EFFORTS TO IMPROVE MATHEMATICAL LEARNING ACTIVITIES USING THE COOPERATIVE LEARNING MODEL OF TEAM ASSISTED INDIVIDUALIZATION (TAI) CLASS XI RPL SMK MUHAMMADIYAH KRETEK

Aang Kurniawan[a], Sumargiyani[b]
Program Studi Pendidikan Matematika Universitas Ahmad Dahlan
Jalan Ring Road Selatan, Tamanan, Banguntapan, Bantul Yogyakarta
[a]aangkurniawan7@gmail.com ,[b] sumargiyani04@yahoo.com

ABSTRACT

This class action research aims to improve the learning activities of students of class XI RPL at SMK Muhammadiyah Kretek through Team Assisted Individualization (TAI) cooperative learning models. The research subjects were students in class XI RPL. Research instruments in the form of test questions, observation sheets, and interviews. Data analysis techniques using qualitative descriptive analysis. The results showed that the application of the TAI type of cooperative learning model could increase student mathematics learning activities. Cycle I obtained the percentage of enthusiastic aspects of students in taking lessons 50.781% with sufficient criteria. Aspects of student interaction with teachers 49.98% with sufficient criteria. Aspects of interaction between students 50.78% in the criteria sufficient. The aspect of group collaboration 52.343% in the criteria is sufficient. Aspects of student activity in groups of 49.98% insufficient criteria. The aspect of student participation in concluding the results of discussion 56.25% in the criteria is sufficient. So the learning activities of students in class XI RPL are 51.71% with sufficient criteria. Cycle II obtained the percentage of enthusiastic aspects of students in taking lessons 66,406% with good criteria. 64.063% aspects of student interaction with teachers with good criteria. Aspects of interaction between students 61,709% in good criteria. The aspect of group cooperation is 64,063% in good criteria. Aspects of student activity in groups 62.5% in good criteria. The aspect of student participation in concluding the results of the discussion was 65,625% in good criteria. So the learning activities of students in class XI RPL are 64,063% with good criteria.
Keywords: Learning Activities, TAI, mathematics

INTRODUCTION

Learning activities are very important aspects of the learning process in schools, teachers play an important role in improving the quality of education is expected to be able to develop and choose the right model for the achievement of learning objectives. The learning atmosphere of students is very dependent on the conditions of learning and the ability of students to follow the learning process.

According to Mulyasa, (2004: 48) The quality of learning in a school can be seen in terms of the process and terms of learning outcomes at the school. The success of learning can be influenced by the learning approach used by the teacher. If the learning approach is interesting and student-centered, student motivation and attention will be raised so that there will be an increase in student interaction with students and students and teachers so that the quality of learning can improve.

Mathematical learning outcomes obtained are usually lower than learning outcomes for other subjects. Less optimal learning outcomes in mathematics are thought to be caused by several things including the lack of student learning activities in the learning process such as student enthusiasm in learning, student interaction, group activities and student participation in participating in discussions is still lacking. It is also thought to be caused by the learning model used by the teacher which is still less than optimal for increasing student activity and learning outcomes. Therefore in this study, the authors chose an alternative using the type of TAI cooperative learning model to increase student learning activities in mathematics learning that is in line with the findings of Ermi andayani (2012) which states that the TAI type of cooperative learning model can increase learning activities by 11.89%.

According to Isjoni (2013: 16), the cooperative learning model is a learning model that is currently widely used to summarize student-centered teaching and learning activities (student-oriented), especially to overcome problems found by teachers in activating students, who cannot work together with other people, students who are aggressive and don't care about others

