THE EFFORTS TO INCREASE ACTIVITY AND OUTCOMES OF LEARNING ABOUT MATHEMATICS CLASS XI THROUGH COOPERATIVE LEARNING MODEL TYPE STUDENT TEAMS ACHIEVEMENT DIVISION (STAD)

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ABSTRACT

So far, some think that mathematics is no more than counting and playing with formulas and statistics. The student simply accepts mathematics teaching in school without questioning why, and for what mathematics, and for what match should be taught. This research aims to improve the activities and results in study mathematics by cooperative learning design type student team achievement division (STAD). The kinds of this research are classroom action research (CAR), the research setting is XI IPS I State Senior High School 4 Yogyakarta (SMA Negeri 4 Yogyakarta) Academic year 2016/2017 consisting of 27 students. The data collecting technique is observation and test learning outcomes. The data analysis technique is descriptive qualitative research. This research indicates that by using the cooperative learning design type student team achievement division (STAD), there are improvements in activities and mathematics learning outcomes students in two cycles. This matter seen from the percentage average of observation results of learning activities students in I cycle; it is about 56,51% by enough criteria, and in cycle II are increased become 82,36%. Improvement learning outcomes are seen in cycle I from 27 students who fill up MCC amounted to 15 students in cycle II increased to 23 students who fill up Minimum Completeness Criteria (MCC).

Keywords: learning activities, learning outcomes, cooperative learning.

INTRODUCTION

So far, there are still many who think that mathematics is not more than just counting and playing with formulas and numbers. Students just take the teaching of mathematics in school, without questioning why, and for what mathematics should be taught. Mathematics, as one of the branches of science, which has much basis in the field of physics, has an important role in everyday life, mathematics is used to solve various problems. Besides being useful in everyday life, but not a few who think mathematics is a frightening specter so that this affects the learning of mathematics at school.

Students of SMA Negeri 4 Yogyakarta class XI IPS I have low learning outcomes based on interviews with the mathematics teacher concerned. With an MCC score of 75 determined by SMA Negeri 4 Yogyakarta, there are still many students whose daily test scores and midterm scores are below MCC. During the learning process, the teacher said their motivation to learn was quite high, but during the test, the majority of students got low grades. Many factors cause this. One of them is the factor of students whose activity is low (accustomed to being quiet in the learning process). The teacher factor also affects students because they are accustomed to using lecture learning and assignments and the lack of questions from students, so students only listen.

For this reason, researchers try to replace teacher-centered learning with cooperative learning. According to Abdul Majid (2015: 174-175), cooperative learning is learning activities carried out in groups and carried out through sharing between students to achieve learning objectives. It is expected that cooperative learning can encourage students to be more active so that the learning outcomes of students' acquisition in mathematics are expected to increase. One type of cooperative learning is the STAD (Student Teams Achievement Division) cooperative learning model.

According to Juniati (2009), Activities are all activities carried out either physically or spiritually. According to Paul D. Dierich (in Erma Wulandari and Sukirno, 2012), the classification of student learning activities can be divided into eight groups, namely:

a) Visual activities: reading, looking at pictures, observing experiments, demonstrations, exhibitions, observing others working, or playing.

b) Oral activities: raise a fact or principle, link an event, ask a question, make a suggestion, express an opinion, interview, discuss, and interrupt.

c) Listening activities: listening to the presentation of material, listening to a discussion or group discussion, listening to a game, listening to the radio.

d) Writing activities: writing stories, writing reports, examining essays, coffee materials, making summaries, doing tests, and filling out questionnaires.

e) Drawing activities: drawing, making graphics, charts, map charts, and patterns.

f) Metric activities: conducting experiments, selecting tools, conducting exhibitions, making models, organizing games, dancing, and gardening.

g) Mental activities: pondering, reminding, solving problems, analyzing factors, looking at relationships, and making decisions.

h) Emotional activities: interests, differentiating, brave, calm, etc.

STAD is one of the simplest cooperative learning methods and is the best model for beginners for teachers who are just using a cooperative approach (Slavin, 2016). Using the STAD cooperative learning model in mathematics learning is expected to help students improve results. Learn math. Purwanto (2009: 46-47) argues that Learning outcomes are the achievement of educational goals in students who participate in the teaching and learning process. Learning outcomes are the realization of educational goals' achievement, so the learning outcomes measured are highly dependent on the educational objectives. Furthermore, the stages of the STAD learning model, according to Arifin in Majid (2015: 186-188) teachers must prepare activity sheets and answer sheets that students will study in cooperative groups, then assign students in heterogeneous groups with a maximum number of 4-6 people. Heterogeneity rules can be based on: a) Academic ability (clever, moderate, and low) obtained from previous academic results (initial scores). The division must be balanced so that each group consists of students with balanced levels of achievement. b) Gender, social background, innate pleasure/character (reserved and active), and others. c) Presentation of subject matter

The purpose of this study is 1. To find out whether or not there is an increase in mathematics learning activities for students of class XI IPS I of SMA Negeri 4 Yogyakarta, whose learning uses Student Teams Achievement Division (STAD) cooperative learning models. 2. To find out whether or not there is an increase in the mathematics learning outcomes of students of class XI IPS I of SMA Negeri 4 Yogyakarta, whose learning uses the Student Teams Achievement Division (STAD) cooperative learning model.

