USING TUTORIAL SESSIONS IN ENHANCING STUDENTS' PERFORMANCE AND ATTITUDE IN MATHEMATICS

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Abstract—The importance of Math in developing and interpreting problem-solving skills cannot be overstated in today's generation, where things are unpredictable. Unfortunately, many students have trouble understanding math ideas, which makes them do poorly in school and lose motivation. This research examined how tutoring sessions can help students do better in Math, focused on Math I in the tertiary level. Specifically, this study looked into how tutoring sessions have affected some college students' grades. The study project involved 28 students who were in a class during the second semester of the school year 2023-2024. The research plan that was used was a simple quasi-experimental design. The purpose of this study was to find out whether these sessions are positive in terms of improving the student's overall success. The students' ability had greatly improved by the end of the sessions. Their post-test scores showed much improvement compared to their pre-test scores, which proved this. According to the study's results, individualized interventions and targeted help are very important in improving students' general academic performance, as well as their ability to understand with confidence. The study emphasizes the importance of personalized support and targeted assistance in improving students' academic performance and confidence in comprehending mathematical principles. These results underscore the critical role of tailored academic interventions in enhancing students' learning outcomes and attitudes toward Mathematics. Implementing these findings can lead to improved academic success and a deeper appreciation for the subject among students.

Keywords: Academic achievement, individualized support, mathematical performance, personal learning, tutorial sessions.

I. INTRODUCTION (HEADING 1)

Mathematics in the Modern World (Math1) holds significant importance in college education as it serves as the foundation for many other subjects taught (Adusei & Sarfoq, 2020). This course aims to explore the effects of different peer tutoring approaches on academic achievement in mathematics (Cho et al., 2020). Research indicates that math tutoring programs significantly influence academic performance (Foster, 2021). However, mathematics remains a formidable challenge for many Filipino students (Capuno et al., 2019). The 2018 PISA results highlighted this issue, revealing that over 50% of Filipino students failed to meet basic proficiency levels in mathematics, with public school students particularly underperforming compared to their peers in private institutions (Lapinid et al., 2022).

In this context, tutorial sessions refer to personalized or small-group teaching sessions led by educators, paraprofessionals, volunteers, or parents. These sessions have proven to be one of the most adaptable and impactful educational strategies. Studies show that tutoring during school hours is particularly effective, even more than after-school programs (Nickow et al., 2020). This research sought to assess the impact of additional tutoring on first-year college students struggling with math (Fuchs et al., 2020). Effective tutoring requires a deep understanding of how students learn and provides opportunities for them to clarify concepts. Enhancing students' understanding of Mathematics 1 involves guiding them through tasks, extending the duration of tutoring sessions, setting clear objectives, and focusing on fundamental teaching techniques (Abdurrahman et al.,2019).

Academic Performance in mathematics is often measured through grades, tests, scores, and completion rates. However, many studies overlook psychological factors such as emotional intelligence, self-esteem, and self-efficacy- that also significantly impact student success (Ugwuanyi et al., 2020). Improving students' academic outcomes not only opens doors for further education but also boosts motivation and overall well-being (Madigan & Kim., 2021). The primary goal of teaching Mathematics is to empower students to use Math confidently in solving real-world problems. However, despite these efforts, a significant number of students continue to struggle with and fail in Math (Mazana et al., 2020).

Tutoring plays a crucial role in fostering student success, promoting academic independence, and reducing anxiety. Numerous studies have confirmed the benefits of tutoring in enhancing student outcomes (Kearns., 2024). Key areas of focus include 1) evaluating the performance of students receiving math tutoring, 2) assessing the instructional quality of tutoring sessions, and 3) investigating how these factors influence academic performance and overall student satisfaction (Guill., 2024). Well-designed peer tutoring programs can create intellectually secure environments that foster student engagement, which is vital for effective peer learning and collaborative knowledge creation (Cho et al., 2020).

The impact of peer tutoring on academic performance, self-perception, attitude, social interactions, and behavior has been widely studied. However, there is a gap in research specifically targeting peer-tutoring initiatives for younger students. This study explored classroom practices and the behaviors of both teachers and students within a cross-age peer-tutoring program implemented in elementary and middle schools. Observations will assess the program's implementation, revealing strengths in fostering positive emotions and supportive relationships and areas for improvement (Barahona, 2023).

Several factors influence students' acquisition and performance in Mathematics, including teaching methods and the overall school environment (Mazana et al., 2019). Student enthusiasm for learning Mathematics partly mediates the relationship between their motivation and performance, as well as between the quality of instruction and their success. However, the impact of peer-assisted learning on Math performance is fully influenced by students' interest in the subject (Arthur et al., 2022).

There is a notable gap in practical, action-based research within the field of Mathematics education. Much of the existing literature is theoretical, with few studies exploring the practical application of tutorial sessions. This gap highlights the need for research focused on practical interventions that can enhance students' understanding and Performance in mathematics, particularly in the context of Math 1 (Miles., 2017).