According to Robert E. Slavin (2010: 15-16), TAI is a learning model that combines cooperative learning and individual learning. TAI has the motivational dynamics of STAD and TGT, students support each other and help each other to try hard because they all want their team to succeed, individual responsibility is ensured because the only score that counts is the final score. But a little different, the hallmark of TAI type of cooperative learning is the existence of a placement test before the formation of groups. According to Robert E. Slavin (2010: 195-200), the Team Assisted Individualization (TAI) cooperative learning model used consists of 8 important elements, namely: (1) Placement test, namely to determine initial abilities, students are given a test in the form of a pretest or can be a previous test result. (2) Teams or groups: Students learn in small groups of 4-5 heterogeneous people. (3) Curriculum materials, researchers explain the outline of the material to be studied by students. (4) Group learning, students are given an individual learning unit, the unit contains material then students work on and discuss these units in their respective groups. If there are students who have difficulty being advised to ask for help in groups before asking for help from the teacher. (5) Team Scores and Team Recognition, namely giving a score of the group's work and giving criteria of appreciation to the group that succeeded in completing the task. (6) Unit of the whole class, ie at this stage a class discussion is held, each group member presents the results of his group's work. (7) Fact test, namely the teacher gives a test to measure students' abilities after being given the material. In this study, the test was given after the end of each cycle. (8) Whole-Class Units, namely the provision of material by the teacher back at the end of learning time with problem-solving strategies.

Good or bad learning outcomes obtained by students one of which is influenced by learning activities, where if the learning activities are good then the results obtained will be good too. According to Kunandar (2008: 277), student activity is the involvement of students in the form of attitudes, thoughts, attention, and activities in learning activities to support the success of the teaching and learning process and benefit from these activities.

According to the Directorate of Coaching (2010: 57-58) about the technical guidelines for the development of effective assessment tools, student activities in mathematics learning can be seen from (1) students' enthusiasm in participating in learning, (2) student interactions with teachers, (3) interactions between students, (4) group collaboration,, (5) student activities in groups and (6) student participation in summarizing the results of the discussion.

The purpose of this study is to improve mathematics learning activities by using the cooperative learning model of the TAI type of class XI RPL students at SMK Muhammadiyah Kretek Bantul Regency in the odd semester of the 2016/2017 school year.

METHODS

This research is Classroom Action Research (CAR). The subjects of this study were 16th-grade students of RPL in SMK Muhammadiyah Kretek Bantul Regency with a total of 16 students. This research was conducted at the Muhammadiyah Vocational School Kretek in Bantul Regency in the odd semester of the 2016/2017 school year.

The research procedure used in PTK consists of two cycles. Learning at the Cycle I and Cycle II stages using the TAI type of cooperative learning model then the researcher acts as a teacher. According to Suharsimi Arikunto, et al (2007: 16-20), the activities carried out in each cycle are as follows (1) planning, (2) implementation of actions, (3) observation and (4) reflection. At this planning stage, the researcher compiles and prepares the following items (1) lesson plans (RPP) (2) student activity observation sheets (3) student interview sheets and (4) description questions for each cycle. At the implementation stage of the action, the activity carried out by the researcher is to implement the lesson plans that have been made, namely to do learning with the TAI learning model. The material

discussed is about sine rules and cosine rules with the following details (1) in Cycle I discussing sine rules (2) in cycle II discussing cosine rules. At this observation stage, the researcher was assisted by two UAD students acting as observers who observed all student learning activities while learning activities took place. In the reflection stage, the researcher and observer conduct a discussion to evaluate the teaching and learning process that has been going on and prepare an action plan in the next cycle.

Data collection techniques used in this study are as follows (1) interviews were conducted on several students at the end of each cycle meeting, (2) observations were made to find out student learning activities during the learning process, (3) triangulation was defined as data collection techniques that are combining various data collection techniques and existing data sources. Triangulation is used to find out the data obtained so that it is clearer, consistent, complete and certain and (4) The test is used to determine the level of student success in participating in learning.

Analysis of the data used is descriptive qualitative. The activity observation sheet is analyzed using the formula:

$$P = \frac{st}{sm} \times 100\%$$

P   : percentage

st   : total score from observations

sm   : total score

The criteria for the P-value can be seen in the following table:

Table 1. P-Value Criteria

Percentage	Criteria
$80\% \leq P \leq 100\%$	Very high
$60\% \leq P < 80\%$	High
$40\% \leq P < 60\%$	Medium
$20\% \leq P < 40\%$	Low
$0\% \leq P < 20\%$	Very low

(Riduwan, 2012:15)

The indicator of the success of this study is the learning activities of students in learning mathematics increase, ie if student activity reaches a minimum of good criteria that is ≥60%.

