Utilization of Mathscore and Mathematics Achievement of Grade 10 Students of Blessed Christian School de Sta. Rosa, Inc. in Sta. Rosa, Laguna

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Abstract
In the swiftly evolving landscape of the 21st century, technology emerged as a transformative force, reshaping myriad aspects of our lives. One of the domains that witnessed revolutionary transformation was EDUCATION. Technology, with its diverse applications, significantly enhanced the education system, offering an array of benefits that contributed to a more effective and engaging learning environment.
The integration of technology in education paved the way for innovative avenues to engage students in the learning process. Particularly, online games showed tremendous promise, especially in teaching mathematics. For students inclined towards online gaming, leveraging technology to gamify mathematics not only captured their interest but also fostered a deeper understanding of mathematical concepts. As Scharaldi (2020) noted, with its vibrant and interactive media, technology offered dynamic choices for math instruction, improving the process of learning and bringing concepts to life. Additionally, it provided individualized learning experiences and extra support to meet the requirements of every student. However, despite numerous studies on the utilization of the Mathscore program and mathematics achievement, no study had yet been conducted specifically in the City of Sta. Rosa, Laguna, regarding the utilization of the Mathscore Program and the Mathematics Achievement of Grade 10 students at Blessed Christian School de Sta. Rosa, Inc.
The researcher investigated the relationship between the utilization of the Mathscore program and the mathematics achievement of Grade 10 students at Blessed Christian School de Sta. Rosa. This study employed a descriptive-correlational method of research, using survey questionnaires as the main source of data.
The study revealed that there was no correlation between the utilization of Mathscore and the mathematics achievement of Grade 10 students, even though there was a high level of utilization of Mathscore, and respondents believed that the program helped them enhance and master their math skills. Furthermore, it also showed that students spent a low amount of time using Mathscore and faced difficulties in understanding the instructions. Thus, an action plan was developed to enhance students' performance in Mathscore, which aimed to contribute to their mathematics achievement.

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Keywords: Mathscore, Utilization of Mathscore, Mathematics Achievement

1. Introduction

In the swiftly evolving landscape of the 21st century, technology has emerged as a transformative force, reshaping myriad aspects of our lives. One of the domains witnessing revolutionary transformation is education. Technology, with its diverse applications, has significantly enhanced the education system, offering an array of benefits that contribute to a more effective and engaging learning environment.

Integration of technology in education has paved the way for innovative avenues to engage students in the learning process. Particularly, online games have shown tremendous promise, especially in the teaching of mathematics. For students inclined

towards online gaming, leveraging technology to gamify mathematics not only captures their interest but also fosters a deeper understanding of mathematical concepts. As Scharaldi (2020) [14] notes, Technology enabled dynamic math instruction by boosting the learning process and bringing concepts to life through engaging and interactive media. Along with individualized learning experiences, it also provided extra support to fulfill the requirements of every student. Furthermore, Online web-based education provides learners with unprecedented access to educational content, far exceeding the reach of traditional classrooms. It provides open, dynamic, and dispersed experiential learning, increasing training engagement, participation, and efficiency.

Achievement in mathematics involves more than just honing critical thinking or basic computation skills. MathScore ensures a well-rounded approach by striking a delicate balance between these abilities, presenting them in a thoughtful sequence. Rather than hastily doling out awards, as some competing programs do for minimal accomplishments, MathScore prioritizes substantial learning. The program begins by fostering a robust conceptual understanding, followed by computation practice, and ultimately reinforcement through word problems for foundational skills.

In contrast to many programs, MathScore's recognition system is stringent. Earning a MathScore trophy is no easy feat, and this deliberate difficulty is deemed beneficial. Analogous to the challenges in real computer games where trophies are hard-earned for achieving something exceptional, MathScore trophies are only attainable after mastering a cohesive set of math skills necessary for Trigonometry an or Algebra I proficiency. This includes skills such as math facts, fractions, and negative numbers. Students, upon seeing the trophies and their associated requirements, are prompted to set mental goals for themselves. This goal-oriented mindset, coupled with a focus on critical skill development, often leads to notable improvements in test scores. Mathematical Achievement is the competency shown by the student in the subject mathematics. Its measure is the score on an achievement test in mathematics (Cerbito, 2023) [5].

This tool actively involves students in exploring mathematics, enhancing their understanding of mathematical concepts, and honing their skills. According to information from Mathscore.com, the program aims to establish a relatable understanding at the definition level, employing visual aids to help learners grasp the essential meaning of concepts like addition or fractions; achieve computational excellence through adaptive strategies, effectively assisting students in mastering arithmetic facts by selectively refining specific subsets of math facts; and enhance analytical comprehension by encouraging the application of concepts in real-life situations, which becomes feasible after students have acquired a strong grasp of definitions and superior computational abilities. This analytical skill development is often fostered through solving word problems or interpreting graphs.

