

Research Article

Improving students' ability to understand mathematical concepts through peer tutor type cooperative learning models in PP. Syariful Hidayah

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ABSTRACT

The purpose of this study was to determine the increase in mathematics learning outcomes through peer tutor type cooperative learning models in class IX.1 PP students. Shariful Hidayah. This study used three rounds of classroom action research. Each round consists of four stages: design, activity and observation, reflection, and revision. The target of this research is class IX.1 PP students. Shariful Hidayah. The data obtained is in the form of formative test results, observation sheets of teaching and learning activities. From the results of the analysis it was found that the learning outcomes of students experienced an increase from the pre-cycle, cycle I to cycle II, namely, pre-cycle (53.52%), cycle I (70.67%), and cycle II (79.74%). The conclusion of this study is that the peer-tutor-type cooperative learning model has a positive effect on the learning outcomes of PP students. Syariful Hidayah, as well as this learning method can be used as an alternative to learning mathematics.

Keywords: Cooperative peer tutor type; Mathematics and Learning; Outcomes

1. INTRODUCTION

Mathematics is a universal science that underlies the development of modern technology and is important in various disciplines and develops human thinking power. In everyday life mathematics plays an increasingly significant role. However, if you look at the teaching of mathematics in both elementary and secondary schools, it is still far from expectations. The aim is to prepare students to be able to deal with changing circumstances and be skilled and capable of responding to them. While learning is a set of actions designed to support the learning process of students, taking into account extreme events that contribute to a series of internal events that take place experienced by students. (Winkel in Siregar and Hartini Nara, 2010). Achieve the minimum completeness criteria that have been set, namely 75, as follows: students who get scores above/equal to 75 are only 18 people with a percentage of 51.43%. And students who scored less than 75 totaled 17 people. This figure is still far from the expected indicator of success, namely 85% of students who score above 75. In fact, in carrying out teaching and learning activities, teachers are still dominant in applying conventional learning processes (Trianto, 2009). In the conventional learning process, the classroom atmosphere tends to be teacher-centered so that students become passive.

Based on this definition, the learning process in class tends to be monotonous which causes low learning outcomes. Whereas according to (Wena, 2009) the use of strategies in learning activities is to facilitate the learning process so as to achieve optimal results. In line with the opinion above, Dick and Carey (in Sanjaya, 2008) also stated that the learning strategy is a set of learning materials and procedures that are used together to generate learning outcomes for students. According to observers as a subject teacher in PP. Syariful Hidayah that the learning process in schools tends to be centered on the teacher, where the teacher only gives or transfers information or knowledge to students, so that students only receive it passively. Sometimes students answer the questions correctly but they cannot reveal the reasons for their answers. In students can use the formula but do not know where the formula comes from and why the formula is used. Such a situation may occur because in the learning process students are not given the opportunity to express ideas and reasons for their answers. As a consequence, students become inactive in learning and this also has an impact on learning outcomes for students who on average have not yet reached the KKM score of 75. For this reason, the teacher must think about which strategy is the most effective and efficient that can help students In achieving the goals that have been formulated, the right selection is directed so that students can carry out optimal activities. One of them is using active learning strategies, cooperative learning systems with pair learning techniques, in the learning process, especially in mathematics.

According to Trianto (2009) Cooperative learning arises from the concept that students will find it easier to find and understand difficult concepts if they discuss with their friends. Students routinely work in groups to help each other solve complex problems. The purpose of forming these groups is to provide opportunities for all students to be actively involved in thinking processes and learning activities. While working in groups, the task of group members is to achieve learning mastery. With this responsibility, peer tutors also have the right to receive additional lessons from the teacher, including the right to read and borrow all the books used by the teacher and other books. Based on the description above, the authors are interested in conducting research on "Efforts to Improve Mathematics Learning Outcomes Through the Cooperative Learning Model of the Peer Tutor Type in Class IX.1 PP students. Shariful Hidayah".

