary, and the respondents could withdraw at any time without any consequences. The researcher informed them about the study's academic purpose. Only the researcher had access to the research data, ensuring confidentiality. Moreover, during the study, the researcher strictly observed the governing guidelines and policies of the Data Privacy Act of 2012 to ensure security measures are in place to protect personal and sensitive information. This commitment to ethical standards fostered trust among participants and enhanced the integrity of the research findings. By adhering to these guidelines, the researcher aimed to uphold the highest level of professionalism in the research process.

RESULTS AND DISCUSSIONS

In this section, the data gathered were further treated, presented, analyzed, and interpreted to focus on the study's specific objectives.

Table 1

Level of Learners' Arithmetic Performance of the Control Group in the Pretest and post-test

Group	N	Pretest		Post-test	
		Mean	Interpretation	Mean	Interpretation
Control Group	20	9.25	Low Level	13.30	Low Level

Table 1 presents the data on the arithmetic performance of the control group learners at the pretest and post-test levels. This study reveals that the control group's arithmetic performance level before undergoing the traditional lecture method was 9.25, which is interpreted as low. This implies that at this level, the learners struggled with the four fundamental operations, particularly involving two and three digits, as well as in word problems, and that their skills in this topic have not been adequately developed. This data was supported by Pan and Sana (2021), who reiterated that pretesting entails taking practice tests before learning information rather than after. This method is also known as erroneous creation or pre-questioning. Since the pretest contains information that learners still need to learn, it is not always possible

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

to ensure that they will perform well on the pretest. Because of this, it is still permissible for the learners to have low performance in the pretest.

On the other hand, the level of learners' arithmetic performance in the control group after undergoing the traditional lecture method increased to 13.30, still considered a low level. This implies that traditional lectures are effective in enhancing the arithmetic performance of learners when support resources are limited. It also indicates that the lecture method aids learners' understanding of the higher-order concepts of computing the four fundamental operations without additional exposure to other learning resources. The finding, supported by Alaagib et al. (2019), is that lecturing, whether effective or not, remains the most commonly used learning method, as it is an economical and practical approach, especially when the number of students is large and resources are limited.

Table 2

Level of Learners' Arithmetic Performance of the Experimental Group in the Pretest and post-test

Group	N	Pretest		post-test	
		Mean	Interpretation	Mean	Interpretation
Experimental Group	20	9.90	Low Level	15.85	Low Level

Table 2 presents the data on the learners' arithmetic performance in the experimental group at the pretest and post-test levels. The arithmetic performance level of the experimental group's learners before the intervention, using math apps on tablets, as reported in this study, was 9.90, indicating a low level. This implies that the learners have low arithmetic skills in four fundamental operations, suggesting that their skills on this topic have not been adequately developed.

On the other hand, the arithmetic performance of the learners in the experimental group after the intervention using math apps through tablets increased to 15.85, which is still considered a low level. It implies that the intervention was necessary and appropriate and aided the learners in improving their arithmetic skills in four fundamental operations. There was a substantial increase in their arithmetic performance after two months of intervention, indicating that Project IDEAL is effective. The results suggest that the intervention should be implemented for an extended period to maximize its effectiveness.

The result is supported by Villasoto (2024), who revealed that, before implementation, intermediate learners performed poorly in mathematics. Although there is an increase in scores after implementation, the results still show that intermediate learners performed poorly in mathematics. However, comparing these results to the pretest before the implementation of Project IDEAL reveals a significant improvement in the performance of intermediate learners. Likewise, Quilloy (2023) found significant improvement in learners' mathematics performance after the Math Game Apps intervention.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

Table 3

Comparative Analysis on the Level of Learners' Arithmetic Performance in the Pretest and post-test of the Control Group

Test	Mean	Degree of Freedom	t-value	Significant Level	P-value	Interpretation
Pretest	9.25	38	-3.010	0.05	0.005	Significant
Post Test	13.30	38				

Table 3 presents the inferential data to determine if there is a significant difference in the level of learners' arithmetic performance between the pretest and post-test of the control group. The mean value in the pretest of the control group was 9.25, and the mean value in the post-test of the control group was 13.30. The computed p-value was 0.005, which was below the 0.05 level of significance; thus, there is a significant difference in the levels of arithmetic performance in the pretest and post-test of the control group. Hence, the null hypothesis, which says that there is no significant difference between the levels of learners' arithmetic performance in the pretest and post-test of the control group, was rejected.

