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Computational Efficiency And Conceptual Understanding in Mathematics Among Grade 7 Students in Bernardo Lirio MNHS Sy 2025 – 2026

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Abstract

This study investigated the effects of calculator integration on the computational efficiency and conceptual understanding of Grade 7 mathematics students at Bernardo Lirio Memorial National High School during the school year 2025–2026. The study viewed calculators as cognitive tools rather than mere computational devices, addressing the gap between students' procedural skills and conceptual understanding. It aimed to reduce tedious manual computations, lessen cognitive load, and allow students to focus more on problem-solving strategies and mathematical relationships.

A quantitative research design was employed involving 50 randomly selected Grade 7 students, consisting of 26 males and 24 females. Data were gathered through a 30-item timed written pre-test and post-test, along with a 5-item conceptual problem-solving test evaluated using a scoring rubric to measure computational efficiency and conceptual understanding. A validated researcher-made survey questionnaire was also administered to identify the practical and cognitive challenges students encountered when using calculators.

The findings revealed that most students were initially classified as non-numerate in basic competencies, indicating a low level of mathematical proficiency during the pre-test. However, significant improvement was observed after calculator integration. Specifically, 54% of students achieved an above-average numerate level in integer operations, while many attained advanced performances in simplifying complex numerical expressions and applying the order of operations.

Despite these improvements, students reported several challenges, including inconsistent access to similar calculators used during instruction, concerns about overdependence on calculators, and difficulty identifying input errors during computation.

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https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

The study concluded that the intentional integration of calculators in Grade 7 mathematics significantly improves students' computational efficiency, conceptual understanding, and classroom engagement. It recommends expanding calculator integration to other mathematics subjects, providing teachers with technology-focused pedagogical training, and ensuring schools maintain adequate and reliable access to calculators and related learning resources.

Keywords:*computational efficiency, conceptual understanding, calculator integration, mathematics*

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https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

1. Introduction

Mathematics plays a vital role in developing learners' logical thinking, analytical reasoning, and problem-solving skills. In today's technology-driven society, integrating digital tools into classroom instruction has become increasingly important in promoting meaningful and efficient learning. One technological tool commonly used in mathematics is the calculator, which can function not only as a computational device but also as a cognitive tool that enhances mathematical reasoning and conceptual understanding. Within the K–12 curriculum, particularly in junior high school, calculator integration may help students reduce tedious manual computations and focus more on exploring mathematical concepts, relationships, and problem-solving strategies. This study aimed to determine how the effective integration of calculators strengthens the computational efficiency and conceptual understanding of Grade 7 mathematics students while supporting 21st-century learning competencies such as critical thinking, problem-solving, and digital literacy.

Despite the importance of mathematics education, many students continue to struggle with both computational efficiency and conceptual understanding. Studies and classroom observations revealed that while learners are often capable of performing manual computations, they frequently fail to connect procedures with the underlying mathematical concepts. Teachers observed that excessive reliance on lengthy manual calculations often leads to cognitive overload, reducing opportunities for reflection, conceptual exploration, and higher-order reasoning. The overemphasis on procedural computation has also been associated with low mathematics performance and increased math anxiety among students. As a result, many Grade 7 learners rely heavily on rote memorization and are prone to basic arithmetic errors that hinder deeper mathematical understanding.

International and national assessments further highlight the urgency of improving mathematics instruction in the Philippines. Reports from the Department of Education (DepEd), the Trends in International Mathematics and Science Study (TIMSS), and the Programme for International Student Assessment (PISA) consistently showed that Filipino learners performed below international averages in mathematics, particularly in number sense, operations, problem-solving, and conceptual understanding. These findings indicate persistent gaps in foundational mathematics skills and reveal the need for innovative instructional approaches that can strengthen both procedural fluency and conceptual comprehension among learners.