Peer tutors play a crucial role in motivating learners to engage with Mathematics in innovative ways, offering insights into strategies that can improve mathematical Performance through targeted interventions. Many students lack motivation to study math due to feelings of neglect, irrelevance, and low confidence. Peer tutoring offers these students a chance to connect with others who have overcome similar challenges, providing the support and encouragement needed to improve their math skills (Spangenberg., 2020)

Mathematics is very important in education. It is used in lots of different subjects and in real life, too. Lately, however, there has been some trouble with teaching and learning Math in college, Math I (Mathematics in the Modern World). To bridge this gap, we need to understand better why students find it hard to learn mathematics in the modern world. Therefore, the significance of this study is to investigate the potential impact of tutorial sessions on students' learning outcomes.

Due to students' poor academic performance and lack of motivation to learn Mathematics, the researchers to conducedt tutorial sessions to investigate whether they significantly impact the students' learning outcomes. By providing personalized and targeted instruction, the researcher aimed to address the challenges faced by students and improve their understanding and Performance in learning Math 1 at the tertiary level of Misamis Occidental during the second semester of SY 2023-2024.

Theoretical Framework

This study was connected to Scaffolding (Lev Vygotsky, 1978) and Social Learning Theory (Albert Bandura, 1977).

This study used Vygotsky's Scaffolding (1978). The theory emphasizes that students achieve their learning objectives by collaborating with a teacher or a proficient peer is known as instructional scaffolding. The premise of this method suggests that students can enhance their learning significantly through interaction with individuals possessing greater expertise and skills. These mentors or peers serve as supportive structures, guiding the students to broaden their knowledge and capabilities beyond what they could achieve independently.

Scaffolding facilitates bridging the gap between the learners' existing knowledge and the material being taught. It involves the teacher demonstrating a particular task and gradually providing information to the student to ensure a solid understanding of the subject matter. However, scaffolding can pose challenges for instructors as it requires relinquishing control to allow students to progress at their own pace (Anwar et al., 2022).

One of the abilities needed for tutoring is the ability to communicate an in-depth understanding of the subject. The tutoring skills discussed in this article, which focus on scaffolding when tutoring, can be used in a variety of subject areas. The creation of scaffolding strategies in tutorials or small group study sessions is significantly influenced by the theories of Lev Vygotsky about communication and education. These concepts can be employed in a much wider context when a tutor or facilitator uses them to assist a student in learning a certain topic at the most fundamental and urgent level of that student's academic need. Helping tutors and facilitators include students in the learning process is the goal of the scaffolding method (Valkenburg., 2010). The findings of Vygotsky's Scaffolding theory suggest that students can achieve their learning objectives more effectively through collaboration. This instructional approach emphasizes the importance of interaction with individuals possessing greater expertise and skills, who serve as supportive structures guiding students to expand their knowledge and capabilities beyond what they could achieve independently.

In addition, this study is anchored on the Social Learning Theory (Albert Bandura's, 1977). Social learning theory helps us understand how people learn by watching and copying others rather than just by reading or studying alone. By looking at concepts like watching others, copying behavior, being rewarded for certain actions, feeling confident in our abilities, and how others influence our behavior, researchers and educators can learn more about how students learn and develop behaviors through their interactions with others. It is important to do more research and studies to confirm and build upon this theory (Bandura & Walters., 1977).

Students can improve their learning by observing how other students study. When students look at how their peers study and check on each other's progress, it is called social learning. Students often do not use extra materials or change their notes. By using this method, not only did students improve their learning, but they also developed better study habits in Math (Hwang et al., 2021). These findings suggest that Albert Bandura's Social Learning Theory supports students' performance by allowing them to observe, imitate, and engage in social interaction. It explains how students learn and adopt behaviors through their interactions with others.

Conceptual Framework

The conceptual framework depicted in the schematic diagram (Figure 1) outlines the study's structure for evaluating the effectiveness of tutorial sessions on students' academic performance and attitude. It is organized into four main components: Pre-Test, Student Attitude Before, Tutorial Sessions, Post-Test, and Student Attitude After. The **Pre-Test** involves assessing the student's knowledge and skills before participating in the tutorial sessions, serving as a baseline measurement to compare against post-test results.

Student Attitude Before component gauges the students' attitudes towards the subject matter and learning process prior to the tutorial sessions, providing insight into how the tutorials may influence their perspectives. The **Tutorial Sessions**, which form the core of the framework, represent the instructional intervention designed to enhance students' understanding and engagement with the subject matter. After completing the tutorial sessions, students undergo a **Post-Test** to measure any changes in their academic performance, allowing for an evaluation of the tutorials' effectiveness by comparing these results with the pre-test scores.

Finally, the **Student Attitude After** component assesses the students' attitudes following the tutorial sessions, enabling the study to determine the instructional intervention's impact on students' perspectives by comparing these attitudes with those measured before the tutorials.

Conceptually, the utilization of Using Tutorial Sessions involves students learning together in pairs under the guidance of a teacher, emphasizing student-centered teaching. (Hidayat et al., 2023). The components of Tutorial Sessions include (a) one-on-one tutoring and (b) peer tutoring.