Furthermore, mathematics achievement is the variable that shows that learning has taken place because it reveals the degree of success or failure of arithmetic learners. Age (2023) [4] defines achievement as a thing that somebody has done successfully, especially using their own efforts and skills. In support of this notion, it is also stated that academic achievement depicts students' achievement on a standard of measurements, such as achievement test, skill test, and analytical thinking test.

However, despite numerous studies on the utilization of the Mathscore Program and Mathematics Achievement, no study had yet been conducted specifically in the City of Santa Rosa, Laguna, regarding the utilization of the Mathscore Program and the Mathematics Achievement of Grade 10 students at Blessed Christian School de Sta. Rosa, Inc. Additionally, the school had been using the application for five years, making it beneficial for the institution to conduct this study to determine whether the Mathscore Program significantly helped students in learning math concepts and contributed to higher grades in mathematics.

Thus, the researcher aimed to investigate the relationship between the utilization of the Mathscore Program and the Mathematics Achievement of Grade 10 students at Blessed Christian School de Sta. Rosa, Inc.

2. Method

This study employed a descriptive-correlational research method, utilizing survey questionnaires as the primary data source. Statistical methods were applied to ensure the credibility and reliability of the findings. In this approach, information was gathered without altering the environment (i.e., no variables were manipulated). It aimed to obtain information about the current status of a phenomenon, describing "what exists" concerning specific variables or conditions. The procedure for this study is as follows:

2.1 Problem formulation

The study determined the relationship between the utilization of Mathscore and the mathematics achievement of Grade 10 students of Blessed Christian School De Sta. Rosa, Inc.

In particular, it looked for solutions to the following issues:

1. What is the demographic profile of the Grade 10 students in terms of:
   - sex,
   - monthly family income,
   - hours spent in using Mathscore per week, and
2. What is the students' level of utilization of Mathscore?
3. What is the students' level of mathematics achievement during the 1st Quarter General Average in Mathematics?
4. Is there a significant difference in the students' level of utilization of Mathscore when grouped according to profile?
5. Is there a significant difference in the students' level of academic achievement when grouped according to profile?
6. Is there a significant relationship between students' level of utilization of Mathscore and their level of academic achievement?
7. What action plan may be proposed based on the findings?

2.2 Related Literature

Abykanova *et al*. (2016) [2] and Elsayari (2022) sudied on the use of Interactive learning technology is related to the study of Sharaldi and Huang *et al*. (2020) all studies were about integration of interactive learning tools inside the classroom and with a harmonious combination with traditional teaching can result to an effective learning

process and boost students' progress. Additionally, Scharaldi (2020) [14] On her blog, she addressed the benefits of using technology to teach mathematics. He added that, according to Jo Boaler and the team at Standford Graudate School of Education, visual representation of all mathematical concepts, as well as visual activities at all grade levels, can considerably benefit children. Technology expands learners' opportunities to see and interact with mathematical concepts. Games, simulations, and digital tools enable students to explore and learn.

In addition, Adachi *et al*. (2019) Sabriva, Fedorova, Sandalova and Rajeshkannan, and Ambedkar (2019) [11] research results those students perceived interactive tool moe interesting and engaging tham traditional textbooks. Selimi *et al*. (2020), Shana *et al*. (2023) [17], and Ulfa *et al*. (2021) all their research studies aim to assess the effects of web-based mathematical learning to students. The results of their studies show that web-based tools or softwares for mathematics that were used helps in students' engagement and interaction during the time of mathematics and the result has a positive significant effect to the mathematical achievements of the students. The students also found that it is easy and fun to learn creatively while using interactive application in their lesson. In the same way this kind of tool become the new trend in teaching and learning process. Thus, Li *et al*. (2020) and Prast *et al*. (2018) highlights in their studies that cooperative learning and motivation which are factors in increase of mathematical performance

Moreover, Yahiaoui, *et al*. (2022) [21] studied The Impact of e-Learning Systems on Motivating Students and Enhancing Their Outcomes During COVID-19: A Mixed-Method Approach. This study presented how useful e-learning systems during pandemic. It gives new and innovative ways for the students to learn. Furthermore, Cerbito (2023) [5] especifically, researched Enhancing Learners' mathematical Performance through Mathscore. His study shows that the experimental group who use Mathscore got much higher scores which depicts that they got better performance compared with their post-test performance. The researcher also suggests that Mathscore program can be used as primary or secondary assistance in teaching different math topics. Also, de Jesus, Sharma, Setiawan *et al*. (2023) [16], Cerbito, Casanova *et al*. (2023) [3, 5] and Thomas (2024) [20 all their studies presented that utilization of interactive application helps increase students' knowledge, mastery of lesson and improve critical thinking skills.