Recent studies emphasized that the effective use of calculators can improve learner performance by allowing more instructional time for conceptual discussion, mathematical modelling, and problem-solving activities. However, researchers also stressed that calculator integration should be guided by proper teacher support, curriculum alignment, and balanced instructional practices to ensure calculators serve as cognitive tools rather than learning crutches. Given the increasing relevance of digital literacy and the Philippines' continuing challenges in mathematics achievement, conducting research on calculator integration among Grade 7 students is essential. The findings of this study may provide valuable evidence for educators and policymakers in designing instructional strategies and policies that promote both computational accuracy and deeper conceptual understanding in mathematics.

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https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

Statement of the problem

To effectively extract relevant results, the study sought to answer the following questions.

1. What is the current level of Grade 7 students' computational efficiency and conceptual understanding as measured through a written test and a conceptual test?

2. How effective is the Grade 7 students in terms of:
   2.1 operation of integers
   2.2order of operations; and
   2.3simplifying numerical expressions

3. How is the students' problem-solving performance manifested when calculators are integrated into the lessons?

4. What challenges do students encounter in using calculators as a tool in learning Mathematics?

5. Based on the analysis of the study, what enhancement activities may be proposed?

Objectives

1. Determine the current level of Grade 7 students' computational efficiency and conceptual understanding as measured through a written test and a conceptual test.

2. Measure the effectiveness of the Grade 7 students in terms of:
   2.1 operation of integers
   2.2order of operations; and
   2.3simplifying numerical expressions

3. Determine the students' problem-solving performance when calculators are integrated into the lessons.

4. Identify the challenges students encounter in using calculators as a tool in learning Mathematics.

5. Propose enhancement activities based on the analysis of the study to further improve the students' computational efficiency and conceptual understanding in Mathematics.

2. Materials and Methods

- **Research Design**

  In this study, the researcher employed quantitative research, which involves the systematic collection and analysis of numerical data and addresses the research question

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Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

or hypothesis. This design utilizes objective, structured, and rigorous procedures to generate reliable information. The processes followed are clearly documented and transparently presented to ensure that other researchers may replicate and validate the study's methodology and findings.

- **Participants**:

  The researcher selected 26 male students and 24 female students from Grade 7–Generosity of Bernardo Lirio Memorial NHS. Grade 7 students were chosen as participants because they are typically in the transition period from elementary mathematics to more advanced secondary-level concepts such as rational numbers, integers, ratio and proportion, algebraic expressions, linear equations, and introductory geometry. This developmental stage is marked by increasing cognitive demands, including the need to understand abstract representations, perform multi-step computations, and engage in problem-solving and reasoning tasks. All students answered both the standardized numeracy test and the researcher-made questionnaire.

- **Instruments**:

  For the instruments, the researcher utilized the timed written test and conceptual test to determine the performance of the students and a self-made questionnaire to analyze the use of calculator learning tools in the mathematics class. A simple random sampling method will be used to determine the respondents. It involves randomly selecting items without any specific pattern or criteria, which is an unbiased, purely random selection of individuals from the population, where each member has an equal chance of being included.

- **Procedure:**

  To achieve the objectives of the study, the researcher secured permission from the school principal of Bernardo Lirio Memorial National High School through a formal letter of request. After approval, the researcher explained the purpose and procedures of the study to the participants. Parental consent forms and student assent forms were distributed and collected prior to the administration of the tests to ensure voluntary participation. The researcher then administered the pre-test, followed by the integration of calculators during the instructional period. After the intervention, the post-test and survey questionnaire were conducted to assess students' competencies and experiences regarding calculator integration in mathematics lessons. All collected data were tallied, tabulated, and subjected to statistical analysis with the assistance of a statistician to ensure accuracy in computation and interpretation. To protect participants' privacy and confidentiality, all gathered information was handled in accordance with Republic Act No. 10173 or the Data Privacy Act, and the data were used solely for research purposes to support the improvement of the teaching and learning process.