METHODS

This type of research conducted by researchers is classroom action research (CAR).
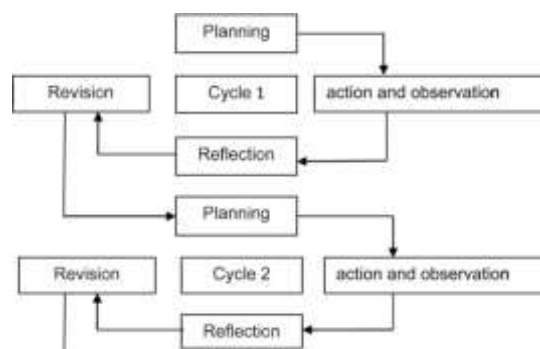

Figure 1. Class Action Research Flow

(Arikunto; 2007:16)

This research was carried out in SMA Negeri 4 Yogyakarta. This research was conducted in the even semester of the 2016/2017 school year. In this study, the research subjects were students of class XI IPS I in the even semester of SMA Negeri 4 Yogyakarta in the 2016/2017 academic year of 27 students. At the same time, the research object is the application of the Student Teams Achievement Division (STAD) cooperative learning model. Classroom action research procedures are described as follows:

1. **Cycle I**

    The planning phase is the preparation phase carried out by the researcher to carry out classroom action research, namely:

    1) Make a lesson plan and Student Worksheets about the material to be taught by the type of cooperative learning model TAI.
    2) Compile and prepare observation sheets related to the learning process to be carried out.
    3) Making research instruments in the form of evaluation tools / diagnostic tests.

    The action taken at this stage is the implementation or application of the plan that has been made in the form of a STAD type cooperative learning model that aims to improve or perfect the previous learning model. The actions carried out are as follows:

    1) The teacher gives an introduction, direction, and motivation to students on the material to be discussed using the STAD type cooperative learning model.
    2) The teacher gives a preliminary test to students to examine the average daily value or the value in the previous chapter obtained by students so that the teacher can know the shortcomings of students and can be used as a guide in group division.
    3) The teacher divides the groups based on test results, the placement of each group with different abilities, and each group consists of 5-6 people.
    4) In each group, there is at least one student who is more familiar with the material so that it can help other students.
    5) The teacher gives the lesson material briefly.
    6) The teacher distributes worksheets to groups that are done individually, and worksheets contain material and some questions related to squares and rectangles.
    7) The teacher assigns each student to bring the results of their worksheets in their groups to discuss the work of worksheets that have been done individually, teach each other friends, and check answers to each other.
    8) The teacher assigns students who can work on the questions in the worksheet to assist students who do not understand because at the end of the meeting a quiz will be held which must be answered by individuals in the group, the group will get a score from the acquisition of each average score individual.
    9) The teacher goes around the classroom to check and provide individual assistance in groups that are experiencing difficulties.
    10) The teacher randomly appoints one individual in the discussion group to present the results of the discussion and conclude the results.
    11) The teacher gives a posttest containing two problem descriptions that must be done by each individual.
    12) At the end of each cycle, the teacher announces the acquisition of each group's score and gives a reward.

    Observation or observation is the procedure of recording data during the learning process. Observations were made by researchers and assisted by other observers, namely mathematics teachers and colleagues who also made observations during the implementation of the learning process that took place using observation sheets that had been prepared previously. These observations were made to find out the course of learning by applying the STAD type cooperative

learning model. The things that were observed were the learning process with STAD type, student activeness, and the obstacles encountered during the implementation of the action. This is to determine the suitability between the implementation of the action and the previously designed plan.

This stage is the stage of research on the process that occurs during the application of the STAD type cooperative learning model in the form of problems that arise and all matters relating to classroom actions that have been carried out. This reflection activity was carried out by conducting discussions with parties involved in the research, namely mathematics teachers. At this stage, the results obtained at the observation and evaluation stage in the form of daily tests and observations that have been collected and then analyzed. Weaknesses or deficiencies that occur in the first cycle will be corrected in the next cycle.

2. **Cycle II**
   1) At the Planning stage, the learning action plan is planned again based on the results of reflection in the first cycle to fix the weaknesses and increase the success achieved in the first cycle.
   2) The implementation of the second cycle's actions is not much different from the implementation of the actions in the first cycle. At this stage also carried out improvements that have been discussed in the reflection of the first cycle to improve student learning activities.
   3) Observations were made during the implementation of learning with the Team Assisted Individualization (TAI) type of cooperative learning model carried out. At this stage, the researcher observes students' activeness, the level of mastery of the material by students, and the obstacles encountered during the learning process. Observations were made using observation sheets that had been prepared.
   4) At this stage, reflection actions are carried out as in cycle I. The activity carried out is a discussion between researchers and the mathematics teacher concerned about everything that happens during the implementation of research during the second cycle. If the research objectives have not been reached, the researcher will proceed to cycle III. However, if the researcher's goals have been achieved, the research is considered complete. Weaknesses and deficiencies in stage II will be corrected in the next cycle.