One-to-one tutoring from human tutors can help students learn better. However, it is hard to check if this teaching is effective. Good tutors know when to step in and when to let students correct themselves. This method seems promising for checking how well one-on-one math tutoring is working for primary school students (Cukurova., 2022). Students choose one-on-one math tutoring to improve their skills, believing it helps them overcome challenges faced in regular classroom teaching. They feel it boosts their math performance. Schools should factor in the classroom atmosphere when deciding whether students need one-on-one tutoring to enhance their math achievement (Barry., 2022)

Students participating in the implementation of the Mathematics Peer Tutoring Program assist educators in understanding how to promote mathematical proficiency through Peer Tutoring and establish a Community of Practice that serves as a platform for learners to attain cognitive and behavioral growth (Carisma., 2022). The school and classroom teachers can utilize peer tutoring as an educational strategy, which involves students forming partnerships where higher-achieving students are paired with lower-achievers or peers with similar performance levels, facilitating structured reading and math study sessions (Candelaria., 2023)

Enhancing Students' performance should allow students to demonstrate knowledge and skills and measurable outcomes of their academic achievement and abilities (Bland & Gareis., 2019). The components of Enhancing Students' Performance include (a) pre-test, (b) post-test, and (c) attitude

The pretest was given during the session to enhance student engagement and active involvement in learning. Our objective is to compare small-group peer learning modules with traditional teacher-led tutorial sessions to understand their effects on learning outcomes and the overall learning experience (Vinay., 2024). Engaging in pretesting, which involves taking a practice test before tutoring, can result in comparable or even superior learning advantages compared to post-testing, where the practice test is taken after tutoring. Both pretesting and post-testing enhance memory retention of the tested material, and occasionally, they also boost memory for information not directly tested (Pan., 2021). Pretesting before lectures can help students learn better. Students took a quick pretest before certain lectures. These tests covered topics that would be taught in the lecture right after (Soderstrom., 2023).

After each session, participants received post-tests and were asked for feedback. Analysis of the post-test data showed improvement in both learning methods compared to the pretest. Peer learning showed significantly greater progress compared to tutorials. While tutorials were appreciated for their comprehensive coverage and time-saving nature, participants found them occasionally monotonous and lacking in active engagement (Vinay., 2024).

Students' Attitudes towards sustainability and education for sustainable development could be influenced by the requirements of their academic programs. It proposes that students exposed to diverse, interdisciplinary requirements might tend to hold more favorable views on sustainability compared to those concentrating solely on a specific discipline (Natasha., 2024).

Various studies have supported the effectiveness of tutorial sessions in improving student outcomes. According to Albino et al. (2021), structured tutorial sessions can significantly enhance students' academic Performance by providing personalized instruction and addressing individual learning needs. This allows for targeted intervention that is particularly beneficial for students struggling with specific concepts.
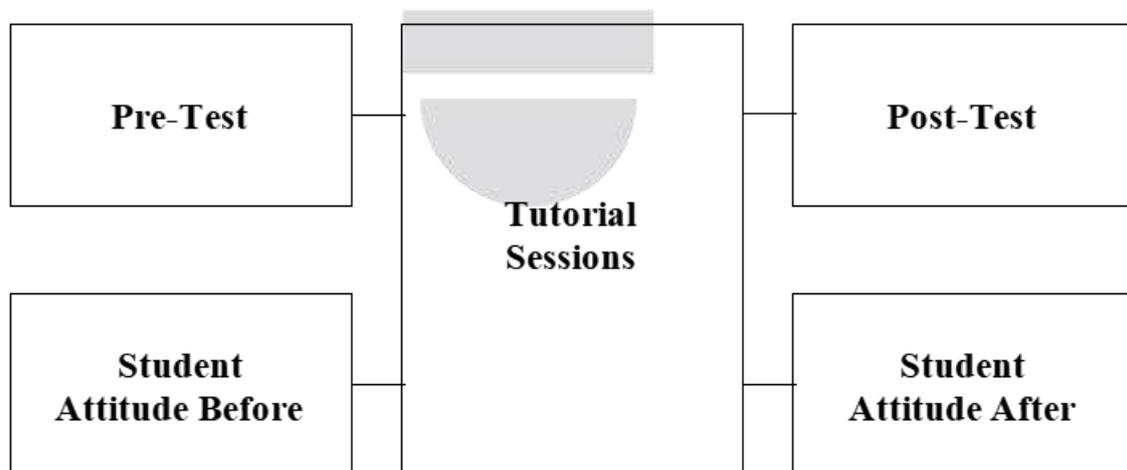
Figure 1. Schematic Diagram of the Study

Statement of the Problem

This study investigated the use of tutorial sessions in enhancing students' performance in Mathematics at a designated tertiary institution in Ozamiz City during the academic year 2023-2024. In particular, the study aimed to address the following questions:

1. What is the performance of students in Math before the conduct of tutorial sessions?
2. What is the attitudes of students towards Math before the conduct of tutorial session?
3. What is the performance of students in Math after the conduct of tutorial sessions?
4. What is the attitudes of students towards Math after the conduct of tutorial session?
5. Is there a significant difference between the students' Performance before and after the tutorial session?
6. Is there a significant difference between the students' attitudes before and after the tutorial session?

