



Peer Tutoring on Enhancement of Mathematics Performance of Selected Grade 6 Students at Gregorio Herradura Elementary School, Victoria, Laguna, Philippines

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ABSTRACT

Peer tutoring is a learning method that entails student partnerships that pair good students with lower achievers or pupils with comparable achievement for systematic reading and math study times. The main purpose of this study is to determine the problems of selected grade 6 students in mathematics that would help the students enhance their academic performance in the subject. The data gathering will be done by selecting grade 6 students, both female and male, with separate results from the conducted pretest and posttest questionnaires. Other students who do not fall into the category are not included in the collection of information. The only purpose of this study is to achieve its goal, and it won't investigate anything else. After using dependent T test at the scores of the students after pretest and posttest, we got a computed value (T Value) of -5.6803. With a critical value of -2.0195, we can reject the null hypothesis and conclude that peer tutoring can bring a significant difference to the combined result of critical thinking and problem-solving test. The finding suggests that school heads and classroom teachers may use "peer tutoring" as a learning method for helping the learners improve their performance in mathematics. The school and the classroom teachers may use peer tutoring as a learning method that entails student partnerships that pair good students with lower achievers or pupils with comparable achievement for systematic reading and math study times

Keywords: peer tutorial, mathematics performance skills, DepEd

1 Introduction

Peer learning is a comprehensive learning strategy. It includes a wide range of activities where students learn using different methods. Giving them the chance to practice the methods and approaches they will need to use is an important way for them to learn the skills they will need in life. Education will therefore need to be very important. Mathematics includes teaching pupils how to use what they already know and using logic and reasoning to solve problems that they have never seen before. Success in school and in daily life depends on having a solid foundation in mathematics. On the other hand, many students are afraid of mathematics, which

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How to Cite:

Philip Cyrill Candelaria, "Peer Tutoring on Enhancement of Mathematics Performance of Selected Grade 6 Students at Gregorio Herradura Elementary School, Victoria, Laguna, Philippines". *AIJR Preprints*, 425, Version 1, 2022.

is known as "mathematics anxiety." Tutoring was the most used solution to their academic difficulties. It is the process in which a tutor or someone who is more capable of doing something will guide the person or group. The purpose of tutoring is to help students themselves, or to assist or guide them to the point at which they become independent learners and thus no longer need a tutor. Tutoring is a great tool for the tutor to expand their learning. The more they teach, the more they will master a certain topic or subject matter. Tutoring not only helps the student or child get smarter, but it also helps him or her get along with his or her peers. Implementing peer-tutoring to cope with academic challenges, especially in mathematics, gives the students opportunities to give strength to each other. Giving them a companion to help them solve the problem they think is hard. Giving them the interaction that will boost their confidence and give them a better academic performance.

Ulep (2014) emphasized that critical thinking and problem-solving abilities are the main objectives of mathematics in grades k–12. To accomplish these goals, it is necessary to assess teachers' readiness for the task at hand as well as their level of perception of the subject matter, instructional strategies, and teaching methods. Critical thinking and problem-solving abilities are the main objectives of mathematics in grades k–12. To accomplish these goals, it is necessary to assess teachers' readiness for the task at hand. This study will help teaching institutions determine how prepared teachers are to use the spiral approach to teach math.

According to Nunez-Peña et al. (2019), mathematics anxiety has a significantly negative impact on students' achievement in mathematics. This is attributed to students with high levels of mathematics anxiety and a lack of social skills provided through cooperative learning strategies such as peer tutoring. Peer tutoring is an active teaching method that fosters pupil inclusion while enabling students to study from the knowledge of each other. When students tutored each other on the same math problems that they later worked on, the tutored math sessions were associated with higher accuracy and rates of performance. Understanding the world through mathematics also helps them develop mental discipline. Mathematics fosters logical reasoning, critical analysis, inventiveness, abstract or spatial thinking, problem-solving aptitude, and even good communication abilities (The Scientific World, 2018).

The researchers came up with this study because mathematics is one of the fundamental subjects that needs to be learned. The goal of the study is to help young people learn how to get along with others so they can do better in school and solve the problem of low-performing students.

2 Methods

The researcher used the descriptive method to answer the problem and obtain objectives put forward on this paper. Descriptive research describes and interprets what is concerned with the condition of relationships that exist, practices that prevail, beliefs process that are going on, effects that are being felt or tend that are developing (Villena 2008).

This process of descriptive method research goes beyond gathering and tabulating data, it involves an element for interpretation of meaning and significance of what is described. Thus, description is often combined for comparison and contrast involving measurement, classification, interpretation, and evaluation. It used to describe characteristics of a population or phenomenon being studied and generally precedes explanatory. Thus, in the present study,

the researcher attempted to assess the influence of teacher managerial styles on the social behavior of pupils. A questionnaire checklist was used to supplement the gathering of data.

