Efforts to Improve Student Learning Outcomes through Cooperative Learning Based on Team Assisted Individually (TAI)

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Abstract: *The purpose of this research is to know the difficulties faced by students in studying the subject of cubes and beams. This study also aims to determine the improvement of student learning outcomes after the implementation of cooperative learning model type based on Team Assisted Individually (TAI). This type of research is classroom action research. In this study divided into two cycles. Before being given an action, the average initial student test result is 66.75 with 55% classical completeness. After given cooperative learning type TAI, the average test result of student's learning I was 76,75 with 77,50% classical completeness. And after the second action is given in cycle II, obtained the average value of the test results of learning II 82.775 with classical completeness of 87.50%. Based on the result of the research, it is found that through learning Cooperative Learning Type Team Assisted Individually (TAI) can improve student learning outcomes on the subject of cube and beam.*

Keywords: TAI, Cooperative Learning, Action Research.

1. Introduction

Mathematics is one of the most important Science dominated by humans. Given the very importance of being mastered, mathematics has been introduced to children from an early age. Because by studying the math of all people, especially students can improve and develop the ability, especially in solving problems that will be applied in everyday life.

At the school level, mathematics is one of the compulsory subjects to be given to students. But there are still many students who think mathematics is difficult, so in learning mathematics becomes difficult accepted by students. This results in low student learning outcomes.

Based on the results of interviews with one of the teachers in SMP Negeri 6 Binjai, Sumatera Utara, Indonesia obtained the fact that the results of learning mathematics, especially class VII can be categorized as low. Associated with the low learning outcomes of students, the fact that students are still difficult to understand a concept. Though the concept is a fundamental thing that must be mastered by students. One of the material that is considered difficult for students is the material of cube and beams. Very unfortunate if the concept of cube and beam is not mastered by students, because the concept is in the material Cube and Block is very related and very close to the daily life of students. Students are still having difficulties in identifying the properties of cubes and beams and the difficulty in calculating the surface area and the volume of cubes and blocks. Furthermore, the fact that there are still many students who have a value under the minimum Cumulative Criterio that has been set that is 75. Teachers also recognize that there are many factors that determine the success of a learning process, one of which is an effective learning strategy. During this time teachers are still using ordinary learning models, teachers dominate without actively involving students.

In learning mathematics need to involve students actively, especially on the material Cube and this block, because the concept is very close to the daily life of students. Student experience can be used as a direct application to the material. With a variety of student experiences, it is expected to give a deeper understanding of the concepts of cubes and real blocks. Therefore, here the role of teachers is actively indispensable, namely in motivating students to engage students actively in every learning in school. As revealed by Sutrisno stated that:

"The strategy to improve students' motivation is often a problem for teachers because there are many factors both internal and external that affect student's learning motivation. The teacher applies the principles of student learning motivation in instructional design, ie when choosing strategies and learning methods. "

Based on the above, it is clear that teachers are required to be able to choose a strategy and the right model to improve students' learning motivation so that learning achievement also increases. One of the learning methods that can encourage the improvement of learning motivation and can improve student learning outcomes in solving problems, especially on the subject of Mathematics is a model of cooperative learning type Team Assisted Individually (TAI). In accordance with what Nur said (2006: 55): TAI model is designed and used for programmed learning, such as teaching Mathematics.

Slavin (2008: 190) suggests that:
"TAI is designed so that students are motivated to learn the materials provided quickly and accurately."

Based on the above statement, TAI type learning method is devoted to the teaching of Mathematics. With this type of cooperative learning TAI teachers can teach more effectively and efficiently. With our cooperative teachers can group students into small groups giving them an opportunity to discuss problems encountered, exchange

ideas among students, and debate alternative solutions that can be used.

Based on Mrs. Erna's statement, Mathematics teacher of SMP Negeri 6 Binjai has never used TAI type cooperative learning model in teaching Cubes and Balok subject matter. For that chosen the learning model in accordance with the teaching process that can encourage students' skills in solving the problems of Cube and Beams, one of the appropriate learning model is a model of cooperative learning TAI type.

The TAI type cooperative learning is a combination of individual and group learning. This type of TAI learning can be applied to learning the subject of the cube and beams because by combining students with different experiences and knowledge on cubes and beams in a heterogeneous small group, it is expected to facilitate students to solve problems related to cubes and beams. In addition, with this learning the teacher can do individual teaching to the students who need it.

Based on the background that the authors are interested in conducting research with the title: Improving Student Learning Outcomes through Learning Cooperative Learning Team Assisted Individually Type (TAI) In Problem Solving

2. Research Methods

This classroom action research site is conducted at SMP Negeri 6 Binjai. The subjects of this study are students of class VIII SMP Negeri 6 Binjai with the number of students as many as 40 students. The object of this research is an effort to improve student learning outcomes through cooperative learning type TAI.