RESULTS AND DISCUSSION

Cycle I was held on August 22 and 25, 2016. In Cycle I students discussed the sine rules, students were given Student Work Sheets (LKS) students were given the opportunity to deepen the material if students have difficulty being allowed to ask a groupmate or the teacher. Students are asked to do the practice questions in the worksheets individually after the practice questions are completed students discuss the results of their work with a groupmate. Students present the results of the answers that have been discussed in the group to the front of the class, students who advance presentations are students chosen at random by the researcher. Random selection aims to find out whether all students understand and understand about what is learned at this meeting. From the observations of Cycle 1, the percentage of enthusiastic aspects of students participating in the lessons was 50.781% with sufficient criteria. Aspects of student interaction with teachers 49.98% with sufficient criteria. Aspects of interaction between students 50.78% in the criteria sufficient. The aspect of group collaboration 52.343% in the criteria is sufficient. Aspects of student activity in groups of 49.98% insufficient criteria. The aspect of student participation in concluding the results of discussion 56.25% in the criteria is sufficient. So the learning activities of students in class XI RPL are 51.71% with sufficient criteria.
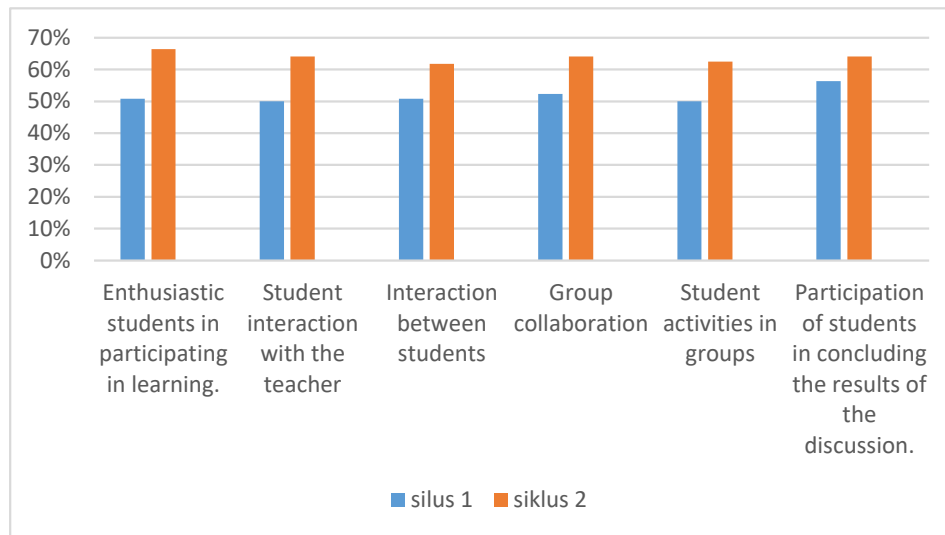
Reflection Cycle I: (1) Students secretly play their gadgets. Students are not spontaneous if given the task because they do not understand the material. Students are affected by the situation outside the classroom because when the research takes place there is a photoshoot held by the winner of the gravity competition which was previously held (2) Students do not ask and answer questions for fear of being wrong and are still shy about expressing their opinions. (3) Students are already good at utilizing