Null Hypotheses

Ho_1: There is no significant difference between the students' performance before and after the tutorial session.

Ho_2: There is no significant difference between the student's attitudes before and after the tutorial session.

Research Design

The quantitative study uses a quasi-experimental design. The comparative method was implemented in the quasi-experimental design to determine whether the students' pre-test and post-test outcomes were significantly different after the lessons and tutorial sessions (Reichardt et al., 2023). This design simplified the process of predicting and elucidating the relationship between the variables (Seeram, 2019). The quasi-experimental design was particularly suitable for this investigation, as it assessed the efficacy of tutorial sessions in improving students' Performance in Mathematics in the Modern World (Math I).

Research Setting

The investigation was carried out at a particular tertiary institution in Ozamiz City, known as the first university in Northwestern Mindanao, to attain "Autonomous Status" from the Commission on Higher Education (CHED). This university houses 12 colleges offering a total of 29 programs, encompassing graduate programs and full Basic Education courses. Notably, it has received an outstanding rating from DNV for its ISO 9001: 2008 certification. Additionally, it has been consistently acknowledged by PACUCOA (The Philippine Association of Colleges and Universities Commission on Accreditation) for having the highest number of accredited programs in Region X for two consecutive years. Moreover, the university has successfully undergone the Institutional Sustainability Assessment (ISA), with CHED designating its information technology, criminology, and teacher education programs as Centers of Development (COD). Misamis University provides a diverse array of college courses organized under various academic departments such as Agriculture and Forestry, Business and Management, Arts and Sciences, Computer Studies, Dentistry, Criminology, Education, Engineering and Technology, Maritime Education, Medical Technology, Nursing, Midwifery & Radiologic Technology. These departments offer students a multitude of degree options, enabling them to explore their interests and acquire the necessary skills and knowledge for success in their chosen fields. As part of the General Education (GE) curriculum, students across these colleges are required to take Mathematics 1 (Mathematics in the Modern World).

Respondents of the Study

The respondents of our study were 28 college students from a selected tertiary school in Ozamiz City. It utilized purposive sampling techniques in which the following criteria were used to choose the respondents: (1) College students who are enrolled in the second semester of SY 2023-2024, and are taking Mathematics in the Modern World (Math I) subject; (2) students who are willing to participate in the study. Before starting the surveys, the researchers ensured that all the criteria were followed.

Research Instrument

The research employed a survey questionnaire for collecting data, namely the Tutorial Session in Attitudes Towards Mathematics Questionnaire and a Test (Quiz) for Pretest and Post-Test

A. **Attitude Towards Mathematics Questionnaire** (Appendix A). This questionnaire was adapted from Tapia and March, (2004). The items were constructed using a 4-point Liker scale format, and the students responded to the statements on a scale ranging from always (4), often (3), sometimes (2), to never (1). The instrument contains 20 items with four constructs, namely, self-confidence (5 items), value (5 items), enjoyment (5 items), and motivation (5 items). The items were relevant to this study since they emphasized students' attitude in using tutorial session in enhancing students' performance in math.

In determining the students' attitudes toward mathematics, the following scale was used:

Responses	Continuum	Interpretation
4- Always	3.25-4.0	Very Good
3- Often	2.5-3.24	Good
2- Sometimes	1.75-2.49	Poor
1- Never	1.0-1.74	Very Poor

B. Test (Quiz)

The research employed a combination of tests and questionnaires to gather the necessary data for this study. These instruments were designed to measure students' performance in Mathematics and their attitudes towards the subject before and after the tutorial sessions.

The Mathematics Performance Test (APPENDIX B) This test was from Bagsican and Balbuena (2023) which assessed students' knowledge and skills in Mathematics both before and after the tutorial sessions. It consisted of 50 multiple-choice questions covering key topics such as Measures of Central Tendency, Measures of Variation, Deductive and Inductive Reasoning, Correlation, and Translation of English Phrases into Mathematical Concepts in Mathematics in the Modern World (Math I).

The same test was administered for both the pre-test and post-test to ensure consistency in measuring students' performance.

In determining the students' performance toward Mathematics, the following scale was used:

Score Range	Interpretation
42-50	Outstanding
38-41	Very Satisfactory
34-37	Satisfactory
30-33	Fairly Satisfactory
1-29	Did not Meet the Expectations

Data Collection

The researchers asked permission first from the College of Education dean before conducting the study. Then, we requested approval from the chairman of BSED-Mathematics, as the study focused on the said course. Once the permit was approved, the researchers informed the research instructor, prepared a consent letter for the participants and explained the purpose of the study. Subsequently, the researchers developed a printed questionnaire and shared with the students. Once the questionnaires were completed, the data was tallied using Microsoft Excel application and subjected to statistical computations using the Minitab software. The results were presented in tabular form for analysis and subsequent interpretation of the data.