Research method in this research is Class Action Research. There are four aspects, which are planning, acting, observing and doing reflection. Instruments used in this study are the test of learning outcomes, teacher observation sheets, student observation sheets, interviews and documentation.

3. Discussion

At the beginning of this study, researchers conducted initial tests on students. From the results of the initial test, obtained 18 students or 45% who achieve a value of <65 and students who achieve the value of ≥65 (completeness of learning) there are 22 students or 55% with the average value of the initial test is 66.75. In addition to the above data also obtained the results of student answers analysis in solving the initial test questions, it can be seen location of errors and difficulties students in solving the problem, namely:
1) Students find difficulty to answer areas in cubes and beams.
2) Students find difficulty to cite examples of objects that resemble cubes and beams.
3) Students find difficulty to answer the elements of the cube.
4) Students find difficulty to answer the elements of the beam.
5) Students find difficulty to describe the cube in the printed area.

6) Students are difficult to describe the 3 cm cube with the base of PQRS.
7) Student is difficult to describe beam with size 5cm x 3cm x 1cm with one side plane is PSWT.
8) Students are less through in putting a vertex.
9) Students are difficult in determining the image which is the web of cubes and beams.
10) Students are difficult to find the surface area of the beam and also wrong in making the unit count.
11) Student is wrong in determining length, width, and height of beam.

After the preliminary tests are given, the results of this test are used in the form of values and analysis of student answers as a reference in the formation of discussion groups, in the provision of action and in the preparation of learning implementation plans to be implemented on learning Cooperative Learning TAI type.

CYCLE I
Implementation of cycle I begins to prepare action plan I. Action plan I prepared based on the above problems, the goal is to overcome difficulties faced by students. Here are the steps taken in action I:
1) Divide students into heterogeneous groups of 5 students based on preliminary results.
2) Provide learning materials that students will learn individually in groups.

Teaching traditional cube and block materials for 10 to 15 minutes traditionally to students by using manipulating concrete objects around students related to cubes and beams, where teaching is designed to help students understand the relationship between cube and block material with real-life problems.

Train students' skills in solving problems and inculcate the concept of cubes and blocks by dividing Exercises paper to each student that will be completed individually and will continue to be discussed in each group.

1) Provide individual assistance to individuals who have difficulty understanding the concept of cubes and beams and in completing the Exercises paper.
2) Calculate student scores.
3) Give appreciation to groups that get good value in working on Exercises paper.
4) At the end of the lesson make the conclusion of learning with the students.

The next step is the provision of action I carried out in accordance with the plan that has been prepared, in which the researcher acts as a teacher in the classroom. Actions that have been done can improve students 'understanding by looking at students' learning outcomes, such as the effort to establish interaction among students seen when working in groups to solve problems and to focus on the results of the discussions in front of the class and other groups respond so as to add information to all students. The presence of individual help is very helpful for the difficult students. In addition, item scores emphasize progress achievement rather than just the correct percentage of answers so as to help students understand the concept of cubes and beams.

Furthermore, student learning outcomes also increased after completion of the implementation of action I. This can be seen from the results of the test I students of the number of students 40 people, there are 31 students who reached the level of learning classical completeness or 77.50% (got the value ≥65) while those who have not reached the level of mastery learn there are 9 students or 22.50%. And the average grade value reached 76.75. In addition to the above values, also obtained the results of student error analysis in completing each item in the test results of learning I, namely:

1) Students are incomplete in mentioning diagonal fields, diagonal spaces and diagonal fields
2) Students are incomplete in mentioning diagonal elements of fields and diagonal fields
3) Students cannot draw cubes
4) Students cannot draw blocks
5) Students cannot describe the beam webs
6) Student is wrong in doing multiplication operation
7) The student is wrong in solving the problem to find the volume of the cube
8) Students are wrong in finding the surface area of the cube if the volume is known
9) Students are wrong in finding the volume of the beam, and students can not equate the unit first.

Interviews were also carried out by the researcher to reassure whether each student's mistake on the results of the results of study I was true of the difficulties experienced by the students. From the interviews it was found that students who were not able to complete the tests correctly due to some things, among others, because many students are embarrassed and dare not ask the teacher to repeat the material that has not mastered and the students did not really follow lesson when the lesson took place, so that at the time tests given the students are unable to complete it. Because there are still students who have not so that the learning process is continued into cycle II. The result of the learning test I is used as a reference in giving action on cycle II.