2.1 Research design

The researchers used a pretest-posttest design. Choueiry (2022) stated that pretest-posttest design is a type of quasi-experiment that measures two times to get the outcome of interest. In connection with this, the researchers utilize the Pretest-Posttest Design, in which the dependent variable is measured once before the treatment is implemented and once after it is implemented. The purpose of this research is to ascertain the influence of peer tutoring on the mathematics performance of selected grade 6 students. The researcher could measure the performance of students at a particular elementary school for one week, implement the peer tutoring program during the next week, and finally, measure their performance again the following week. The pretest-post-posttest design is much like a within-subjects experiment in which each student is tutored first and then under the learning tutorial condition. It is unlike a within-subjects experiment, however, in that the order of conditions is not counterbalanced because it is typically not possible for a participant to be tested in the treatment condition first and then in an "untreated" condition. If the average posttest score is better than the average pretest score, then it makes sense to conclude that the treatment might be responsible for the improvement. Unfortunately, one often cannot conclude this with a high degree of certainty because there may be other explanations for why the posttest scores are better.

2.2 Research participants and Sampling Procedures

The respondents of this are students of Gregorio Herradura Elementary School who are enrolled in the school year of 2022-2023. The respondents are from grade 6th students, specifically sections are Matipid and Mapagkumbaba. The respondent identified through the use of simple random sampling.

2.3 Sample size, Power and Precision

Purposive sampling is the most widely used probability sampling method, probably because it is easy to implement and easy to analyze. An important benefit of purposive sampling is that it allows researchers to use statistical methods to analyze sample results.

2.4 Data Collection

The researchers attained a deeper analysis on what complications they have encountered during the data gathering and brainstorming. To gather information needed in this study, the proponents used the following methods: Data Gathering. In utilizing this research instrument, the proponents were able to determine the conceivable challenges the proposed study may undergo. The researcher formulates a request letter to ask permission to collect data in Gregorio Herradura Elementary School. The proponents determine the possible problems of the affected grade 6 students at Gregorio Herradura Elementary School. The proponents will conduct the interview with the grade 6 teacher; First is using the most embraced social media application, Facebook Messenger, and lastly is through face-to-face or personal in-touch. Through this data collection method, the proponents also determined the response and the suggestion of the potential users.

Brainstorming is a technique used to identify a list of ideas by holding a group discussion. During brainstorming, the researchers gave their own ideas they have analyzed on the conducted interview with the grade 6 teacher. The information collected resulted in the development of a solution, which assisted them in establishing a strategy called peer-tutoring. The researchers shared ideas and techniques by which effort generates thoughts to have a smooth and excellent outcome of the study.

Consultation. The researchers consulted their adviser and statistician for the study so that they can take any advice or ideas on how to establish better research strategy that will help to achieve the objective of the study.

The data gathered will be treated statistically through the use of slovin's formula and t-test.

Slovin's formula: $n = \frac{N}{1 + e^2}$ where n = sample size N = population size e = margin of error

T-test formula: $t = \frac{m - \mu}{s/\sqrt{n}}$

t = student's t-test

m = mean

μ = theoretical value

s = standard deviation

n = variable set size

3 Results And Discussion

In table 1, at pretest, 61 students have an average score of 1.6964 out of 4 questions in critical thinking with a standard deviation of 1.0255. By this, we can conclude that most of the students are below average when it comes to critical thinking. With an average score of 6.3571 out of 16 questions with a standard deviation of 1.7728, we can also conclude that most of the students are average or slightly above it when it comes to problem solving. With a total of 20 questions, the average score of the students is 8.0536 with a standard deviation of 2.1525, by this we can conclude that most of the students are average.

Table 1: Learner's Mathematics Performance level using Pertest in terms of Critical Thinking and Problem Solving

PRETEST		
	AVERAGE	ST DEV
Critical Thinking	1.6964	1.0255
Problem Solving	6.3571	1.778
Total	8.0536	2.1525

Students require special help in schools concerning their academic problems, especially in mathematics. And one of the intervention models for this is peer tutoring. That has been found to be an effective and inexpensive technique to increase the student's academic achievement (Henson, 2012). One of the instructional strategies that involve each student to help one another is peer tutoring. It is an effective intervention where they can learn through repetition of key concepts regardless of their age, grade level, ability, and disability status (Bowman et al.,).

Table 2: Learner's Mathematics Performance level using Posttest in terms of Critical Thinking and Problem Solving

Posttest		
Critical Thinking	2.6667	1.3077
Problem Solving	7.3659	2.6434
Total	9.6316	2.9630

At posttest after applying slovin's formula, the remaining 42 students who have been tutored got an average score of 2.6667 out of 4 questions in critical thinking with a standard deviation of 1.3077. By this, we can conclude that most of the students are now slightly above average when it comes to critical thinking. With an average score of 7.3659 out of 16 questions with a standard deviation of 2.6434, we can also conclude that most of the students are above average when it comes to problem solving. With a total of 20 questions, the average score of the students is 9.6316 with a standard deviation of 2.9630, by this we can conclude that most of the students are above average.

Peer tutoring strategy brought a positive change in the academic performance of students in mathematics. It is fruitful in increasing the academic achievement of those students who are having difficulties in mathematics. And it is also suggested to use peer tutoring as one of the strategies to secure better results in academics (Annaz,2017).