Ethical Considerations

The current study adapted the Bell and Bryman 2007 ethical principles. The researchers observed the following ethical considerations: (1) Informed consent was given to the respondents to make them aware about the reason in conducting the study, (2) respondents were assured that all the data gathered were kept confidential, (3) respondents were informed that they could withdraw their participation in the study at any time they wished to, (4) the dignity of research participants was also prioritized, (5) sufficient level of confidentiality for research data was also ensured, (6) individuals participating in the research remained anonymous, (7) the research was done with honesty and transparency and (8) finally, any misinformation of any kind and biased representation of main data for the findings were avoided.

Data Analysis

The study used the following tools in analyzing the data gathered with the use of Minitab Software:

Mean and Standard Deviation were used in determining the students' performance in Math before and after the conduct of the tutorial session and their attitudes towards Math before and after the conduct of the tutorial session.

The *Paired T-Test* was utilized to explore the significant difference between the students' Math performance before and after the tutorial session and their attitudes towards math before and after the tutorial session.

Student's Performance before the conduct of Tutorial Sessions

Students' Math performance before the conduct of tutorial sessions was measured using a pre-test questionnaire (Table 1). The data revealed that overall performance did not meet the expectations (M = 27.89; SD = 5.75). It indicates that, on average, students scored below the expected standards, highlighting a significant need for intervention to improve their mathematical abilities.

The data showed that 28 students took the pre-test, representing 100% of the sample. The mean pre-test score of 27.89 (SD = 5.75) indicates that students' performance fell within the "Did not Meet the Expectations" category. This indicates that the majority of students struggled with Math before a tutoring session was provided.

The significant variation in scores underscores the importance of personalized and targeted instructional strategies to address the diverse learning needs of students. According to Quirino et al. (2021), implementing structured tutorial sessions can significantly enhance student performance, particularly in subjects requiring cumulative knowledge and skills, such as Mathematics. This aligns with findings from the study of Sibaen et al. (2023) which found that students often struggle with Math concepts, leading to lower performance levels without interventions like tutorials. It was discussed that students face various difficulties in Mathematics without extra help, such as inadequate learning materials and support, challenges in submitting requirements on time, fear and anxiety, weak foundation, and difficulties in understanding Mathematical concepts and problem-solving (Waswa et al., 2023). Thus, these related studies supported the result which shows that students face difficulties in Mathematics without extra help.

This result underscores the importance of creating a comprehensive teaching program specifically designed to meet the needs of the 28 students. The program should provide personalized support, tailor instruction to the individual learning styles and needs of each student and offer one-on-one or small-group assistance as necessary. Effective learning tools, including interactive software, visual aids, and hands-on activities, should be incorporated to engage students and reinforce key mathematical concepts. Additionally, the program must address Math-related anxiety by implementing strategies such as relaxation techniques, positive reinforcement, and fostering a supportive classroom environment.

Strengthening fundamental math skills is crucial, with targeted exercises and consistent practice used to build a solid foundation for further learning. Continuous assessment and feedback should be an integral part of the program, allowing for regular testing and progress monitoring to ensure ongoing improvement and provide students with constructive feedback.

Furthermore, supplementary support, such as tutorial sessions, should be offered to enhance students' performance by providing extra practice opportunities and reinforcing learning outside of regular class hours.

Table 1

Performance of Students in Math Before the Conduct of Tutorial Sessions

Construct	Total Count	Percent	Mean	SD	Remarks
Pre-Test	28	100	27.89	5.75	Did not Meet the Expectations

Note: 42-50 (Outstanding); 38-41 (Very Satisfactory); 34-37 (Satisfactory); 30-33 (Fairly Satisfactory); 1-29 (Did not Meet the Expectations)

Student's Attitude Towards Math Before the Conduct of Tutorial Session

The students' attitude towards Math before the conduct of tutorial sessions was measured across self-confidence, value, enjoyment, and motivation (Table 2). The data reveal that students generally had good levels of self-confidence (M = 2.96; SD = 0.84) and value (M = 3.14; SD = 0.84) towards Math. This indicates that students feel fairly confident in their mathematical abilities and recognize the importance of Math in their education and future careers. However, the mean scores suggest that there is still room for improvement to reach a higher level of self-confidence and value.

On the other hand, students show poor levels of enjoyment (M = 2.43; SD = 0.74) and motivation (M = 2.18; SD = 1.02) towards Math. The low enjoyment score indicates that many students do not find Math enjoyable, which can affect their engagement and interest in the subject. Similarly, the low motivation score suggests that students lack the drive to excel in Math, which could negatively impact their learning and performance. The variability in scores, especially in motivation (SD = 1.02), highlights diverse attitudes among students that need to be addressed.