Based on the description above, the problem formulation in this study is: how to increase the results of learning mathematics through cooperative learning models of the peer tutor type for students in class IX.1 PP. Syariful Hidayah? In accordance with the formulation of the problem that has been stated above, the aim of this research is to find out the increase in mathematics learning outcomes through the peer tutor type cooperative learning model for students in class IX.1 PP. Shariful Hidayah. The implementation of classroom action research is very beneficial for students to improve learning outcomes, learning process activities for students so that they can increase students' understanding of the importance of evaluating various government systems. In essence, in the educational process in schools, learning is a component of educational science with regard to the goals and references of interaction materials. The success or failure of educational goals depends on how the learning process experienced by children as students. Morgan (in Syaiful Sagala, 2009) says that learning is any relatively permanent change in behavior that occurs as a result of training or experience.

Many efforts have been taken to improve the quality of the country's education, starting from conducting training to improve the quality of teachers, renewing the curriculum and improving school facilities and infrastructure. Mathematics is a science that is needed to train logic in thinking and elaboration skills (Anggriyani et al. 2021). In mathematics, the description of a term is carried out carefully, accurately and accurately by utilizing the use of many symbols and the language of symbols about ideas rather than sounds (Andriani, Suastika, and Sesanti 1970). Mathematics has theories and concepts that are appropriate in everyday life (Khairani and Febrinal 2020). Regularity in learning and understanding mathematics needs to start from the simplest, intermediate, to difficult knowledge (Susdarwono 2020). According to Wati in (Ritonga, Julyanti, and Hasibuan 2021) In learning mathematics students are not only taught to memorize mathematical formulas but also to solve problems using mathematics related to mathematics around their lives. Skills in creative thinking are level skills. high or also called High Order Thinking. High Order Thinking. is part of the 2013 curriculum goals that are mandatory for students to master (Gais and Afriansyah 2018). One of the skills that is considered important for students is mathematical thinking skills (Pangestu and Hasti Yuniarta 2019). Mathematical creative thinking ability is the ability to think with the aim of creating or discovering new ideas that are different, not common, original that brings definite and precise results (Abidin, Rohaeti, and Afrilianto 2018). The ability to think creatively in mathematics means that it can be said to be an effort of a learner to be able to find solutions through alternative ideas/ideas in solving or solving problems related to mathematics (Faelasofi 2017).

Sudjana (1999) argues "Learning outcomes are abilities possessed by students after they receive their learning experience. According to Dimiyati and Mudjiono (2006) that learning outcomes are the result of an interaction of teaching or learning. From the teacher's point of view, the act of teaching ends with the process of evaluating learning outcomes. Mathematics is expected to form critical, creative, honest and communicative attitudes in students (Depdiknas, 2004). "Model can be interpreted as a conceptual framework that is used as a guide in carrying out activities" (Sagala, 2010). "The learning model can be interpreted as a conceptual framework that describes and describes systematic procedures in organizing learning and learning experiences to achieve certain learning goals, and serves as a guide for teaching planning for teachers in carrying out learning activities" (Sagala, 2010). Cooperative learning (Cooperative Learning) is a learning model in which students study in small groups that have different levels of ability (Ibrahim 2009). According to Lie, cooperative learning is a teaching system that provides opportunities for students to work with fellow students in structured tasks. On the other hand, according to Slavin, cooperative learning is a learning model in which students learn and work collaboratively in small groups whose members consist of 3 to 5 people, with a heterogeneous group structure. Peer tutor type cooperative learning strategy is a learning model that prioritizes models of cooperation between students in a group to achieve common goals that will be guided by peers who have good achievements. For children who have feelings of fear or are reluctant to ask the teacher, they can ask their friends directly without fear, because with their friends, they will feel happy

2. RESEARCH METHOD

This research is included in the type of classroom action research (CAR). The main characteristic of classroom action research is that there are certain actions to improve and enhance the learning process in the classroom. The classroom action research used was participant research in which the researcher was directly and fully involved in the research from the beginning to the end of the study. This research was conducted in PP. Syariful Hidayah, this school was chosen as a place for research because the researcher is a mathematics teacher at the school. The time for this research to be carried out was from September to November for the 2022/2023 school year, because in this school year researchers are mathematics teachers in PP. Syariful Hidayah, the subject matter presented was "Strategic comparison". The subjects referred to as action in this study were class IX.1 PP students. Syariful Hidayah, totaling 35 students. They were students of class IX.1 semester I for the 2022/2023 academic year, while the participants involved in this study were class teachers and other colleagues. The indicator of the success of this study was using the results of the KKM benchmark learning value of 85% and there had been an increase in students' motivation and interest in learning mathematics. This study uses a class action

research method (CAR). This is adapted to the characteristics of classroom action research, namely the problems to be solved originate from problems of learning practice in class or depart from factual practice problems. This classroom action research model refers to the Kemmis and MC Taggart models which describe that action is described as a dynamic process from the aspects of planning, action (*implementation*), observation (*observation*), reflection. Data collection in this study was carried out using field note techniques, student worksheets, written tests.