- **Data Analysis**

  The following statistical tools were utilized to analyze and quantify the data gathered in the study. Composite mean was used to determine the overall average of the

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Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

weighted means in the questionnaire regarding the challenges students encountered in using calculators as a tool in learning Mathematics. Frequency was employed to identify the number of participants categorized as above average numerate, average numerate, emergent, and non-numerate based on their standardized test scores, as well as the total number of respondents who answered the test and questionnaire. Percentage was used to determine the proportion of students under each numeracy category in Mathematics 7. Ranking was utilized to identify the positional results of the participants' responses based on the tallied data, while weighted mean was used to determine the average responses of students regarding calculator integration in Mathematics classes in terms of learning content, learning activities, and assessment tasks.

3. Results

1. The current level of Grade 7 students' computational efficiency and conceptual understanding as measured through a written test and a conceptual test

Table 1
Current Level of Grade 7 Students' Computational Efficiency and Conceptual Understanding in the Pretest

Score Range	Verbal Interpretation	Frequency	Percentage	Rank
24 – 30	Above Average Numerate	6	12	4
16 – 23	Average Numerate	16	32	1
9 – 15	Emergent	13	26	3
0 – 8	Non-numerate	15	30	2
	TOTAL	50	100	

It can be seen from the table that out of 50 students, 16, or 32 percent, were average numerates, which ranked first. 30 percent, or 15 students, ranked second, which was under the non-numerates. On the other hand, 13 students who were classified as emergent got an equivalent of 26 percent, making them third in the ranking. Lastly, only six students, or 12 percent of the total, had above-average numeracy, ranking fourth.

Based on the findings, it can be concluded that students lack the skills in performing operations of integers, the order of operations, and simplifying numerical expressions. The low performance of the students indicates that the teacher needs to use a teaching style that would help the students attain the learning competencies for the mentioned lessons.

2. The effectiveness of the integration of calculators on the computational efficiency and conceptual understanding of Grade 7 students

Table 2
Performance Level in the Operation of Integers with Calculator Integration

Score Range	Verbal Interpretation	Frequency	Percentage	Rank
24 – 30	Above Average Numerate	27	54	1

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

16 – 23	Average Numerate	13	26	2
9 – 15	Emergent	4	8	4
0 – 8	Non-numerate	6	12	3
	TOTAL	50	100	

The table reveals a high level of proficiency among the participants. Out of 50 students, 27, or 54 percent, achieved a score within the 24–30 range, earning a verbal interpretation of above average numerate. This category ranked first, followed by average numeracy at 26 percent. Only a small fraction, or 12 percent, were classified as non-numerate, while 4 out of 50 students, or 8 percent, ranked fourth.

Table 3
Computational Efficiency in the Order of Operations

Score Range	Verbal Interpretation	Frequency	Percentage	Rank
24 – 30	Above Average Numerate	26	52	1
16 – 23	Average Numerate	17	34	2
9 – 15	Emergent	6	12	3
0 – 8	Non-numerate	1	2	4
	TOTAL	50	100	

The table demonstrates a similar trend of high achievement. 26 out of 50 students, or 52 percent, were classified as above average numerate, which has a score range from 24–30, and another 34 percent, or 17 students out of 50, fell into the average numerate category. Notably, only 2 percent of the students remained at the non-numerate level.

Table 4
Computational Understanding in Simplifying Numerical Expressions

Score Range	Verbal Interpretation	Frequency	Percentage	Rank
16 - 20	Advanced	17	34	1
12 – 15	Proficient	13	26	2
8 – 11	Approaching Proficiency	12	24	3
0 – 7	Beginning	8	16	4
	TOTAL	50	100	

The table shows the performance level of grade 7 students in simplifying numerical expressions that utilize a different set of verbal interpretations to measure mastery. Most scores range from 16 to 20, where 17 out of 50 students, or 34 percent, achieved the advanced level. Additionally, 26 percent, or 13 students, were proficient. On the other hand, 12 students who were classified as approaching proficiency got an equivalent of 24 percent, making them third in the ranking. Lastly, only 8 students, or 16 percent of the total, were classified as beginning, ranking fourth.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