A study by Villarreal-Lozano et al. (2022) found that although students recognize the importance of Math, their enjoyment and motivation often decrease when they encounter difficulties. However, interventions such as tutorials can help mitigate these challenges. Baten et al. (2020) further emphasized that an autonomy-supportive instructional style, which increases students' sense of autonomy, can counteract the negative impact of task difficulty on motivation. This highlights the crucial role of supportive learning environments in maintaining students' motivation in Math. Similarly, Laarma (2021) suggested that while students may improve their learning, the absence of motivation and confidence can hinder their ability to connect with and fully engage in the subject, indicating that self-confidence is closely related to their academic outcomes.

Given these findings, it is recommended to implement strategies that not only enhance students' enjoyment and motivation but also preserve their self-confidence and appreciation of Math's value. This can be achieved by incorporating engaging and interactive teaching methods, such as gamification and real-world applications of math concepts, to make learning more enjoyable. Additionally, adopting a supportive and autonomy-focused teaching style can help reduce the negative effects of challenging tasks, thereby boosting motivation. Providing students with regular positive feedback and fostering a collaborative classroom environment can further sustain their motivation and enjoyment in Math, ultimately leading to improved attitudes and academic performance.

Based on these findings, it is recommended to implement targeted tutorial sessions that not only focus on improving mathematical skills but also aim to enhance students' enjoyment and motivation. Engaging and interactive teaching methods can make learning math more enjoyable, while personalized support can help boost students' confidence and motivation. According to Padua et al. (2023), such interventions can significantly improve students' attitudes and performance in math, leading to better learning outcomes and a more positive overall experience with the subject.

Table 2

Attitude of Students Towards Math Before the Conduct of Tutorial Session

Construct	Mean	SD	Remarks
Self - Confidence	2.96	0.84	Good
Value	3.14	0.84	Good
Enjoyment	2.43	0.74	Poor
Motivation	2.18	0.02	Poor
Overall Attitude	2.68	0.61	Good

Note: 3.25-4.0 (Very Good); 2.50-3.24 (Good); 1.75-2.49 (Poor), 1.0-1.74 (Very Poor)

Student's Performance after conduct of Tutorial Sessions

Students' math performance after tutorial sessions was measured using a post-test (Table 3). The data reveal that overall performance significantly improved, with the mean score reaching a "Very Satisfactory" level (M = 39.04; SD = 3.14). This

indicates that the tutorial sessions were effective in enhancing the students' mathematical abilities, as their scores improved from the pre-test results, moving from Did not meet the expectations to "Very Satisfactory."

The total count of participants remained 28, representing 100% of the sample. The mean post-test score of (39.04), with a standard deviation of (3.14), shows a marked improvement in student performance. This suggests that the tutorial sessions successfully addressed the students' learning gaps, leading to better academic outcomes.

These findings are reinforced by Tapado (2023), who highlighted the effectiveness of tutorial sessions in improving math performance. The study discussed various approaches, including pre-recorded lessons, home tutorial sessions, remedial programs with one-on-one instruction, and peer tutoring. It also emphasizes the importance of analyzing tutor-tutee interactions to identify effective strategies for enhancing students' understanding of Math, which is often considered the hardest subject. Similarly, Calabrese et al. (2022) found that students who receive tutoring, whether through personal tutors, programs like Kumon, or studying with school friends, tend to perform better academically than those who do not. This demonstrates the significant benefits of additional instructional support in boosting academic outcomes.

Future tutoring programs should offer a range of methods to meet the needs of all students, including pre-recorded lessons, home tutorials, one-on-one lessons, group tutoring, and interactive conversations between tutors and students.

Based on these positive results, it is recommended that tutorial sessions be continued and possibly expanded to maintain and further enhance students' math performance. Regular monitoring and assessment should be conducted to ensure the sessions effectively meet students' needs. Additionally, Mamuad et al. (2019) suggested that incorporating feedback from students can help refine the tutorial methods to keep them engaging and beneficial. Maintaining such initiatives will support sustained improvements in students' math performance.

Table 3

Performance of Students in Math After the Conduct of Tutorial Sessions

Construct	Total Count	Percent	Mean	SD	Remarks
Post-Test	28	100	39.04	3.14	Very Satisfactory

Note: 42-50 (Outstanding); 38-41 (Very Satisfactory); 34-37 (Satisfactory); 30-33 (Fairly Satisfactory); 1-29 (Did not Meet the Expectations)

Students' Attitude Towards Math After the Conduct of Tutorial Session

The students' attitude towards Math after the conduct of tutorial sessions was evaluated across self-confidence, value, enjoyment, and motivation (Table 4). The data revealed that students had a good level of self-confidence (M = 3.11; SD = 0.69), indicating that they felt reasonably confident in their mathematical abilities. The value students placed on Math improved to a very good level (M = 3.61; SD = 0.63), suggesting that students recognized the importance and relevance of Math in their education and future careers. Students' enjoyment of Math also improved to a good level (M = 2.68; SD = 0.61), indicating that they found math more enjoyable after the tutorial sessions. Similarly, motivation showed an increase to a good level (M = 2.92; SD = 0.77), reflecting a higher drive to engage and succeed in math. These findings show that there are consistent improvements in attitudes towards mathematics.