3. RESULTS AND DISCUSSION

3.1 Results

Table 1. Recapitulation of Pre-Cycle Test Results

Descriptions	Pre-Cycle
Average test score	77.00
The number of students who complete learning	19
The number of students who do not complete learning	16
Percentage of learning completeness	51.43
Percentage of incomplete learning	48.57

Based on **Table 1**, it can be seen that students whose scores reach the minimum completeness criteria that have been set are 75, as follows: students who get scores above/equal to 75 are only 19 people with a percentage of 51.43%. And students who scored less than 75 totaled 16 people. This figure is still far from the expected indicator of success, namely 84% of students who score above 75.

Table 2. Recapitulation of average test results in cycle I

No.	Descriptions	Cycle I
1	Average test score	75.05
2	The number of students who complete learning	25
3	The number of students who do not complete learning	10
4	Percentage of learning completeness	68.65
5	Percentage of incomplete learning	34.29

Based on **Table 2**, it can be explained that by applying learning using the peer tutor type cooperative learning model, the average value of student learning outcomes is 75.05 and learning completeness reaches 68.65% or only 25 students out of 35 students who have completed learning. These results indicate that in the first cycle classically the students have not completed 40.38% which is smaller than the desired percentage of completeness which is equal to 86%. This is because students are still not able to adjust to the new learning model and teachers do not train students' cooperative skills in learning activities.

Table 3. Recapitulation of average test results in Cycle II

No.	Descriptions	Cycle II
1	Average test score	80.25
2	The number of students who complete learning	34
3	The number of students who do not complete learning	1
4	Percentage of learning completeness	79,74
5	Percentage of incomplete learning	12.54

Based on **Table 3**, the average value of the formative test is 80.25 from 35 students who have completed 34 students and 1 student has not yet achieved learning mastery. So classically the learning completeness that has been achieved is 79.74% (including the complete category). The results in cycle II experienced a better improvement than cycle I. The increase in learning outcomes in cycle II was influenced by an increase in students' ability to learn the subject matter that had been applied so far. This is influenced by the teacher's ability to manage the teaching and learning process during ongoing learning activities. Based on the results of this study, it shows that learning using peer tutor cooperative learning models has a positive impact in improving student learning outcomes. This can be seen from the increasingly solid understanding and mastery of students towards the material that has been conveyed by the teacher so far the learning completeness has increased from the learning outcomes before the action and after the action, namely; pre cycle (53.52%), cycle I (70.67%), and cycle II (79.74%). In cycle II the classical learning completeness of students has been achieved and has experienced a very good increase.