2.3 Data evaluation

The author evaluates the contents of the research journal obtained so that the research data to be discussed can be in accordance with what is desired.

2.4 Data analysis and interpretation

For the study's data analysis, the following statistical tools were used:

- Frequency count and percentage were used to determine the demographic profile of the respondents and their first quarterly grade in mathematics.
- Weighted mean was utilized to determine the level of utilization of Mathscore.
- T-Test and F-test were used to determine the difference in the students' level of utilization of Mathscore, and difference in mathematics achievement when grouped according to their profiles.
- Pearson Product Moment Correlation was used to determine the relationship between the level of utilization of Mathscore program and the mathematics achievement of the Grade 10 students.

3. Results and Discussion

The substantial findings of the study are as follows:

1. Out of 89 respondents, 58.4% were female, while 41.6% were male. 43.2% came from middle-class families with a monthly income of P10,000-P30,000.
2. There was a high level of Mathscore utilization with an overall average weigthed mean of 2.98. Specifically, majority (59.8%) of students spent one hour per week using Mathscore; 29.9% spent two to three hours per week using Mathscore; and 8% spent four or more hours per week using Mathscore.
3. As to mathematics achievement, 50.6% (45 out of 89 students) achieved grades of 90 and above, and 33.7% (30 students) scored between 85-89.
4. There was no significant difference in the utilization of Mathscore when grouped according to gender and family income. A significant difference was found in time spent using Mathscore, indicating that students who spent more time using the program engaged with it more consistently.
5. A significant difference was found in mathematics achievement when grouped according to demographic profile, family income, and time spent using Mathscore. Students from higher-income families and those who spent more time using Mathscore tended to have higher mathematics grades.
6. There was no significant correlation between students' level of Mathscore utilization and their mathematics achievement. This suggests that other factors such as instructional methods, learning strategies, and student motivation may have influenced their performance.
7. Based on the findings, an action plan was created to enhance Mathscore implementation and maximize its effectiveness in improving students' mathematics performance.

4. Discussion

Table 1: Profile of Grade 10 Students

Profile		Frequency	Percentage
Gender	Male	37	41.6
	Female	52	58.4
Monthly family income	< 10,000	13	14.8
	10,000-30,000	38	43.2
	31,000-49,000	23	26.1
	>50,000	14	15.9
Hours spent using mathscore	Never	2	2.3
	1 hour or less	52	59.8
	2 -3 hours	26	29.9
	More than 4 hours	7	8.0
Total number of respondents: 89			

Table 1 presents the demographic profile of the 89 Grade

10 student respondents, categorized by gender, monthly family income, and hours spent using the Mathscore program.

The data revealed that the majority of the respondents were female, comprising 58.4% (52 students), while 41.6% (37 students) were male. This indicates a slightly higher representation of female students in the study. The predominance of female respondents suggests that more females participated in the Mathscore program, although it does not necessarily imply differences in engagement or performance based on gender.

Most of the respondents came from middle-income families earning between P10,000 and P30,000, making up 43.2% (38 students) of the sample. This was followed by 26.1% (23 students) who had a family income of P31,000 to P49,000. Meanwhile, 15.9% (14 students) had a monthly income above P50,000, and 14.8% (13 students) reported earning less than P10,000. These findings suggest that a significant portion of students came from households with modest financial means, which could influence their access to educational resources, including technology-based learning tools like Mathscore.

A substantial portion of the respondents, 59.8% (52 students), reported spending one hour or less per week on Mathscore. This suggests that while most students used the program, their engagement was relatively low. Additionally, 29.9% (26 students) utilized Mathscore for 2 to 3 hours weekly, indicating a moderate level of usage. However, only 8.0% (7 students) spent more than 4 hours on the program, demonstrating that a small fraction of students invested significant time in using the tool. Notably, 2.3% (2 students) reported never using Mathscore at all.

The findings indicate that although Mathscore was being utilized by most students, the time spent on the program was generally minimal, with nearly 60% using it for only an hour or less per week. This limited engagement could potentially impact the effectiveness of the program in improving students' mathematical achievement.

Moreover, gender distribution suggests that female students were more represented in the study, but there is no direct indication that gender influenced Mathscore usage. The financial background of the students also appeared to have no significant impact on the hours spent using Mathscore, as students from various income brackets exhibited similar engagement patterns.