These results agree with what other studies have found about how tutorials affect how students feel. For instance, Rehman et al.'s (2023) study found that successful tutoring changes how students feel about math. Additionally, as Galang (2021) pointed out, tutoring programs often lead to more enjoyment and respect for the subject as well as higher self-esteem. Fathoni et al. (2019) found that while tutorials improve attitudes and performance, ongoing support is needed to greatly boost motivation. This is in line with the slight increase in motivation.

To further enhance students' attitudes towards Math, it is recommended to continue and expand tutorial sessions, focusing on activities that build self-confidence, highlighting the value of Math, and increasing enjoyment. Incorporating engaging, hands-on learning experiences and providing ongoing support are essential to maintain and boost motivation. Regular evaluations and adjustments based on student feedback will help tailor the tutorials to better meet individual needs and sustain the positive impact on their attitudes. These findings show that focusing on interactive and motivational teaching strategies will help sustain and build upon these improvements, leading to better engagement and performance in Math.

Table 4

Attitude of Students Towards Math Before the Conduct of Tutorial Session

Construct	Mean	SD	Remarks
Self - Confidence	3.11	0.69	Good
Value	3.61	0.63	Very Good
Enjoyment	2.68	0.61	Good
Motivation	2.92	0.77	Good
Overall Attitude	3.08	0.68	Good

Note: 3.25-4.0 (Very Good); 2.50-3.24 (Good); 1.75-2.49 (Poor), 1.0-1.74 (Very Poor)

Significant Difference Between the Students Performance Before & After the Tutorial Session

The difference in the performance of students in Math before and after the tutorial sessions was analyzed using paired t-tests (Table 5). The data reveal a substantial improvement in students' performance after the tutorial sessions, with the mean score increasing from 27.89 (SD = 5.29) before the sessions to 39.04 (SD = 3.14) after. This difference was found to be highly significant, as indicated by the t-value of 11.70 and a p-value of 0.000, well below the 0.01 threshold. This suggests that the tutorial sessions had a very positive impact on students' mathematical Performance.

The paired t-test results align with other studies supporting the effectiveness of instructional interventions. For example, Cukier (2022) found that individualized tutoring significantly improves academic performance, particularly when it aligns with students' preferred learning styles. Similarly, Krablam (2021) demonstrated that tutorial programs enhance achievement more effectively than traditional classroom instruction. Research also showed that tutorial models, such as the Student Team Achievement Division (STAD), improve learning outcomes for elementary students (Collins et al., 2021). The data confirms that personalized tutoring can effectively close learning gaps and boost student success, as evidenced by the notable improvement in Performance observed between the pre-and post-tutorial periods.

This result implies that the tutorial sessions should be maintained and expanded in order to significantly improve the arithmetic performance of the students. It is important to regularly assess students' development and make necessary adjustments to the teaching methods. Including student comments can improve the effectiveness and engagement of the sessions. The sessions can maintain the growth in students' arithmetic abilities and increase their confidence and motivation in the subject by emphasizing personalized and interactive teaching tactics.

Table 5

Difference Between Performance of Students Before & After the Tutorial Session

Variables	M	SD	t-value	p-value	Remarks
Before Tutorial Session	27.89	5.29	11.70	0.000	Highly Significant
After Tutorial Session	39.04	3.14			

*Note: **p<0.01* (Highly Significant)*; *p<0.05* (Significant)*; p>0.05* (Not significant)

Significant Difference Between the Students Attitude Before & After the Tutorial Session

The difference in students' attitudes towards Math before and after the tutorial sessions was examined using paired t-tests (Table 6). The results reveal varying levels of significance across different attitude constructs. Specifically, there was no significant change in self-confidence toward Math (t = 0.66, p = 0.52), indicating that the tutorial sessions did not have a significant impact on students' self-confidence in their Mathematical abilities. However, there were significant improvements in other attitude constructs: value (t =2.29, p = 0.03), enjoyment (t = 2.65, p = 0.01), and motivation (t = 2.55, p = 0.02). These findings suggest that the tutorial sessions were effective in positively influencing students' perceptions of the value, enjoyment, and motivation related to math.

The "Not Significant" remark in terms of self-confidence implies that while there may have been some changes in self-confidence levels, these changes were not large enough to be considered statistically meaningful. This could indicate that the tutorial sessions were effective in improving certain aspects of students' attitudes, such as their perception of the value, enjoyment, and motivation related to math, but did not sufficiently address or enhance their self-confidence.

The lack of significant change in self-confidence implies that additional strategies may be needed to specifically address and enhance students' confidence in math. Conversely, the significant improvements in value, enjoyment, and motivation highlight the effectiveness of the tutorial sessions in improving students' overall attitudes toward math. These results support previous research, which indicates that engaging and supportive learning environments can foster positive attitudes and motivation among students (Ocampo et al., 2020).

These findings indicate that the tutorials did not significantly influence students' attitudes despite enhancing their performance levels. This is consistent with the research conducted by Manalang et al. (2022), which demonstrated that tutoring can enhance academic performance. However, modifications in attitude may necessitate alternative or supplementary interventions. Bondoc (2020) discovered that while tutoring can occasionally improve self-confidence and enjoyment, it frequently necessitates more extensive and enduring endeavors to significantly alter student attitudes.