Table 3: *Learner's Mathematics Performance level in terms of Critical Thinking*

Critical Thinking		
T -Value	Crit Value	Remarks
-4.0441	-2.0195	Significant

After using dependent T test at the scores of the students after pretest and posttest, we got a computed value (T Value) of -0.0441. With a critical value of -2.0195, we can reject the null hypothesis and conclude that peer tutoring can bring a significant difference when it comes to critical thinking.

These findings reveal statistically significant variations in the mean critical thinking scores, according to the outcomes of cognitive ability tests. The study's findings have ramifications for primary school teachers who help students learn to think critically by using various learning experiences. Teachers might continue by thinking about how learning experiences fluctuate depending on the subject matter covered, the order in which students are taught certain abilities, and the variety of learning activities available to foster critical thinking. (Sekar, et.al.,2022).

Table 4: *Learner's Mathematics Performance level in terms of Problem Solving*

Problem Solving		
T Value	Crit Value	Remarks
-3.7617	-2.0195	Significant

After using dependent T test at the scores of the students after pretest and posttest, we got a computed value (T Value) of -3.7617. With a critical value of -2.0195, we can reject the null hypothesis and conclude that peer tutoring can bring a significant difference when it comes to problem solving.

Instructional strategies that promote students' learning in the domain of mathematical problem-solving are a crucial component of mathematics instruction. By examining the impact of a cooperative learning instructional style on students' mathematics problem-solving, where kids with special needs are taught alongside their peers, their study intends to advance prior studies. The intervention combines a cooperative learning approach with teaching in problem-solving techniques, including geometric, proportional, and mathematical models of multiplication and division. The intervention had a significant impact on students' performance in both general problem-solving and geometry-specific problem-solving, according to the results. On the chosen tests of mathematical problem-solving, the children who scored higher on social

acceptance and friendships for the pre-test also scored higher. The cooperative learning approach may therefore result in improvements in mathematical problem-solving, Lang, N. et.al.,2019).

Table 5: *The Result of Peer Tutoring on Enhancement of Mathematics Performance of Grade 6 Students*

Total		
T Value	Crit Value	Remarks
-5.6803	-2.0195	Significant

After using dependent T test at the scores of the students after pretest and posttest, we got a computed value (T Value) of -5.6803. With a critical value of -2.0195, we can reject the null hypothesis and conclude that peer tutoring can bring a significant difference to the combined result of critical thinking and problem-solving test.

Peer tutoring has an impact on the academic achievement of the students. It is one of the effective instructions for teaching that gives positive feedback on students' motivation, social skills and especially in learning. Peer teaching allows students to develop their creativity and problem-solving skills because of its interactive nature. And for the tutor peer-teaching helps them to understand the tutees' mental level and concept about the topic (Ullah et al., 2018).

4 Conclusion

The researchers chose the Grade 6 Elementary students at Gregorio Herradura Elementary School, located at Victoria, Laguna. Pretest and Posttest were used to gather the necessary information for the research. It was developed to determine if peer tutoring influences enhancing the mathematics performance of the students. The mathematics performance of the students was based on their Mean, Percentage, Score in their Diagnostic Test and Periodical Examination in the First Quarter. For a total of 20 questions, students have a mean score of 8. 0536 with a standard deviation of 2. 1525, so we can conclude that most students are average. On the posttest, after applying Slovin`s formula, the remaining 42 students received a mean score of 2. 6667 from the four critical thinking questions with a standard deviation of 1. 3077. With a total of 15 questions, the student's average score is 9.6316 with a standard deviation of 2. 9630. On computed value (t score) - 0.0441 was obtained after applying for a t-test based on the student's pretest and posttest results. The critical value is -2. 0195, you can reject the null hypothesis and conclude that one-on-one tutoring can make a big difference in critical thinking. A calculated value (t score) of -3.7617 was obtained after using a t-test that relied on the students' pretest and posttest scores. With a critical value of - 2.0195, we can reject the null hypothesis and conclude that pairwise tutoring can make a big difference in problem solving. A calculated value (t score) of -5.6803 was obtained after using a t-test that relied on the student's pretest and posttest scores. With a critical score of - 2.0195, we can reject the null hypothesis and conclude that peer tutoring can make a significant difference to the combined critical thinking and problem- solving test scores.

Based on the findings of the study, the following conclusions were drawn: The researchers found out that after using T-tests in pretest and posttest scores, there is a relationship between the two, and in terms of critical thinking and problem solving, it can be inferred that there is a significant effect between the two. There is a significant relationship between the pretest and posttest scores in the mathematics performance of the grade 6 students in Gregorio Herradura

Elementary. School. Based on the conclusion made, the following recommendations are being constructed: It was recommended that peer tutoring should continue to achieve good performance in mathematics by building an active and cooperative learning environment to increase participation, motivation, and student engagement. Tutors must continue to have a good relationship with their tutees for good mathematics performance. The next research can add information using other types of peer tutoring that can be recommended for their future studies.

5 Declarations

5.1 Competing Interests

The authors declare that they have no conflict of interest.

5.2 Publisher's Note

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