

The Application of Cooperative Learning of Think-Pair-Share (TPS) Type to Increase the Students' Ability of Problem-Solving

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Abstract—Cooperative learning is one of the learning models that enable students to be active in learning activities. Subjects in this study were 22 students and the object of this research was to increase the students' ability of problem solving by cooperative learning model of think-pair-share type. The research instruments that used were test, observation and documentation. This research was a classroom action research (PTK) consisting of 2 cycles, each consisting of two meetings. From the result of data analysis was obtained the improvement of final test results problem-solving ability. The quantities of students who are able to solve the problem from the initial test were 6 from 22 students with an average score was 49.81. While in cycle II increased to 19 students from 22 students who can solve the problem with the average score was 82.67. Thus it might be concluded that by using cooperative learning model of think-pair-share (TPS) type, the students' ability of problem-solving was increased.

Keywords: *problem-solving ability, think-pair-share.*

I. INTRODUCTION

The progress of science and technology so rapidly today can not be separated from the role of mathematics. Mathematics is a field of study that is studied by all students from elementary to high school and even also in universities. There are many reasons why students need to learn math. According to Cornelius (in Abdurrahman 2010) suggests:

"Five reasons for the need to study mathematics because mathematics is (1) a clear and logical means of thinking, (2) the means to solve the problems of everyday life, (3) the means of recognizing patterns of relationship and generalization of experiences, (4) creativity, and (5) the means to raise awareness of cultural development."

Learning is done mechanically with emphasis on drill or drill exercises by repeating procedures, using certain formulas or algorithms. When students are given different problems with practice questions, they are confused because they do not know where to start.

The reality in the field shows that the mathematics learning outcomes in the aspect of solving math problems is still low. Trianto (2011) suggests that on the other hand empirically based on research analysis of low learning outcomes of learners caused by the dominance of conventional learning process. The pattern of teaching is too much dominated by teachers, especially in the transformation of knowledge to the students. Students are positioned as objects, students are considered not know or do not know anything yet.

In addition, obstacles and shortcomings are often found among the less precise teachers in choosing a model of learning in delivering the material, where in the learning process is still often found the tendency to minimize the involvement of students and teachers often use the same learning model and do not vary. The dominance of teachers in the learning process causes the tendency of students to be more passive so that they wait more for the teacher's offerings than to seek and find his knowledge either through oral or written and his desire to further deepen wasted math so that later the results of student learning mathematics low. In addition, the use of mathematics textbooks has not been well organized, tend to pay attention only to the cognitive development structure of children. There are still many mathematical books that have not been designed as interesting as possible by using interesting and colorful features and have not found various examples through images, posters or

caricatures that are diverse. For that teacher must be able to explain and give concrete example not abstract to student.

Cooperative learning is one of the learning models that enable students to be active in learning activities. This is in accordance with Zakariya's opinion (in Isjoni, 2010) that, "cooperative learning is designed for the purpose of engaging learners actively in learning to discuss conversations with peers in small groups."

From the problems that have been mentioned above, teachers should need to make improvements to the teaching process to improve students problem solving skills. The process of learning to teach good math is the teacher should be able to create an atmosphere that makes students enthusiastic about the learning materials that are underway so that they are able to follow and understand it. One of them is by applying cooperative learning model of Think-Pair-share (TPS).

This model is a form of good cooperation between fellow students and between students and teachers. So often grouping is done in small groups in pairs. With such cooperation, students will be motivated to be visible in completing tasks and can develop students' social skills and thinking skills

With the formation of discussions in study groups can facilitate students in learning mathematical concepts, students can solve difficult problems through a series of discussions in groups. Students will be able to work, develop themselves and take responsibility individually or in groups. Positive competition will occur in the classroom in order to achieve optimal learning achievement.

Based on the background that has been described above, the authors are motivated to conduct research entitled "Application of Think-Pair-share Cooperative Learning Model to improve Problem Solving Ability Mathematics in Class VII Private SMP PAB 10 Medan Estate."

II. METHODOLOGY

The study was conducted at SMP PAB 10 Medan Estate, located at Jln. Mesjid No.1. The subject of this study is all students of class VII-1 SMP PAB 10 Medan Estate which amounted to 22 people and the object of this research was to increase the students' ability of problem solving by cooperative learning model of think-pair-share type.

