



Application of Cooperative Learning Model With Type of Two Stay Two Stray to Improve Results of Mathematics Teaching

Kholilah Amriani Harahap^{a*}, Edy Surya^b

^{a,b}Mathematics Education Of PostGraduate School, State University of Medan, Indonesia

^aEmail: kholilahamriani@ymail.com

^bEmail: edy_surya71@yahoo.com

Abstract

The purpose of the research to improve learning outcomes mathematics junior high school students on the material Tangent Circles by applying cooperative learning model Two Stay Two Stray. This research is a classroom action research (action research) were adopted from the model Kurt Lewin. The subject of this research is the students of class VIII SMP Muhammadiyah 57 Terrain totaling 38 students, consisting of 23 male students and 15 female students and the object of the study is the result of students' mathematics learning by implementing cooperative learning model Two Stay Two Stray. The findings in this study show the students experienced some difficulty in resolving the matter, but with the implementation of cooperative learning model Two Stay Two Stray be easier for students in the learning process because students can share information, thus increasing the results of students' mathematics learning with the percentage of first cycle obtained 52, 63% and 86.84% in the second cycle.

Keywords: the results of learning; cooperative learning; two stay two stray.

1. Introduction

In the world of education today can be understood that the students learn the same way. Build 90% to 10% cognitive affective.

* Corresponding author.

Moreover, learning materials taught with regard to the learning of mathematics, one of the subjects oriented thinking skills (cognitive) students. With such conditions, Paulo Freire says that the school has done 'pedagogy of the Oppressed' towards their students. Where teachers teach, students are taught, teachers and students to understand everything do not know anything, the teacher thinks and the students thought, the teacher talks and the students listen, teachers and students to discipline disciplined [1].

Mathematics is a subject that is always a cause for the student as a complex subject, because it has a lot of formulas and is not considered influential in the lives of students. Shuaibu asserts that mathematics is the main tool to understand and explore the world of economics and social science [2]. It is also seen as an important subject, and for important connections in various fields such as natural sciences, engineering, medicine, and social sciences [3]. Usman argues that mathematics is a subject penetrated into all aspects of human endeavor and have been described as life in the study of various disciplines [4].

Based on the results of interviews to teachers of mathematics VIII-B Ibu Fitri Wahyu Siregar, S.Pd in SMP Muhammadiyah 57 Medan on mathematical learning when the 1st half, especially in the VIII-B, from 38 students most students did not master the material, there are only a few students are considered to be able to master. This suggests that the results of students' mathematics learning is still relatively low. Anni explains that "learning outcome is obtained learner's behavior changes after a learning activity"[5]. Results of learning has an important role in the learning process. The process of assessment of learning outcomes can provide information to teachers about student progress in an effort to achieve learning goals through learning activities. One that leads to lower students' mathematics learning outcomes because many students do not understand the mathematical concepts that are taught by the teacher.

In teaching, teachers must be good at using strategies wisely and prudently and not haphazardly that could harm students. A result-oriented methods to increase student achievement and interest in mathematics is a cooperative learning that has been found to produce better results than the traditional method among students in secondary schools around the world [6]. Watson in his paper stated that cooperative learning is the classroom learning environment that allows students to work together in a small group of heterogeneous and tasks [7]. academic On the other hand according to Johnson & Johnson, cooperative learning is the interaction that involves students working in teams to achieve common goals [8]. Additionally, Njoroge & Githua also found the use of cooperative learning in teaching mathematics minimize gender differences in student achievement in mathematics [9]. Teacher training and universities need to emphasize cooperative learning as an effective strategy for teaching mathematics. Education stakeholders should encourage teachers to use these strategies in teaching mathematics so that students share their intelligence, harmoniously, and learn without fear and enjoy math. Therefore in this study learning model used is a model of cooperative learning, by choosing the type of StayTwo Two Stray (TSTS). The use of cooperative learning model TSTS will lead students to be more active to process information both in discussions, frequently asked questions, search for answers, explaining and listening to the material described by a friend, so that the problems of the learning process described earlier will be facilitated [10]. By applying the model lesson students are expected to cultivate knowledge in mastering the material relating to the material Tangent Circle. These Circle Tangent material requires an understanding of the concepts and thoroughness in analyzing. Additionally, with the implementation of cooperative learning model

Two Stay-Two Stray is expected to facilitate students in learning mathematical concepts, especially in the material Tangent Circles, so that difficulties and saturation of the students in the study of mathematics will be reduced and the results of students' mathematics learning will be better.