their own groups but students only ask other groups if no one in their group understands. (4) Students have difficulty doing their work so that they have difficulty helping friends in their groups.
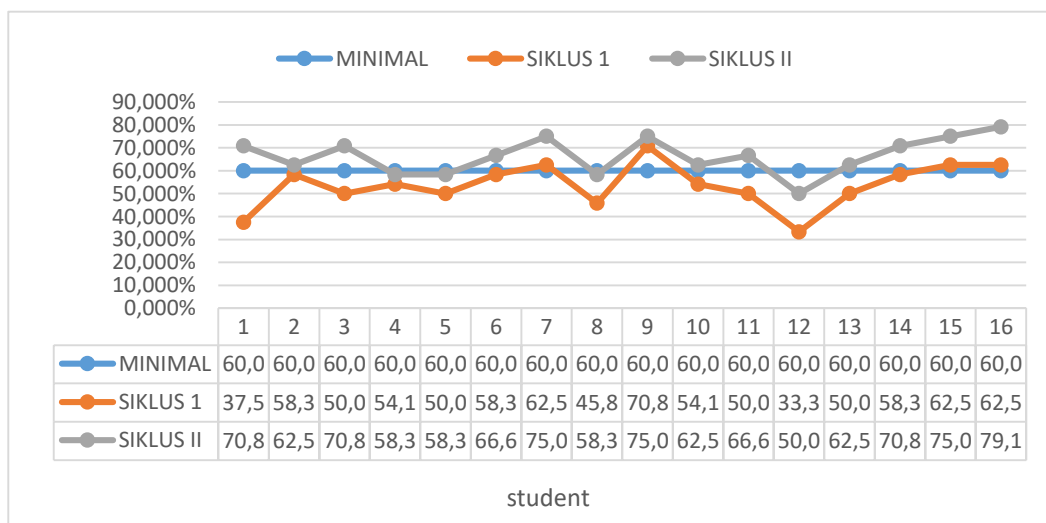
Cycle II was held on August 29, 2016, and September 2, 2016. In this cycle, students discussed cosine rules still using the same learning model as Cycle I. Based on observations obtained in Silkus II the percentage of enthusiastic aspects of students participating in lessons 66.406% with criteria well. 64.063% aspects of student interaction with teachers with good criteria. Aspects of interaction between students 61,709% in good criteria. The aspect of group collaboration is 64,063% in good criteria. Aspects of student activity in groups 62.5% in good criteria. The aspect of student participation in concluding the results of the discussion was 65,625% in good criteria. So the learning activities of students in class XI RPL are 64,063% with good criteria.

Reflection on Cycle II: Student learning outcomes using the TAI type of cooperative learning model have increased from cycle I to cycle II. From the average cycle I which was 51.707% and cycle II which became 64.063%. Based on observations made in 4 meetings the goal has been achieved that is an increase in student learning activities. This is also in line with research conducted by Mustafa et al (2011) that student learning activities can be improved by using TAI type cooperative learning models.

The results of Cycle I and Cycle II research, in general, are presented in the following graph:

Picture 1. Improvement of Student Learning Activities for Each Indicator

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MINIMAL	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0
SIKLUS 1	37,5	58,3	50,0	54,1	50,0	58,3	62,5	45,8	70,8	54,1	50,0	33,3	50,0	58,3	62,5	62,5
SIKLUS II	70,8	62,5	70,8	58,3	58,3	66,6	75,0	58,3	75,0	62,5	66,6	50,0	62,5	70,8	75,0	79,1

student

Picture 2. Increased Learning Activities for Each Student**.**

From graph 2 it can be seen that in Cycle I student learning activities are still not maximized, this is evidenced by only 4 students achieving a percentage of ≥ 60%. While in Cycle II there was an increase in student learning activities, it can be seen from students who achieved a percentage of ≥ 60% there were as many as 12 students showing an increase in learning activities in Cycle II.

The results of the study have fulfilled the research indicators, so it can be concluded that the TAI type of cooperative learning model can increase the learning activities of students in class XI RPL of SMK Muhammadiyah Kretek in odd semester of 2016/2017 academic year with the material sine rules and cosine rules.

CONCLUSION

The application of the TAI type of cooperative learning model can increase the learning activities of students in class XI RPL at SMK Muhammadiyah Kretek odd semester 2016/2017 academic year. Student learning activities can be improved by the type of TAI cooperative learning model carried out according to the stages.The TAI type cooperative learning model accompanied by student worksheets should be used as an alternative to increasing student learning activities so as to increase learning variation.

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