This type of research is a classroom action research (Classroom Action Research). In accordance with the type, then this research is done through the stages in the form of cycles. In accordance with this type of research is a classroom action research then this research has the stages of this study in the form of cycles.

Suharsimi Arikunto (2010) states that Classroom Action Research is implemented in the form of recurrent cycles in which there are four stages, namely:

1. Planning
2. Implementation of action
3. Observation
4. Reflection.

This study is limited only by two cycles but does not close the possibility to do the next cycle.

III. RESULT AND DISCUSSION

a. Observation of Action (Observation) I

The problems in cycle I were obtained based on the results obtained from the diagnostic tests. The test was given to grade VII students of SMP PAB 10 Medan Estate as subject in this research which amounted to 22 students, which aims to know student ability in solving mathematics problem consisting of 3 problem solving problem with rectangle material and parallelogram

Table 4.1 Observation Level of Student Ability on Diagnostic Tests

Percent	Ability Level	Student	Percentage of Students	Average Problem Solving
90 – 100	Very High	0	0%	(49,81%) Very Low
80 – 89	High	0	0%	
65 – 79	Sedang	6	27,27%	
55 – 64	Low	4	18,18%	
0 – 54	VeryLow	12	54,54%	

From table 4.1 shows that on diagnostic tests there are some obstacles experienced by students in solving the problem are:

1. Students have not been able to understand the meaning of the problem in determining what is known and what is asked from the given problem.
2. In the plan to develop problem solving, students have not been able to apply appropriate strategies and procedures to solve the problem.
3. Students are less careful so wrong in doing calculations.
4. Students are still difficult to draw conclusions.

Based on preliminary test results concluded that students are still not able to solve the problem of problem solving problems of mathematics students. The students' math problem solving ability in diagnostic test is still low, it is seen from the average of the students' mastery around (49.81%) and no students (0%) are categorized with very high ability level and many obstacles faced by students in doing diagnostic tests. Recognizing this requires an effort to improve the ability of students in solving mathematical problems that can be applied in everyday life. Efforts that can be made to improve it is by applying the Think-Pair-share (TPS) Co-operative model of learning.

b. Analysis of Learning cycle I

Table 4.2 Description Student Ability Levels of Cycle Mathematics Problem-solving Ability Test I

Percent	Ability Level	Student	Percentage of student	Average Problem Solving Skill
90 – 100	Very High	3	13,63%	39,49 (72,16%) Sedang
80 – 89	High	8	36,36%	
65 – 79	Medium	4	18,18%	
55 – 64	Low	3	13,63%	
0 – 54	Very Low	3	13,63%	

From table 4.2 shows that from the result of the students' mathematics problem solving test given to 22 students, 3 students (13,63%) with very high ability level, 8 students (36,36%) with high ability level, 4 students (18,18%) with medium ability level, 4 students (18,18%) with low ability level, and 3 students (13,63%) with very low ability level. The average problem solving ability is 39.49 (72.16%).

Overall, the student's ability level to solve the problem on the problem solving test I was low with an average score of 34.64 (72.16%). The number of students who can solve the problem that has reached the level of ability is very high, high, and medium as many as 15 students from 22 students or 68.18%.

Table 4.3 Description of the Observation Results Teachers do Learning in Cycle I

Activity	Part I	Part II
teacher gives an explanation of the learning objectives to be achieved	3	3
Teachers motivate students by conveying the benefits of learning the subject matter on other disciplines and in everyday life	2	3
Teachers remind students of pre-requisite materials that have been previously owned	2	2
Teachers convey information relating to the content of the subject matter	2	2
Teachers provide opportunities for students to demonstrate or communicate their learning outcomes	3	3
Teachers monitor, guide and assist students in completing the LAS	1	2
Teacher guides the students to discuss the exercises	2	3
Teacher guides the students to conclude the material they have learned	3	3
Teacher give rewards to students	3	3
Total	21	23
Average	2,33	2,56
Average Cycle I	2,445	

From table 4.3 shows that Based on teacher observation in cycle I, it is found that teachers have not been able to improve the implementation of learning by applying cooperative learning. This can be seen from the observation.