2. Method

This study uses a Classroom Action Research (CAR), which aims to increase the students' mathematics learning by applying Cooperative Learning Model Two Stay Two Stray in Class VIIIIB totaling 38 students, consisting of 23 male students and 15 female students. The research was conducted in SMP Muhammadiyah 57 Terrain and performed in the second semester is in March-April 2015. Procedures (Cycle) Class Action Research Cooperative Learning Model Two Stay Two Stray conducted in two cycles and cycles of this study refers to the stage by Arikunto is as follows [11]:

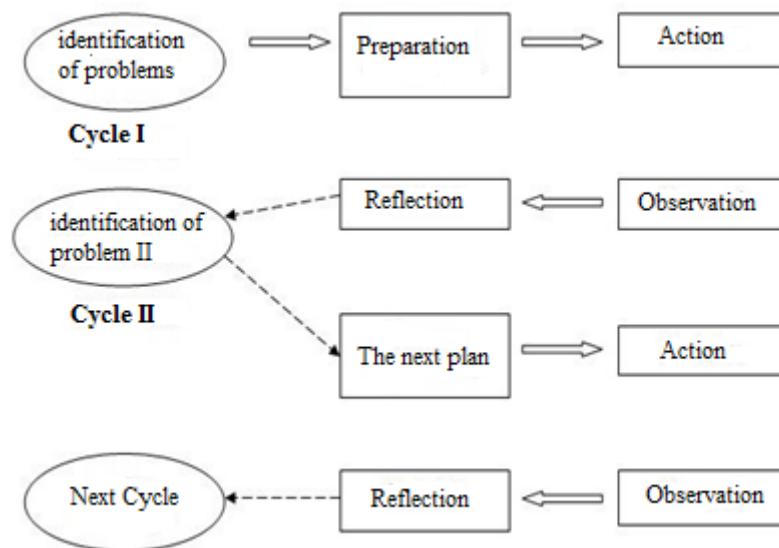


Figure 1: Schematic of Research Procedure

This research is classroom action research with adopted by Kurt Lewin model consisting of four components, namely planning, action, observation, and reflection. Four components form a cycle which can be continued into the next cycle if the result of learning mathematics yet reached a value of completeness, as set out in schools, minimum completeness criteria (KKM) 70%. The data collected in this study is qualitative data that is backed by quantitative data. The qualitative data obtained through interview techniques, while quantitative data obtained through written tests.

Instruments in this study consisted of an instrument of learning and research instruments. Learning instrument includes lesson plans and worksheets, while the research instruments include pre-test and post-test. Steps of cooperative learning model using the type Two Stay Two Stray, which deliver learning indicators to be achieved. Provide information about the procedure, dividing the students into groups of four people to work on the booklet.

Two people from each group visit with other groups, while two people staying firmly in place waiting for two others who came from other groups to visit and share their knowledge. Then call each group to mempresentasikan results of their answers. Then provide an assessment and reward the best results. At the time of learning activities carried out in addition to applying the learning model of observing the student's activity and noted the important things during the learning process.

In this study the implementation of cooperative learning model Two Stay Two Stray used to improve learning outcomes math class students VIIIIB SMP Muhammadiyah 57 Medan on the material tangent to the circle formulated the hypothesis targets of 85% action.