RESULTS AND DISCUSSION

The following is a summary of the results of observations of student activity:

Table 1. The results of observations of student activity

No	The observed aspect	Percentage	
		Cycle I (%)	Cycle II (%)
1	Physical Activity	73,61	87,96
2	Skill Activity	55,55	83,32
3	Mental Activity	49,99	79,16
4	Emotional Activity	46,91	79

In the table, there are four aspects of student activity from cycle I to cycle II, which in each aspect has increased. In the aspect of physical activity, the increase from cycle I to cycle II was 14.35%. In the aspect of skill activity, the increase from cycle I to cycle II was 27.77%. The aspect of mental activity from cycle I to cycle II was 29.17%. The aspect of emotional activity increased from cycle I to cycle II was 32.09%.

Students also gave a positive response to cooperative learning with the STAD type. The increase in the results of observation also increased the results of tests of students' understanding of the material derived from functions.

The STAD type of cooperative learning methods is quite effectively applied in increasing student activity and students' understanding of class XI IPS I of SMA Negeri 4 Yogyakarta. This can be seen from the observations (observations) as well as the results of students' understanding tests given through tests at each meeting obtained by students. Students are very enthusiastic about participating in group learning and discussing with each other. Students also do not feel bored when learning mathematics takes place and are active in groups and respect each other's opinions in each group and between groups. Learning by using the STAD type cooperative learning model leads to the student center, not the teacher center. Thus this learning model can increase the activity and mastery of mathematical concepts of functional derivative material because students can exchange opinions and discuss with their friends during group work when learning takes place.

Research that is relevant to research conducted by researchers is research conducted by Juniati entitled Increased Activity, Motivation, and Learning Outcomes of Students with Sets Method in Class IXE SMP Negeri 3 Purworejo, Central Java on the Concept of Energy and Electric Power with increased activity by 40%. Research conducted by Erma and Sukirno entitled "The Implementation of Cooperative Learning Model Type Student Teams Achievement Division (STAD) Assisted Monopolistic Media in Increasing Accounting Learning Activities of Class X Accounting 2 Students of State Vocational High School 1 Godean Academic Year 2011/2012" with an increase in student learning activities by 20.63%. At the same time, researchers researched increased learning activities through the STAD type cooperative learning model of 25.85%. The possibility of a difference from the percentage increase in activities that have been carried out by researchers is the subject of research, research time, and also the material being taught.

CONCLUSION

Based on the results of research and discussion, it can be concluded that there is an increase in student learning activities and outcomes on the subject matter of the derivative function with the STAD type cooperative learning model.

1. This is shown from the observation sheets of student learning activities that have increased every cycle, namely, cycle I, the percentage of student learning activities by 56.51% in the sufficient category. In cycle II the percentage of student learning activities increased by 82.36% in the excellent category. This shows that there was an increase from cycle I to cycle II.

2. Student mathematics learning outcomes in the first cycle showed an average student learning outcome of 74.44 and, in the second cycle, increased with an average student learning outcome of 82.59. The MCC value of 75 shows that in the first cycle, 15 students completed with a classical percentage of 55.55% in the sufficient category and the second cycle there was an increase in which there were 23 students who completed with a percentage of classical completeness of 85.18% in the excellent category. This shows that an increase in learning outcomes from cycle I to cycle II.

REFERENCES

Arikunto, Suharsimi, dkk. 2007. Penelitian Tindakan Kleas. Jakarta: Bumi Aksara.

Dian Nur Megawati, Yolanda. 2012. Model Pembelajaran Kooperatif Tipe Team

Juniati. (2009). Peningkatan Aktivitas,Motivasi dan Hasil Belajar Peserta Didik dengan Metode Sets Di Kelas IXE SMP Negeri 3 Purworejo, Jawa Tengah Pada Konsep Energi dan Daya Listrik. Berkala Fisika indonesia. 2(1): 16-20.

Majid, A. (2015). Strategi Pembelajaran. Bandung: PT Remaja Rosdakarya.

Nurwati, T. (2011). Peningkatan Aktivitas dan Hasil Belajar Mata Diklat Produktif Pemasaran Dengan Menggunakan Metode Inkuiri Pada Siswa Kelas XI Pemasaran SMK Negeri 02 Purworejo Semester genap Tahun 2010/2011. Jurnal Ekonomi dan Pendidikan. 8(2):193-205.

Purwanto. (2013). Evaluasi hasil Belajar. Yogyakarta: Pustaka Pelajar.

Slavin, R. E. (2016). Cooperative Learning. Bandung: Nusa Media.