3. Students' problem-solving performance manifested when calculators were integrated into the lessons

Table 5
Problem-Solving Performance with Calculator Integration

Verbal Interpretation	Frequency	Weight	Weighted Score
Above Average Numerate	27	4	108
Average Numerate	13	3	39
Emergent	4	2	8
Non-numerate	6	1	6
TOTAL	50		161
WEIGHTED MEAN:	**3.22**		

The computed weighted mean of 3.22, interpreted as Above Average Numerate, indicates that students demonstrated strong problem-solving performance when calculators were integrated into the lessons. The findings revealed that 54% of the students were categorized as Above Average Numerate, showing that most learners were able to apply mathematical concepts and methods effectively in solving problems. This suggests that calculator integration helped students perform calculations more quickly and accurately, allowing them to focus more on understanding and analyzing problems rather than on lengthy computations. In contrast, only 8% of students were classified as emergent and 12% as non-numerate, indicating that few learners experienced difficulty with the activities. The results support previous studies emphasizing the benefits of calculator use in mathematics instruction, particularly in improving problem-solving skills and reducing computational errors. Overall, the weighted mean of 3.22 confirms that calculators, when properly integrated into instruction, serve as effective learning tools that enhance computational efficiency, conceptual understanding, and higher levels of mathematical achievement.

4. Challenges students encounter in using calculators as a tool in learning Mathematics

Table 6
Challenges in Calculator Skills and Usage

I…	Weighted Mean	Verbal Interpretation	Rank
1. find it difficult to operate a scientific calculator	2.74	Agree	1
2. am not familiar with most of the calculator functions used in math class	2.54	Agree	5
3. sometimes press the wrong buttons because I do not fully understand the	2.56	Agree	4

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Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

calculator layout			
4. feel unsure if the answers shown on the calculator are correct	2.42	Disagree	7
5. find it challenging to switch between manual computation and calculator use	2.68	Agree	3
6. often need help from a classmate or teacher to use the calculator properly	2.52	Agree	6
7. worry that I might depend too much on the calculator if I use it often	2.72	Agree	2
Composite Mean	**2.60**	**Agree**	

The composite mean of 2.60, interpreted as Agree, indicates that students generally experience challenges in using calculators despite their benefits in learning Mathematics. The most significant difficulties identified were operating a scientific calculator, which obtained the highest weighted mean of 2.74, and concerns about becoming overly dependent on calculators, with a weighted mean of 2.72. Students also experienced difficulty balancing manual computation with calculator use, reflected by a weighted mean of 2.68, indicating challenges in integrating both skills effectively. Meanwhile, confusion regarding the accuracy of calculator answers received the lowest weighted mean of 2.42, suggesting that students generally trust calculator outputs, although this may also indicate limited critical evaluation of the results provided by the technology.

These results corroborated the notion that while calculators improve problem-solving abilities, students' familiarity and proficiency levels affect how helpful they are. Students who are not properly educated to use calculators may experience cognitive overload, which can impede rather than facilitate learning. Additionally, research highlighted that in order to fully reap the benefits of calculator use, children must get adequate education in both procedural fluency and conceptual understanding.