CYCLE II

Based on the difficulties faced by students from the results of data analysis and interviews conducted in cycle I, then done problem solving. The steps taken in solving the problems in the implementation of this cycle II are:

1) Divide the students into smaller heterogeneous groups, consisting of 3 students based on preliminary test results.
2) Provide subject matter that will be studied students individually in groups.
3) Teach traditional cube and block materials for 10 to 15 minutes traditionally to students, where teaching is designed to help students understand the relationship between cube and block material with real-life problems. Master also prepares props in the form of cardboard-shaped webs of cubes and blocks so as to better attract students.
4) Train students' skills in solving problems and inculcate the concept of cubes and blocks by dividing Exercises paper to each student that will be completed individually and will continue to be discussed in each group.
5) Providing individual assistance to individuals who have difficulty in understanding the concept of cubes and

beams and in completing Exercises paper. If there are students having difficulties, then the student asks a group of friends, so that the student is not ashamed to reveal the difficulty. And if it does not work then the student can ask the teacher.
6) Summarize the lessons learned through question and answer and try to answer the questions even if the answer is not correct.
7) Calculating student scores.
8) Give appreciation to the group that get good value in working on Exercises paper. Giving praise to the students who answer the teacher questions correctly and to the students whose answers are still wrong, the teacher also gives praise for his courage to answer and the teacher explains the correct answer. While the students who are still shy answers, teachers provide motivation and encouragement to want to try. Furthermore, the teacher asked for opinions and impression messages from students about the learning that occurred at the time.

Giving action II is to implement learning cycle II in accordance with the plan that has been prepared, where the researcher acts as a teacher in the classroom. After the learning is done, then the students are given the test of learning result II as evaluation. And from the results of these tests, obtained data that there is an increase in the average value of the class between cycle I and cycle II. In the first cycle, the average value of the class is 76.75 while in cycle II the average grade is 82, 775. Viewed from the completeness of the classical learning cycle I as much as 31 out of 40 students (77.50%) and the second cycle is 38 of 40 students (95%) who achieve learning mastery. This means having reached the completeness of classical learning that is 85%.

From the results of data analysis can be concluded that there is an increase in student ability. This increase occurs after the provision of appropriate action to the difficulties experienced by students in completing the test results of learning. Action in the form of teaching through cooperative learning type learning TAI, where researchers act as teachers who direct and guide students and provide opportunities to learn in groups to solve problems with a group of friends. Then seen from the result of student learning, there are 35 from 40 students who achieve learning mastery or 87.50% and 2 students who have not reached the level of mastery learning not because they do not understand the material of cubes and blocks, but because of inaccuracy. In other words, the value of the classical completeness of the test of learning result I has increased in cycle II by 17.50%.

This type of TAI cooperative research has also been done previously by Ullya that:
"The application of TAI type cooperative learning model to improve the ability of high school students in the first cycle diklus I student mastery level of 73.67% and for the results of cycle II test student mastery level of 82% class".

This show that cooperative teaching type TAI can overcome students' learning difficulties while improving student learning outcomes.

4. Conclusion

Based on the results of the study concluded that:

The students' difficulties in studying the material of cube and beams are (1) the students are difficult in determining the elements of cube and beam such as determining the vertices, ribs, sides / fields, diagonal space, and diagonal fields on cubes and beams, (2) students (3) students have difficulty in making cube and beam nets, (4) students have difficulty in calculating surface area of cube and beam, and (5) students difficult to calculate the volume of cube and beam.

Efforts are made to overcome the problem of students are (1) using props in the form of cartons in groups so that learning is not monotonous, students interact with their friends where the interaction is a positive interaction. Each group member fills in, helps each other, and cooperates with each other, (2) randomly assigns the group to make each group ready to respond so that the group members who are unable to answer indicate that the group is experiencing difficulties. In this case the teacher directs the student to another group to help in finding the answer to the problem, (3) to appoint students directly will create an impression for the student that he / she has answer to the question asked so that the student will spit out the answer they have got and the student will dare to issue his critical thinking ideas to maintain his argument.

Before giving the action, the average score of students 62,28 with 50% classical completeness. After giving first action (cycle I) reach 76,75 with 77,50% classical learning completeness level. because the results obtained do not meet the value of mastery, then proceed on the second action (cycle II). The average value obtained in cycle II reaches 82.78 with 87.50% classical completeness level. This means that through cooperative learning type TAI can overcome student learning difficulties as well as to improve student learning outcomes.

5. Suggestion

1) Cooperative Model TAI type to make learning centered on students and as one effort to improve student learning outcomes.
2) To the students, expected to be more active and cooperate in learning mathematics and willing to re-learn the lesson material that has been studied previously.
3) To the researcher who is interested in doing research with the same object with this research, it is suggested to develop this research by preparing the learning program and better teaching the learning.

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