It implies that the traditional lecture is an effective strategy in improving learners' arithmetic performance. The continuous use of numeracy drills and exercises, flashcards, and board work had greatly improved learners' performance in four fundamental mathematical operations despite limited support resources. This suggests that even with minimal resources, consistent practice and interactive methods can significantly enhance learners' understanding and skills in basic math operations. Therefore, traditional teaching techniques remain valuable in fostering academic growth in arithmetic skills. The result, supported by Culpable et al. (2024), revealed that Project TABANG significantly improved mathematical skills using only its personalized and hands-on instructional approach. At the same time, Ismail and Maat (2020) demonstrated a significant improvement in students' performance and productivity, despite not having iPads for mathematics instruction.

Table 4

Comparative Analysis on the Level of Learners' Arithmetic Performance in the Pretest and post-test of the Experimental Group

Test	Mean	Degree of Freedom	t-value	Significant Level	P-value	Interpretation
Pretest	9.90	38	-3.649	0.05	0.001	Significant
Post Test	15.85	38				

Table 4 reveals the inferential data to find out if there is a significant difference in the level of learners' arithmetic performance in the pretest and post-test of the experimental group. The mean value in the pretest of the experimental group was 9.90, and the mean value in the post-test of the experimental group was 15.85. The computed p-value was 0.001, which was below the 0.05 level of significance; thus,

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

there is a significant difference in the levels of arithmetic performance in the pretest and post-test of the experimental group. Hence, the null hypothesis, which says that there is no significant difference between the levels of learners' arithmetic performance in the pretest and post-test of the experimental group, was rejected.

It implies that the use of math apps on tablets has had a significant effect on the arithmetic performance of learners. Most of the learners, especially those struggling with basic fundamental operations, enjoyed learning mathematics and felt motivated to strengthen their skills by using the tablets. In addition, many learners also gained an interest in exploring other math apps and games that could help improve their arithmetic skills. The results suggest that such focused interventions can be instrumental in assisting learners to overcome academic challenges and achieve better educational outcomes.

The finding, supported by Aspiranti and Larwin (2021), revealed that tablet-based math interventions provided moderate positive effects on student math gains. Uwineza et al. (2023) found that the Interactive Math software demonstrated greater performance than the traditional class, based on the effect size of significance and learning gains. Magtolis III (2023) revealed a significant difference in numeracy levels following the implementation of the Project Renrich intervention program. Moreover, Munda et al. (2024) revealed a significant difference between the pretest and post-test performances, thus confirming the effectiveness of the Project COUNT intervention program in strengthening students' numeracy skills.

Table 5

Comparative Analysis of the Level of Learners' Arithmetic Performance in the Pretest of the Control Group and the Experimental Group

Group	Mean	Degree of Freedom	t-value	Significant Level	P-value	Interpretation
Control Group	9.25	38	-0.476	0.05	0.637	Not Significant
Experimental Group	9.90	38				

Table 5 presents the inferential data to determine if there is a significant difference in the level of learners' arithmetic performance in the pretest of the control and experimental groups. The mean value of the control group was 9.25, and the mean value of the experimental group was 9.90. The computed p-value was 0.637, which was higher than the 0.05 level of significance, indicating that the difference in arithmetic performance levels between the pretest control and experimental groups is not statistically significant. The null hypothesis, which says that there is no significant difference between the levels of arithmetic performance in the pretest of the control and experimental groups, was accepted.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

The result implies that the arithmetic performances of the two groups before the intervention are statistically the same. This data also indicates that most learners, whether in the control or experimental group, exhibited similar low arithmetic performance. The initial arithmetic skill levels of the participants were comparable, highlighting a common challenge in their mathematical abilities. The finding supported by Smith (2024) reveals that only one skill on the baseline assessment is common to both groups, indicating a need for explicit skill instruction, multiple learning opportunities, and embedded practice in both special and general education settings.