Table 7
Challenges in Access and Availability

I…	Weighted Mean	Verbal Interpretation	Rank
1. do not always have access to a scientific calculator during mathematics classes	2.58	Agree	4
2. find it difficult to use a calculator because I do not own one	1.92	Disagree	6
3. find it hard to follow lessons when I	2.76	Agree	2

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

	have to share a calculator with my classmates			
4.	feel that my ability to practice is limited by the lack of available calculators in school.	2.72	Agree	3
5.	cannot use a calculator during some lessons or activities, even when I need one	2.40	Disagree	5
6.	find it challenging when the calculator I use is different from the one used in class demonstrations	2.80	Agree	1
	Composite Mean	**2.53**	**Agree**	

The composite mean of 2.53, interpreted as Agree, indicates that access and availability issues are significant challenges among students in using calculators. The most prominent concern was the difficulty experienced when the calculator used differed from the one demonstrated in class, which obtained the highest weighted mean of 2.80. This was followed by difficulty in following lessons when sharing a calculator, with a weighted mean of 2.76, highlighting how limited resources negatively affect students' engagement and learning. Students also reported that insufficient access to calculators limited their opportunities to practice, reflected by a weighted mean of 2.72, emphasizing the importance of consistent availability for skill development. Meanwhile, the statement regarding difficulty using a calculator because of not owning one received the lowest weighted mean of 1.92, suggesting that the primary concern lies not in ownership itself but in the consistent availability and uniformity of calculators used in the classroom.

Table 8
Challenges in Learning and Understanding

I…		Weighted Mean	Verbal Interpretation	Rank
1.	am sometimes confused by using a calculator instead of being helped to understand the lesson	2.86	Agree	3
2.	find it harder to understand mathematical concepts when I depend on the calculator too much	2.76	Agree	4
3.	struggle to connect calculator results	2.62	Agree	7

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

with the mathematical steps behind them			
4. feel that calculator use sometimes makes me skip important steps needed to understand the topic	2.94	Agree	2
5. get confused when the calculator's answer does not match my manual solution	2.98	Agree	1
6. find it difficult to remember procedures when I rely on the calculator	2.74	Agree	5
7. find that calculator use occasionally distracts me from understanding the lesson	2.64	Agree	6
Composite Mean	**2.80**	**Agree**	

The composite mean of 2.80, interpreted as Agree, indicates that students experience significant difficulties in connecting conceptual understanding with calculator use. The highest challenges identified were confusion when calculator answers did not match manual solutions, which obtained the highest weighted mean of 2.98, and skipping important steps needed to understand the lesson, with a weighted mean of 2.94. These findings suggest that students may rely heavily on calculators without fully understanding the mathematical processes involved, leading to confusion when inconsistencies arise. Students also reported confusion caused by using calculators instead of understanding the lesson, with a weighted mean of 2.86, and difficulty grasping concepts due to overdependence on calculators, which received a weighted mean of 2.76. Moreover, learners experienced challenges in recalling procedures, reflected by a weighted mean of 2.74, and in relating calculator results to mathematical steps, with a weighted mean of 2.62, indicating that excessive reliance on calculators may hinder deeper conceptual learning.

Table 9
Challenges in Computation and Accuracy

I…	Weighted Mean	Verbal Interpretation	Rank
1. find it difficult to identify whether I made a mistake in entering values into the calculator	2.84	Agree	1
2. sometimes forget basic math facts when I rely too heavily on the calculator	2.60	Agree	2

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

3. make errors because I do not know how to use certain functions (e.g., parentheses, exponents)	2.42	Disagree	5
4. find that using the calculator sometimes slows me down instead of helping me work faster	2.54	Agree	4
5. struggle to solve complex problems even with a calculator.	2.58	Agree	3
Composite Mean	**2.60**	**Agree**	

The overall composite mean of 2.60, interpreted as Agree, indicates that students commonly encounter difficulties when using calculators in learning Mathematics. The most significant challenge identified was difficulty determining whether values were entered incorrectly into the calculator, which obtained the highest weighted mean of 2.84, suggesting that students tend to rely heavily on calculator outputs without verifying the accuracy of their inputs. This was followed by forgetting basic mathematical facts due to excessive dependence on calculators, with a weighted mean of 2.60, indicating that overreliance may weaken fundamental mathematical skills. Students also reported difficulty solving complex problems even when using calculators, reflected by a weighted mean of 2.58, showing that conceptual understanding remains a challenge. In addition, students agreed that calculators sometimes slowed them down rather than improved efficiency, which received a weighted mean of 2.54, implying limited familiarity with calculator functions. Meanwhile, the least-cited difficulty was making mistakes due to unfamiliarity with specific functions such as parentheses and exponents, which obtained a weighted mean of 2.42 and was interpreted as Disagree, suggesting that students were relatively comfortable using basic calculator functions compared to other challenges.