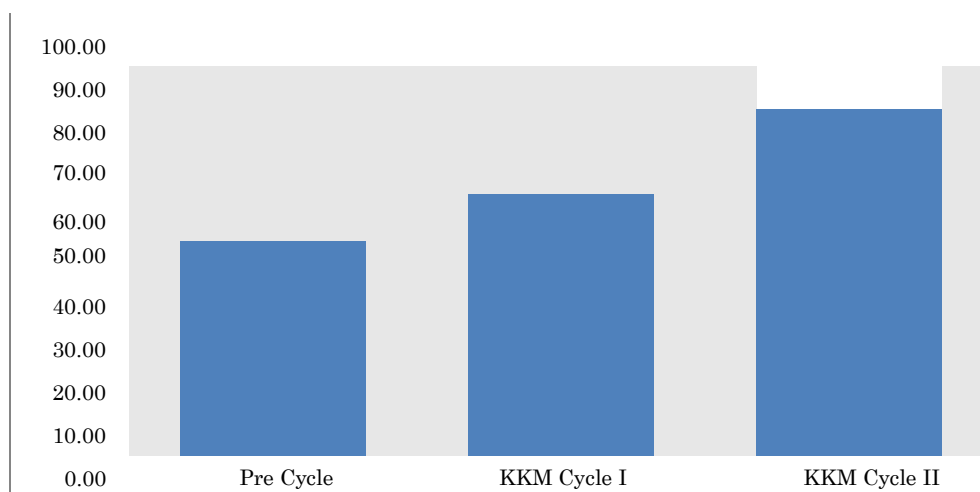


Figure 1. Diagram of Learning Outcomes Before Action and After Action

4. CONCLUSION

Learning using the peer tutor type cooperative learning model has a positive impact on improving student learning outcomes which is marked by an increase in student learning mastery in each cycle, namely pre-cycle (53.52%), cycle I (70.67%), and cycle II (79.74). The application of learning using the peer tutor type cooperative learning model has a positive effect, which can improve student learning outcomes as indicated by the observations that the observer teacher sees, and students are interested in using the peer tutor type cooperative learning model so that they become motivated to learn. To carry out learning requires adequate preparation.

AUTHOR'S CONTRIBUTIONS

The authors discussed the results and contributed to from the start to final manuscript.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

REFERENCES

- Abidin, Jenal, Euis Eti Rohaeti, and M Afrilianto. (2018). "Analysis of the Mathematical Creative Thinking Ability of Grade VIII Middle School Students in Building Spatial Materials." *JPMI (Journal of Innovative Mathematics Learning)* 1(4): 779
- Anggriyani, Ike et al. (2021). "Increasing Students' Memory of Learning Mathematics Using Mnemonic Techniques in Xi Mas Al-Barakah Classes." *Journal of Innovative Mathematics Learning* 4(3): 657-66.
- Susdarwono, Endro Tri. (2020). "Improving Elementary School Students' Ability in Solving Mathematics Mastering 4 (Four) Basic Procedures of Arithmetics To Improve Basic School Students' Ability in Completing Mathematics Problems." *Sigma Journal of Learning and Mathematics (JPMS)* 6(2): 72-84.
- Ritonga, NUR Jannah, EVA Julyanti, and Rosmidah Hasibuan. (2021). "Increasing Student Creativity in Solving Circle Essay Questions for Grade VIII MTsS Pp Irsyadul Islamiah Tanjung Medan Increasing Student's Creativity in Solving Essay Questions Through Problem Solving Approach On The Circle Material For 8 Th Grade M." 7(2): 85-89.
- Gais, Zakkina, and Ekasatya Aldila Afriansyah. (2018). "Analysis of Students' Ability in Solving High Order Thinking Problems in View of Students' Initial Mathematical Abilities." *Mosharafa: Journal of Mathematics Education* 6(2): 255-66.
- Faelasofi, Rahma. (2017). "Identification of Mathematical Creative Thinking Ability on the Subject of Opportunity." *JURNAL e-DuMath* 3(2): 155-63.
- Ministry of Education and Culture. (2004). *College Library Guidelines*. Jakarta : Ministry of Education and Culture
- Abraham. (2009). *Elementary School Quality Improvement Management: From Centralization to Decentralization*. Indonesia, Jakarta: Earth Script.

- Sagala, Saiful. (2009). *Kemampuan Profesional Guru dan Tenaga Kependidikan*. Bandung: Alfabeta.
- Sagala, Saiful. (2010). *Konsep dan Makna Pembelajaran*. Alfabeta: Bandung
- Siregar, Eveline and Hartini, Nara. (2010). *Teori Belajar dan Pembelajaran*. Bogor: Ghalia Indonesia
- Sudjana, Nana. (1999). *Penilaian Hasil Proses Belajar Mengajar*. Bandung: Roesdakarya
- Trianto.(2009). *Mendesain Model Pembelajaran Inovatif-Progresif: Konsep, Landasan, dan Implementasinya pada Kurikulum Tingkat Satuan Pendidikan*. Jakarta: Kencana Prenada Media Group.
- Trianto. (2010). *Merancang Model Pembelajaran Inovatif-Progresif*. Jakarta: Kencana.
- Sanjaya, Vienna. (2008). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Jakarta: Kencana Prenada Media.