Table 2: Students' Level of Utilization of Mathscore Program

Indicator	Weighted Mean	Verbal Interpretation	Rank
1. in studying math lessons everyday	2.62	High	10
2. to enhance my knowledge in our Math Topic	3.07	High	3.5
3. to advance my math skills	3.07	High	3.5
4. as a reviewer for my math lessons	2.84	High	8
5. because it is being used for math quizzes	2.98	High	7
6. because it is being used for application in our math lessons	3.17	High	2
7. for assignment purposes	3.05	High	5
8. because the instructions are easy to understand	2.78	High	9
9. because it is easy to use	3.00	High	6
10. to help me improve my math skills	3.21	High	1
Average	2.98	High	

Table 2 presents the students' level of utilization of the Mathscore program based on their study needs. According to the data, the respondents agreed that they utilized Mathscore to improve their math skills, with a weighted mean of 3.21, followed by using it to enhance and advance their math skills, both receiving a weighted mean of 3.07. Similarly, the program was used for applying math lessons, with a weighted mean of 3.17. Additionally, some respondents reported using Mathscore for assessment purposes, such as quizzes and assignments, with a weighted mean of 3.05.

However, the data also revealed reasons why some respondents did not prefer the Mathscore program. First, they did not perceive it as a daily necessity for studying math lessons, with a weighted mean of 2.62. Second, some respondents found it difficult to understand the instructions provided, resulting in a weighted mean of 2.78.

These findings aligned with the study conducted by Dela Cruz (2023), which indicated that Mathscore was perceived as a supplemental tool for learning mathematics. It supported students in enhancing their understanding of mathematical concepts, mastering lessons, and increasing motivation.

Table 3: Students' Level of Mathematics Achievement

Grade	Frequency	Percentage
75-79	6	6.7
80-84	8	9.0
85-89	30	33.7
90-100	45	50.6
Total	89	100.0

Table 3 presents the Grade 10 students' level of mathematics achievement based on their first grading period scores.

The data showed that 50.6% (45 out of 89 students) achieved grades between 90-100, indicating a strong performance in mathematics. Additionally, 33.7% (30 out of 89 students) obtained grades between 85-89, signifying that a majority of students performed well in the subject.

Meanwhile, 9.0% (8 out of 89 students) scored between 80-84, showing a satisfactory level of achievement. However, 6.7% (6 out of 89 students) had grades ranging from 75-79, representing the lowest-performing group among the respondents.

The findings suggest that most Grade 10 students performed well in mathematics, with 84.3% (75 out of 89

students) achieving grades of 85 and above. This indicates a generally high level of mathematics proficiency among the respondents.

However, the presence of students in the 75-79 grade range highlights a need for additional academic support or intervention to help struggling learners improve their performance. Future research or action plans could focus on identifying the challenges faced by these students and implementing strategies to enhance their mathematical understanding and engagement.

Table 4: Difference in the Students' Level of Utilization of Mathscore when grouped according to Profile

Profile	Test statistic	p-value	Interpretation
Gender	x_1=2.95 x_2=3.00 t=-0.505	0.615	Not Significant
Monthly family income	x_1=3.04 x_2=2.96 X_3=2.84 x_4=3.18 F=1.835	0.147	Not Significant
Hours spent using mathscore	x_1=2.00 x_2=3.08 X_3=3.62 x_4=3.86 F=5.032	0.003	Significant (Between 1&2, 1&3, 1&4, 2&3, 2&4)

*Significant @ 0.05

Table 4 presents the differences in the Grade 10 students' level of utilization of the Mathscore program when grouped according to their demographic profile.

The computed test statistic (t = -0.505) and p-value (0.615) indicate that there was no significant difference in the level of Mathscore utilization between male and female students. This suggests that gender did not play a role in how frequently or effectively students used the Mathscore program.

The computed test statistic (F = 1.835) and p-value (0.147) also indicate no significant difference in Mathscore utilization based on students' family income. This implies that regardless of their financial background, students utilized Mathscore at similar levels.

However, a significant difference was found in Mathscore utilization when students were grouped based on the number of hours spent using the program. The test statistic (F = 5.032) and p-value (0.003) suggest that students who spent more hours on Mathscore had a higher level of utilization compared to those who spent less time. The significance was observed between groups 1 & 2, 1 & 3, 1 & 4, 2 & 3, and 2 & 4, indicating that increased engagement with the program led to greater utilization.