Table 10
Challenges Related to Confidence and Anxiety

I…	**Weighted Mean**	**Verbal Interpretation**	**Rank**
1. feel nervous when using the calculator during quizzes or tests	2.20	Disagree	4
2. am afraid that I might get different answers when I use the calculator	2.76	Agree	1
3. feel less confident in solving math problems when the calculator is required	2.14	Disagree	5
4. worry that I may become too dependent on calculators in the future	2.56	Agree	2

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

5. feel anxious when the teacher asks us to use calculator functions that I am not familiar with	2.32	Disagree	3
Composite Mean	**2.40**	**Disagree**	

A more detailed analysis of the data revealed the specific areas in which students experienced the greatest hesitation in using calculators. The statement "I am afraid that I might get different answers when I use the calculator" obtained the highest weighted mean of 2.76, interpreted as Agree, indicating that students still have concerns about the accuracy of their inputs and the calculator's handling of mathematical operations. The second-highest indicator, "I worry that I may become too dependent on calculators in the future," received a weighted mean of 2.56, showing that students are aware of the possible negative effects of excessive reliance on calculators, particularly on their independent thinking and mental arithmetic skills. Overdependence on calculators and computational applications may weaken students' foundational understanding of mathematics over time. On the other hand, students generally disagreed that calculators reduced their confidence or caused academic stress. The statement "I feel less confident in solving math problems when the calculator is required" received the lowest ranking, while students also disagreed with feeling anxious during high-stakes tests or when learning new calculator functions, suggesting that calculator use does not significantly affect their confidence or anxiety levels in mathematics.

5. Proposed Enhancement Activity

Calculator integration is essential to improving pupils' conceptual comprehension and computational efficiency. Calculators are useful tools that ease the stress of lengthy computations as mathematical assignments become more difficult, freeing up learners to concentrate on problem-solving techniques and the underlying concepts. Students can devote more mental energy to relationship analysis, result interpretation, and strategy development by reducing errors in manual computations. As a result, using calculators enhances speed and accuracy while also encouraging a deeper understanding of mathematical concepts, which eventually leads to better scholastic achievement.

The successful integration of digital instruments, like calculators, revolutionizes the teaching and learning of mathematics. It highlights how technology allows students to investigate mathematical ideas in a dynamic way, encouraging critical thinking and active learning. Calculators enhance learning by giving students the chance to test hypotheses, see patterns, and confirm answers rather than taking the place of conventional techniques. The development of procedural fluency and conceptual understanding are the two crucial elements of mathematical competency which is supported by this combination.

Discussion

The findings of the study revealed that the integration of calculators significantly improved the computational efficiency, conceptual understanding, and problem-solving

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

performance of Grade 7 students in Mathematics. Most students demonstrated higher performance levels in the operation of integers, order of operations, and simplifying numerical expressions after the integration of calculators in classroom instruction. The results further showed that calculator use helped students perform calculations more efficiently, allowing them to focus more on understanding mathematical concepts and solving problems accurately.

Despite these positive outcomes, students also encountered several challenges related to calculator skills, accessibility, conceptual understanding, computation accuracy, and concerns about overdependence on calculators. Nevertheless, the overall findings suggest that when properly guided and effectively integrated into instruction, calculators serve as valuable learning tools that enhance students' mathematical performance, engagement, and conceptual learning.