3. Results and Discussions

The data of the research results are presented from before and after applied cooperative learning model type Two Stay Two Stray such as Pre-Test and Post-Test results. Here are the results of students' math learning started Pre-Test:

Table 1: Results of Math Pre-Test

Results	Frequency	Percentage
Completed	9	23.68%
Not Completed	29	76.32%

Based on the level of student mastery can be categorized as follows:

Table 2: Mastery Level Students On pre-Test

Level of Mastery Learning	Category	Frequency	Percentage
(86-100)%	Very High	0	0%
(76-85)%	High	0	0%
(60-75)%	Enough	15	39.5%
(55-59)%	Low	2	5.2%
(0-54)%	Very Low	21	55.3%
Total		38	100%

3.1. Cycle 1

In this cycle given action cooperative learning model Two Stay Two Stray within 2 meetings and the results of students' mathematics learning shows the following:

Table 3: Results Of Mathematics Learning In Cycle I

Results	Frequency	Percentage
Completed	20	52.63%
Not Completed	18	47.37%

Based on the level of student mastery can be categorized as follows:

Table 4: Mastery Level Post-Test In Cycle I

Level of Mastery Learning	Category	Frequency	Percentage
(86-100)%	Very High	0	0%
(76 -85)%	High	7	18.4%
(60-75)%	Enough	21	55.3%
(55-59)%	Low	2	5.2%
(0-54)%	Very Low	8	21.1%
Total		38	100 %

The number of students who completed is 20 people and students in classical learning completeness reached 52.63%.

3.2. Cycle II

In the second cycle given action back and mathematics learning results showed as follows:

Table 5: Results Math In Cycle II

Results	Frequency	Percentage
Completed	33	86.84%
NoCompleted	5	13.16%

In the student's mastery level of Post-Test cycle II are presented below:

Table 6: Mastery Level Post-Test In Cycle II

Level of Mastery Learning	Category	Frequency	Percentage
(86-100)%	Very High	20	52.63%
(76-85)%	High	11	28.94%
(60-75)%	Enough	6	15.8%
(55-59)%	Low	0	0%
(0-54)%	Very Low	1	2.63%
Total		38	100%

From the above data have proved that the completeness of students has exceeded the target of 85% hypotheses action

3.3. Improved Learning Outcomes In Cycle I and Cycle II

Viewed from the completeness of classical study in the first cycle and the second cycle data obtained as follows:

Table 7: Improved Learning Outcomes At the Post-Test In Cycle I and Cycle II

Category	Post-Test In Cycle I		Post –Test In Cycle II	
	Frequency	Percent	Frequency	Percent
Value \geq 70	20	52.63%	33	86.84%
Value <70	18	47.37%	5	13.16%
Average value	63.55		85.13	
Complete classical	52.63%		86.84%	

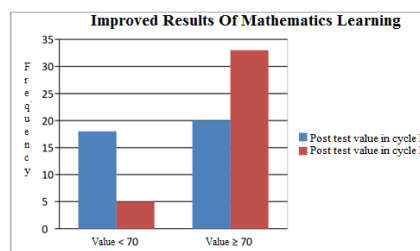


Figure 2: Improved student learning outcomes in the first cycle and the second cycle

From the above data it can be seen that there is an increase in student learning outcomes between the first cycle and the second cycle of the number of students who received grades \geq 70. Based on the results data obtained