c. Exposing Data

Based on the results The ability of students in solving the problems in cycle I included in the high category with the average score of 72,16. Students who have been able to understand the problem as many as 15 students (68.18%) are in the category of minimum "Low", while students who are not able to understand the problem as many as 7 students (31.82%) are in low category and very low, but has not reached the target of understanding students' problems classically that is 85%. The action continues into the next cycle.

d. Observation of Action (Observation) I

From the results of the students' math problem solving skills test given to 22 students, 7 students (31.81%) with very high ability level, 11 students (50%) with high ability level, 1 students 4.54%) with moderate ability, 3 students (13.63%) with low ability level, and 0 students (0%) with very low ability level. The average problem solving ability is 39.68 with the percentage (82.67%) with high ability level.

e. Analysis of Learning cycle II

Table 4.4 Description Student Ability Levels of Cycle Mathematics Problem-solving Ability Test II

Percent	Ability Skill	Student	Percentage of student	Average Problem Solving Skill
90 – 100	Very High	7	31,81%	39,68 (82,67%) Tinggi
80 – 89	High	11	50%	
65 – 79	Medium	1	13,63%	
55 – 64	Low	3	4,54%	
0 – 54	Very Low	0	0%	

From table 4.4 shows that the students' ability level to solve the problem on the ability problem II is high with an average of 39.68 (82.67%). The number of students who have been able to reach the level of ability is very high, high, and medium as many as 19 people Students from 22 students or 86.36%. This has worked.

Table 4.5 Description of the Observation Results Teachers do Learning in Cycle II

Activity	Part I	Part II
teacher gives an explanation of the learning objectives to be achieved	3	3
Teachers motivate students by conveying the benefits of learning the subject matter on other disciplines and in everyday life	2	3
Teachers remind students of pre-requisite materials that have been previously owned	2	3
Teachers convey information relating to the content of the subject matter	3	3
Teachers provide opportunities for students to demonstrate or communicate their learning outcomes	3	3
Teachers monitor, guide and assist students	3	3

in completing the LAS		
Teacher guides the students to discuss the exercises	3	3
Teacher guides the students to conclude the material they have learned	2	3
Teacher give rewards to students	3	3
Total	24	27
Average	2,67	3
Average Cycle I	2,835	

From table 4.5 shows that the results of teacher observation in cycle II, it was found that teachers have been able to improve the implementation of learning by applying cooperative learning. This is evident from the results of observations in cycle II that increased from the observation in cycle I. Implementation of teaching and learning process conducted by teachers in cycle II is also already maximal with the average is at intervals of 2.2 to 3.1 included in the category good.

f. Exposing data

From the results of students' math problem solving skills tests have improved from the initial test. This can be seen from the average improvement of students' math problem solving ability from initial test that is 23,90 (49,82%) with very low ability level to 34,64 (72,16%) with medium ability level in cycle I become 39 , 68 (82,67%) with high ability level in cycle II.

After the implementation of Think-Pair-Share type of Cooperatit model, the steps in solving student problems are students' ability to understand the problem, plan the completion, carry out the completion and ability of the students to check their work also increase from cycle I to cycle II. There is an increase in the average grade obtained by the students. The average grade obtained by the students at the problem solving test I was 72.16 while in the problem solving ability test II the average value obtained was 82.67.

IV. CONCLUSION

Based on the results of research and discussion can be concluded that the application of Think-Pair-Share Co-operative Model (TPS) by using LAS can improve students' mathematical problem solving skills in solving material problems BangunDatarSegiempat in class VII PAB 10 Medan Estate. This can be derived from the students' initial test obtained by 6 students (27.27%) with the grade grade 49.81 in the category of problemsolving ability is very low. The students' ability to solve mathematical problems classically increased by 24.55 in cycle I 15 students were able to solve the problem (68.18%) to 19 students (86.36%) in cycle II and the average grade experienced an increase of 10.51 in the cycle I 72.16 to 82.67 in cycle II. Similarly, the teaching and learning process by applying Think-Pair-Share (TPS) learning using LAS takes place well. Based on the observations made by mathematics teachers SMP PAB 10 Mesdan Estate can be seen from the results of learning

activities in cycle I meeting I 2.33 and meeting to II 2.56 with an average of 2.445 (good category) in cycle II increased to meeting I 2,67 and meeting to II 3 with an average of 2,835 (good category) in cycle II.

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