Table 6

Comparative Analysis of the Level of Learners' Arithmetic Performance in the post-tests of the Control Group and the Experimental Group

Group	Mean	Degree of Freedom	t-value	Significant Level	P-value	Interpretation
Control Group	13.30	38	-1.581	0.05	0.122	Not Significant
Experimental Group	15.85	38				

Table 6 presents the inferential data to determine if there is a significant difference in the level of learners' arithmetic performance between the post-test of the control and experimental groups. The mean value of the control group was 13.30, and the mean value of the experimental group was 15.85. The computed p-value was 0.122, which was higher than the 0.05 level of significance. This indicates that the difference in arithmetic performance levels between the post-test of the control and experimental groups is not statistically significant. The null hypothesis, which says that there is no significant difference between the levels of arithmetic performance in the post-test of the control and experimental groups, was accepted.

The result implies that the use of tablets for mathematics instruction does not indicate a significant difference statistically through post-tests compared to the conventional lecture method. The experimental group obtained only a slightly higher mean score than the control group because, during the actual intervention, they had days without classes due to inclement weather and conflicts with institutional school activities. However, despite the circumstances, both methods of instruction are effective in improving learners' arithmetic performance. Traditional mathematics instruction, such as practicing drills, board work, and flashcards, remains a valuable strategy for improving learners' arithmetic performance. Using tablets with math apps and games not only enhances learners' arithmetic performance but also fosters enjoyment, motivation, and interest in mathematics. Additionally, integrating both traditional and technology-based methods could provide a more comprehensive approach to teaching mathematics.

The finding is supported by Ismail and Maat (2020), who revealed that the post-test results show no statistically significant difference between students who used iPads in learning activities and those who learned without iPads. Likewise, Barrientos (2021) showed that both the pedagogical design and the features of the math app design significantly improved the students' academic performance. Moreover, Kaur, Koval, and Chaney (2017) found that iPads, when used in conjunction with traditional teaching

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

methods, enhanced students' conceptual understanding of numbers and skills. The iPads and math apps kept the students engaged, focused, and motivated as they learned the skills being taught. Moreover, Masaganda and Limpiada (2023) found that the difference between the post-test scores of non-technology-based and technology-based instructions is not statistically significant.

Conclusion

The learners in the control group are struggling in four fundamental operations, indicating their arithmetic skills have not been adequately developed. The learners in the experimental group demonstrated low arithmetic skills in four fundamental operations, suggesting the need for continued exposure to Project IDEAL activities. There was an increase in learners' arithmetic performance in the control group, indicating that the traditional lecture method is effective in improving learners' performance. Additionally, there was a substantial improvement in learners' arithmetic performance in the experiment group, indicating that the Project IDEAL intervention is effective. Further, both the traditional method of instruction and the features of the math app design through tablets significantly improved the learners' arithmetic performance. To maximize its effectiveness, it is recommended that the intervention be continued for a longer period of time.

Acknowledgment

The researcher wishes to express profound gratitude to the people who extended their help in different ways and made this endeavor possible—her research adviser for expert assistance, patience, and support. The members of the oral defense panel provided the researcher with helpful criticisms, insights, suggestions, and recommendations, which contributed to the refinement of this work. To the researcher's respondents, thank you for giving your precious time and answering the test instrument to the best of your abilities. I also offer sincere appreciation and gratitude to those who, in one way or another, have contributed to the realization of this work. Above all, I thank the Divine Providence for always giving the Holy Spirit to enlighten the researcher.

Conflict of Interest

We maintain that none of the authors of this paper have a financial obligation or personal relationship with any person(s) or organizations that could inappropriately influence/bias the paper's content. We do not receive funding from any person(s) or organization to carry out this research. Given this, we specifically state that "No Competing interests are at stake and there is No Conflict of Interest" with any person(s) or organizations that could inappropriately influence/bias the content of the paper.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 12 (2025)

REFERENCES

Alaagib, N.A., Musa, O.A. & Saeed, A.M. (2019). Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan. *BMC Med Educ 19*, 365. https://doi.org/10.1186/s12909-019-1799-0

Ames, H., Glenton, C. & Lewin, S. (2019). Purposive sampling in a qualitative evidence synthesis: a worked example from a synthesis on parental perceptions of vaccination communication. *BMC Med Res Methodol 19*, 26. https://doi.org/10.1186/s12874-019-0665-4

Aspiranti, K. B. & Larwin, K. H. (2021). Investigating the effects of tablet-based math interventions: A meta-analysis. *International Journal of Technology in Education and Science (IJTES), 5*(4), 629-647. https://doi.org/10.46328/ijtes.266