showed that the mathematics learning outcomes of students in Pre-Test classified as very low with an average of 51.62 and 23.68% the percentage of completeness. From the results of the Pre-Test found students still have difficulty understanding the questions given, and yet understand the significance of learning. Learning can improve student learning outcomes if they contain kebermanakanaan. This is consistent with the theory of learning Ausubel mentions the lessons learned material to be significant (meaningfull) [12]. It was also necessary to build the capacity of students to improve learning outcomes by applying the learning model. One of these cooperative learning model. In cooperative learning, learners are given the freedom to construct knowledge. Cooperative learning is developed based on Vygotsky's theory of learning. Vygotsky's theory emphasizes the socio-cultural nature of learning and theory Vygotsky believed that the child's interactions with others through language that most strongly affect the level of conceptual understanding can be reached child [13]. It is also in accordance with the opinion Gillies, cooperative learning is a strategy that gives the individual the opportunity to cooperate [14]. A review of the literature on cooperative learning is that beneficial cooperative learning for students both in academic and social. One type of cooperative learning in accordance with these terms is Two Stay Two Stray. This mode will allow students to work alone and in collaboration with others. This is in accordance with Gillies and Ashman found that the children who will be trained to work together and help each other to use more inclusive language of others, and give a more detailed explanation to help one another than children who do not receiving explicit training in this skill [15]. In the first cycle, the students started on measures applied cooperative learning model Two Stay TwoStray,and seen an increase over the initial tests with an average of 63.55 and 52.63% the percentage of classical completeness. But this hypothesis has not reached the target of 85%, even though the students have started to appear active and begin to find out the answers. This is consistent with Piaget's theory of learning believes that every child has the innate curiosity that prompted him to interact with their environment [16]. Looking at the characteristics of students in junior who has curiosity and tend to group so that is quite active, then type Two Stay Two Stray will be one of the strategies for effective learning in student interactions. This is in accordance with the opinion of Wyk that the interaction in the group gives the possibility for students to adapt and accept different abilities with another background [17]. Furthermore, in the second cycle students' mathematics learning outcome has surpassed the target hypothesis of action with an average of 85.13 and 86.84% the percentage of classical completeness. Based on data from student's mastery level, students have initiated the development of the initial test is more dominant in the category of very low, then on the first cycle students are more dominant in the category enough and last on the second cycle students dominant at very high category. This proves cooperative learning model Two Stay Two Stray can help improve the ability to receive and process the information of students. This is because the model of cooperative learning, which is one of its type Two Stay Two Stray allow students to share information with other groups [18][19]. Various studies have shown that cooperative learning a positive benefit for the understanding of the concept and the learning outcomes of students. As research conducted by Bilgin and Geban showed that cooperative learning can enhance students' understanding of the concept [20]. In addition, research conducted Altun showed that cooperative learning can contribute to the development of students' personal and social skills [21]. Then study Tsay and Brady indicated that cooperative learning has a significant effect on student test scores [22] and research conducted by Hossain and Tarmizi shows the cooperative learning can improve students' mathematics achievement and attitudes toward mathematics [23]. Thus the results showed that the implementation of cooperative learning model Two Stay Two Stray able to boost students' mathematics

learning outcomes. Increased ability to receive and process information according to the capacity of working memory, will affect the learning outcome [24].

4. Limitation

Limitations of research through this classroom action research method is to improve the learning outcomes of students taught mathematics and the level of achievement of student learning outcomes with cooperative learning model Type Two stay Two Stray on the material Lines Tangent Circle.

5. Conclusion

The implementation of cooperative learning model Two Stay Two Stray on Tangent Circles material can improve students' mathematics learning outcomes. This is because students can share information through interaction such as a visit. Students can play an active and communicate orally and in writing in the search for answers to the questions. The addition of the second cycle for learning outcomes have not reached the target hypothesis of action 85% in the first cycle and the teachers' teaching activities while conveying the material is still less than the maximum in implementing cooperative learning model Two Stay Two Stray. It is necessary for improvement at this stage of the second cycle is the implementation of cooperative learning model Two Stay Two Stray properly and maximizing the delivery of content that is carefully, clearly and give examples in everyday life.

6. Implication

The research implication that can be obtained is Two Stay Two Stray cooperative learning model (TSTS) can help students to understand the subject matter which is marked by the average value of the students' learning achievement which is increasing. Through the Two Stay Two Stray cooperative learning model (TSTS) students can learn to be enthusiastic in integrating different knowledge and skills that can increase students' courage and activeness. So this learning model can facilitate students in transferring various information and different information to produce the right answer

7. Recommendation

Based on the result and discussion of research could be recommended as follows:

- For the teachers, In teaching mathematics teachers should be able to do learning with Cooperative Learning Model Type Two Stay Two Stray (TSTS) in accordance with the material, especially the material tangent circle, so that students are more active in learning, providing opportunities for students to share ideas and ideas The most appropriate. In addition, it also encourages students to enhance their morale of cooperation.
- For the students, It is expected to be more active in learning, sharing ideas and working together in learning
- For the reachers, Can do research using the same learning model with this researcher, it is suggested to

develop this research with better mastery ability class and can modify this learning model.

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