Moreover, the operation of integers serves as the fundamental building block for secondary mathematics, introducing students to the concept of directed numbers. Unlike whole number arithmetic, working with integers requires students to manage both magnitude and sign, which are positive and negative, which often necessitates a shift from concrete to abstract reasoning. The integration of calculators in this category is designed to bridge the gap for students who struggle with the cognitive load of sign-switching rules. By ensuring accuracy in basic computations, calculators allow learners to focus on the conceptual logic of how values move across the number line.

Additionally, the integration of calculators helps students visualize the sequence of mathematical steps. Mainali (2021) suggests that when students use calculators to verify the order of operations, they develop a more robust conceptual framework for how different operations interact. It shifts the focus from doing the math to managing the process.

Also, the mastery of the order of operations requires a clear understanding of mathematical hierarchy. The results indicate that using calculators allows students to verify their steps in real-time, facilitating a transition from rote memorization of rules to a deeper process management. The high percentage of numerate students supports the idea that calculators serve as a checking mechanism that reinforces the correct sequence of operations. Mainali (2021) emphasizes that when students use digital tools to represent and verify mathematical structures, they develop a more robust conceptual framework, as the tool provides immediate feedback on the validity of their sequential logic.

On the other hand, a 2023 meta-synthesis found that calculators are useful instruments for raising pupils' cognitive performance, problem-solving abilities, and general mathematics comprehension. The study also highlighted how calculators assist pupils in better representing and analyzing mathematical concepts, which raises performance levels.

Furthermore, studies on the use of technology in mathematics indicate that calculators lessen cognitive burden by managing repetitive computations, allowing pupils to devote more mental energy to reasoning and problem-solving techniques. Students are therefore more adept at developing methods, interpreting findings, and verifying solutions, which are all crucial aspects of mathematical competency.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

It highlights that the use of technology in classrooms can significantly enhance learning outcomes when implemented appropriately. The study emphasizes how digital tools, such as calculators, can enhance student engagement and enable individualized learning experiences. It also emphasizes that appropriate guiding and educational practices are necessary for these tools to be effective. Calculator integration can benefit different learners, close comprehension gaps, and encourage meaningful mathematical learning when utilized carefully.

5. Conclusion

The study concludes that the integration of calculators in Grade 7 Mathematics instruction proved to be effective in enhancing students' computational efficiency, conceptual understanding, and problem-solving performance. The results showed that students demonstrated improved performance in the operation of integers, order of operations, and simplifying numerical expressions when calculators were used as learning tools. Calculator integration enabled learners to perform computations more accurately and efficiently, allowing them to focus more on understanding mathematical concepts and applying appropriate problem-solving strategies.

The study also revealed that calculators positively contributed to students' engagement and confidence in Mathematics. However, several challenges were identified, including difficulties in operating scientific calculators, inconsistent access to calculators, overdependence on technology, and struggles in connecting calculator outputs with underlying mathematical concepts. These findings indicate that while calculators are beneficial instructional tools, their effectiveness depends on proper guidance, balanced integration, and sufficient access to resources.

Therefore, the study concludes that calculators, when appropriately integrated into mathematics instruction, serve as valuable cognitive tools that support meaningful learning and improved mathematical achievement. The findings further emphasize the importance of teacher guidance, adequate training, and consistent access to calculators to ensure that technology enhances rather than replaces students' conceptual understanding and critical thinking skills in Mathematics.

Recommendations

In light of the results yielded, it is recommended that the following will be considered.

1. Integration of the calculator may be used in other lessons in mathematics and in lower learning competencies to give students advanced knowledge in the lessons.

2. An in-service training workshop for teachers' capability building may be conducted to develop their skills in using technological strategies in teaching.

3. The utilization of calculator learning tools may be continued in the next school year for a higher level of performance among students.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal
of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 7 (2026)

4. More learning activities may be provided that cover all the lessons for the fourth quarter.

5. Similar studies with an in-depth and wider scope may be conducted to validate and confirm the findings obtained in the study.

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