Barrientos, I. G. (2021). The use of math apps and the mathematics performance of grade 8 students in new normal education. *EPRA International Journal of Research and Development (IJRD), 6*(7)

DOI: 10.36713/epra2016

Bobbitt, Z. (2021). *Matched pairs design: Definition + examples*. Statology. Retrieved December 22, 2025, from https://www.statology.org/matched-pairs-design/

Boz, S. (2024). Enhancing arithmetic skills through working memory: A review of interventions and strategies. Journal of Mathematics and Science Teacher, 4(3), em067. https://doi.org/10.29333/mathsciteacher/14632

Canilao, C. & Gurat, M. (2023). Effect of mobile apps on students' mathematics and technology attitude. *American Journal of Educational Research, 11*(10): 722-728. doi: 10.12691/education-11-10-11.

Culpable, C., Labrador, M., Rullan, A. & Delos Santos, M. (2024) Project tabang: a remediation in mathematics for learners at risk of failing. *Psych Educ*, *29*(2): 150-165 doi:10.5281/zenodo.14534776,

Igcasama, R., Kilag, O., Cabonilla, L., Abarias, C., Abendan, C. & Bubuli, A. 2023). Enhancing numeracy: a technological approach to improve basic math skills. *International Multidisciplinary Journal of Education, 1*(6)

Ismail, M. and Maat, S. (2020). The effects of iPad device on students' mathematics achievement. *International Journal of Novel Research in Education and Learning, 7*(2): 17-23. www.noveltyjournals.com

Kaur, D., Koval, A., & Chaney, H. (2017). Potential of using iPad as a supplement to teach math to students with learning disabilities. *International Journal of Research in Education and Science*, *3* (1), 114-121

Kurmaniak, N. (2021). *The development of numeracy skills in children*. https://study.com/academy/lesson/the-development-of-numeracy-skills-in-children.html

Magtolis III, D. (2023) Effectiveness of project re-enrich in improving the numeracy skills of grade 5 learners. *Psych Educ*, 2023, 9: 8-13 doi:10.5281/zenodo.7960684

Masaganda, C. & Limpiada, R. (2023). Utilization of technology-based instructional materials in developing the least learned competencies in mathematics of learners. *Psych Educ*, 2024, 29(2): 150-165 doi:10.5281/zenodo.14534776,

Munda, N.P., Endrinal, J.R.H. & Nequinto, M.C. (2024). Effectiveness of project COUNTS in improving students' numeracy skills. *International Journal of Science, Technology, Engineering and Mathematics*, 4 (1), 22-41. https://doi.org/10.53378/353038

Ondog, J., Kilag, O. K., Padilla, J., & Abendan, C. F. (2023). Understanding Numerical Intuition: An Analysis of Junior High School Students' Innate Mathematical Abilities and Number Sense Competencies. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(5), 391-402.

Pan, S. C., & Sana, F. (2021). Pretesting versus post-testing: Comparing the pedagogical benefits

of errorful generation and retrieval practice. *Journal of Experimental Psychology: Applied, 27*(2), 237–257. https://doi.org/10.1037/xap0000345

Quilloy, R. (2023). *Effectiveness of mathematics digital activities for learners' intervention game apps to the mathematics performance of learners.* https://ssrn.com/abstract=4570177

Rogers, J. & Revesz, A. (2019). *Experimental and quasi-experimental designs.* The Routledge Handbook of Research Methods in Applied Linguistics. (pp. 133-143). Routledge: London, UK

Saini, M., Sengupta, E., Singh, M., Singh, H., & Singh, J. (2023). Sustainable Development Goal for Quality Education (SDG 4): A study on SDG 4 to extract the pattern of association among the indicators of SDG 4 employing a genetic algorithm. *Education and Information Technologies, 28(*2), 2031–2069. https://doi.org/10.1007/s10639-022-11265

Smith, P. (2024). *The numeracy intervention projects*. Published Capstone Projects. Northwestern College, Iowa

Uwineza, I., Uworwabayeho, A. & Yokoyama, K. (2023). Effects of interactive mathematics software on grade 5 learners' performance. *International Journal of Learning, Teaching and Educational Research, 22*(1); 166-190. https://doi.org/10.26803/ijlter.22.1.10

Villasoto, D. (2024). Mathematics performance of intermediate learners through project ways. *Psych Educ*, 2024, 21(7): 755-760, doi:10.5281/zenodo.12640502,