To significantly improve students' self-confidence in Math alongside other positive attitude changes, it is recommended to supplement tutorial sessions with additional interventions focused specifically on building self-confidence. Students' self-confidence can be increased by incorporating growth mindset-promoting activities, providing frequent positive reinforcement, and giving them chances to experience small math achievements. Extensive and ongoing efforts are required to promote a more profound and long-lasting shift in students' attitudes about arithmetic.

According to these results, it is suggested that more tutorial sessions be held with the goal of improving students' views on the worth, fun, and motivation of math. Using interactive and inspiring teaching methods can help keep these positive changes in mood going. Also, there should be ongoing assessment and feedback systems built in so that the tutorial lessons can be watched and changed as needed. Teachers can help students be more interested in and successful in math in the long run by creating a supportive learning environment and working on specific aspects of students' attitudes.

Table 6

Difference Between Attitude of Students Before & After the Tutorial Session

Variables	*t*-value	*p*-value	Remarks
Self-confidence	0.66	0.52	Not Significant
Value	2.29	0.03	Significant
Enjoyment	2.65	0.01	Highly Significant
Motivation	2.55	0.02	Significant

Note: **p<0.01 (Highly Significant); *p<0.05 (Significant); p>0.05 (Not significant)

Summary

This study, which included 28 participants, aimed to determine how well tutorial sessions in Ozamiz City improved students' performance and attitude in mathematics. A simple quasi-experimental design was used to examine how tutorial interventions affected students' pre-and post-test results. The primary goal of the study was to assess how students' mathematical proficiency changed after participating in tutorial sessions in order to offer useful information for improving math academic performance.

The study's scope was limited to the use of tutorial sessions in a particular academic environment, which limited the findings' applicability to other establishments. Despite this limitation, results showed that students' performance in math improved significantly as a result of participating in tutoring sessions. The implications of these results emphasize the value of individualized support in improving learning outcomes and imply that focused tutorial programs can successfully address students' difficulties in mathematics instruction. The results of the study showed that after the tutorial sessions, students' Math performance significantly improved; all 28 participants received an average post-test score of 39.04, which was classified as "Very Satisfactory." A decline in the standard deviation of results, which indicates less variability and suggests that the majority of students benefited from the tutorial sessions, corroborated this improvement in mathematical skills. This study illustrates the importance of customized academic support services in fostering student achievement in mathematics by demonstrating the beneficial effects of tutorial interventions.

Findings

The following are the salient findings of the study:

1. The performance of students in Math before the conduct of tutorial sessions was rated as "did not meet the expectations".

2. Before the tutorial session, students' attitudes towards math were "good" in terms of their self-confidence and value. However, students' enjoyment and motivation were "poor."

3. The performance of students in Math after the conduct of tutorial sessions improved to "very satisfactory".

4. After the tutorial session, students' attitudes toward math were "good" in terms of their self-confidence, enjoyments, and motivation. However, students' value was "very good".

5. There was a significant difference in the performance of students before and after the tutorial session.

6. There was a significant difference in students' attitudes before and after the tutorial session in terms of their value, enjoyment, and motivation. However, there was no significant difference in terms of their self-confidence.

Conclusions

Based on the findings, the following conclusions were drawn from this study:

1. Tutorial sessions significantly enhanced students' mathematics performance, reflected in a "Very Satisfactory" post-test mean score of 39.04.
2. Following the tutorial sessions, students exhibited a positive shift in their attitudes toward math, characterized by increased self-confidence and a greater appreciation for the subject.
3. However, challenges remain in improving students' enjoyment and motivation levels in mathematics.
4. Personalized academic support through tutorial interventions effectively addressed individual learning needs and created a positive learning experience in mathematics.
5. The findings underscore the necessity of targeted support in enhancing both academic performance and attitudes towards math.
6. The significant differences observed in performance and attitude before and after the tutorial sessions affirm the effectiveness of the intervention.

Recommendations

The following recommendations are based on the research findings and conclusions:

1. Implement tutorial sessions tailored to each student's specific needs to strengthen fundamental math skills, address math-related anxiety, and ensure continuous evaluation and adjustment of teaching methods.
2. Continue providing targeted tutorial programs for students struggling with math, thereby maintaining the positive trend in academic Performance established through the tutorial sessions.

3. Incorporate instructional strategies that promote student autonomy and cognitive engagement, thereby increasing motivation and fostering a supportive learning environment.

4. Uphold ethical research practices by prioritizing informed consent, confidentiality, participant anonymity, and transparency in all academic support activities.

5. Regular tutorial sessions should be maintained as an integral form of academic support to sustain the positive impacts on students' attitudes toward mathematics and their overall academic achievement.

6. Establish a system for ongoing assessment and feedback to monitor students' progress and adjust tutorial interventions as needed. This will help ensure that the positive effects on academic performance and attitudes toward math are sustained over time.

II. ACKNOWLEDGMENT

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