Utilization and academic achievement among Grade 7 and 8 students of Our Lady of Peace Academy in Tuy, Batangas. The findings indicate that gender and family income did not significantly affect how students used Mathscore, meaning that these factors did not create disparities in utilization. However, the amount of time spent on Mathscore had a significant impact on its utilization, suggesting that students who dedicated more hours to the program made better use of its features and benefits.

Table 5: Difference in the Students' Level of Mathematics Achievement when grouped according to Profile

Profile	Test statistic	p-value	Interpretation
Gender	x1=3.03 x2=3.46 t=-2.321	0.023*	Significant
Monthly family income	x1=2.77 x2=3.42 X3=3.09 x4=3.64 F=3.060	0.033*	Significant (Between 1&4)
Hours spent using mathscore	x1=1.50 x2=2.86 X3=3.22 x4=3.34 F=20.698	0.000	Significant (Between 1&4, 2&3)

*Significant @ 0.05

Table 5 presents the differences in the Grade 10 students' level of mathematic achievement when grouped according to their demographic profile.

The results showed that female students (X_2 = 3.46) had significantly higher mathematics achievement compared to their male counterparts. This finding was supported by a computed p-value of 0.023, which is lower than the significance threshold of 0.05. This suggests that females tended to perform better in mathematics than males.

The analysis revealed that students from higher-income families (above P50,000, X_4 = 3.34) had significantly higher mathematics achievement than those from lower-income families (below P10,000, X_1), as indicated by a p-value of 0.033, which is lower than 0.05. This finding aligns with the study of Gao *et al*. (2011), which found that family economic status has a significant positive effect on students' academic performance, suggesting that children from high-income families tend to perform better in school.

However, this contradicts the findings of De Guzman (2025) and Casas (2023), which indicated that family income is not necessarily a determining factor for students' academic achievement. Their studies suggest that other factors, such as motivation, study habits, and access to learning resources, may also influence performance.

A significant difference was also found in the time spent using Mathscore and mathematics achievement. The pairwise combinations of $X_1 = 1.50$ and $X_4 = 3.34$, as well as $X_2 = 2.86$ and $X_3 = 3.22$, were significant, with a computed p-value of 0.000, which is lower than 0.05. This result suggests that students who spent more time using Mathscore tended to achieve higher mathematics grades.

This finding supports the study of De Jesus (2023), which found a significant relationship between Mathscore The study highlighted how adaptive learning tools like Mathscore can enhance students' understanding of mathematical concepts and improve their academic performance.

Table 6: Relationship between the Grade 10 Students' Level of Utilization of Mathscore and their Level of Mathematics Achievement

	Pearson r value	p-value	Interpretation
The Students' Level of Utilization of Mathscore and their Level of Mathematics Achievement	0.175 Low correlation	0.100	Not Significant

Significance level @ 0.05

As presented in Table 6, the analysis of the relationship between students' level of utilization of Mathscore and their mathematics achievement was conducted using Pearson's correlation coefficient (r).

The computed Pearson r value of 0.175 indicates a low correlation between Mathscore utilization and mathematics achievement. The p-value of 0.100 is greater than the significance level of 0.05, meaning the relationship was not statistically significant.

These results suggest that while there was a slight positive relationship between the students' utilization of Mathscore and their mathematics achievement, the correlation was weak and not significant. This implies that other factors, such as teaching strategies, student motivation, study habits, and external support systems, may have a stronger influence on students' mathematics performance than their use of Mathscore alone.

5. Proposed action plan

The study revealed that there was no correlation between the utilization of Mathcore and Mathematical Achievement of Grade 10 Students even though there was a high level of utilization of Mathscore, and respondents believed that it helped them enhance and master their math skills. Furthermore, it also showed that there was a low amount of time spent doing Mathscore and there were thoughts that students were having a hard time understanding the instructions, therefore, this action plan was developed to enhance the time spent in doing Mathscore and sustain the utilization of Mathscore together with their mathematics achievement throughout the school year.

6. Conclusion

Based on the findings the following conclusions were drawn:

- The majority of students spend only one hour per week using Mathscore.
- There is a high level of Mathscore utilization among Grade 10 students.
- The respondents demonstrate strong academic achievement in Mathematics.
- Regardless of gender and family income, the level of Mathscore utilization remains the same.
- Female students tend to achieve higher mathematics grades compared to their male counterparts. Additionally, students from higher-income families tend to have higher grades, and those who spend more time using Mathscore are more likely to achieve better performance in Mathematics.
- While Mathscore is being utilized by students, its level of usage is not high enough to create a significant impact on their Mathematics grades.
- The proposed action plan needs to be implemented to enhance Mathscore utilization and sustain students' academic performance throughout the school year.

7. Thank-You Note

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