Application of The student Teams Achivement Division (STAD) Type Cooperative Method on Algebraic Function Limit Material to Improve Learning Outcomes and Student Motivation

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Abstract: Mathematics is a universal science that will continue to develop along with the times, a science that is obtained carefully, clearly, and accurately. Learning and understanding math is difficult, complicated and scary because it requires students to think logically, carefully, diligently, systematically, and must have learning motivation. Learning motivation is a description that is often used to explain the success of students' learning tasks, the time and effort they devote to them, so that the desired learning goals are achieved. The higher the child's motivation, the higher the learning outcomes obtained by students. To increase students' motivation and learning outcomes in this study using the Student Teams Achievement Division (STAD) cooperative type. The purpose of this study was to determine the learning motivation and mathematics learning outcomes of students in classes that used Student Teams Achievement Division (STAD) cooperative type. The population in this study was the learning motivation and mathematics learning outcomes of grade XI students of MA Negri 1 Indramayu. The sample was selected randomly. The instruments used were a test of description questions and observation sheets of student motivation. The results of data processing obtained the average in cycle 1 for learning outcomes is 78.75 and the average motivation in cycle 1 is 2.86 with a sufficient category of 19 students and a less category of 7 students. The results of data processing in cycle 2 obtained an average for learning outcomes of 80.00 and an average motivation in cycle 2 of 3.36 with a sufficient category of 23 students and a good category of 3 students. And the results of data processing in cycle 3 obtained an average for learning outcomes of 86.92 and an average motivation in cycle 3 of 3.86 with a good category of 25

students and a very good category of 1 student. So it can be concluded that cooperative learning type Student Teams Achievement Division (STAD) can increase students' motivation and math learning outcomes. For further research, other methods can be developed to improve student learning outcomes.

Keywords: Learning outcomes, learning motivation, STAD

Introduction

Mathematics is a universal science that underlies technological developments, has an important role in advancing human thinking. Learning mathematics is one of the important means to develop students' academic abilities. The development of academic ability is one of the things to be realized through the educational process and mathematics is one of the subjects that needs to be developed (Sani & Burghes, 2022). In mathematics subjects, deductive thinking skills are needed, namely the ability to draw logical conclusions by switching from general premises to specific conclusions (Kohen et al., 2023). Mathematics is a science obtained by reasoning that uses titles that are carefully defined, clear, and accurate, represented by symbols or symbols and have meaning and can be used in solving problems related to numbers. From the two opinions above, it can be concluded that mathematics is a universal science that will continue to develop with the times, science obtained carefully, clearly, and accurately.

Learning and understanding mathematics is very difficult, complicated and scary because it requires students to think logically, thoroughly, diligently, systematically, and have a real effort in learning it (Hutauruk & Priatna, 2017). This makes students feel bored, and has no motivation in improving learning outcomes, thus affecting the cognitive and psychomotor aspects of students in the mathematics learning process (Lalian, 2018; Widada et al., 2018) explained that with the current mathematics learning is more focused on students and emphasizes students to understand concepts, facts and principles.

Motivation is a complex part of psychology and human behavior that influences the way individuals to allocate their time, the energy they expend, how they think and feel about the task at hand, and how long they stay at it (Bakar, 2014). Motivation is important in getting students to engage in academic activities(Filgona et al., 2020). Learning motivation is a picture in students' choice of learning tasks, the time and effort they devote to them, their perseverance in learning tasks, and in overcoming obstacles they encounter in the learning process (Filgona et al., 2020). Learning motivation is all efforts within oneself that cause learning activities and ensure the continuity of learning activities and give direction to learning

activities so that the desired goals are achieved (Laka et al., 2020). From some of these opinions it can be concluded that learning motivation is a picture that is often used to explain the success of student learning tasks, the time and effort they devote to them, so that the desired learning goals are achieved.

The higher the motivation, the higher the learning outcomes obtained by students, one of which is understanding the learning material (Gaol & Sitepu, 2020). According to Anuar Salwa, (2021) Motivation is a major factor that plays an important role in influencing student performance and learning activity in the classroom. With the delivery of material in the classroom, obstacles arise faced by teachers, namely when the learning model is less interesting and makes students feel bored (puspitarini et al., 2019). To deal with obstacles in the classroom, it is necessary to apply a method in learning, especially mathematics learning, it is necessary to formulate the right learning strategy that will facilitate the process of forming knowledge in students so that learning objectives can be achieved well. In this study using the type of Cooperative method student teams achievement division, Nur Syamsu et al., (2019) argues that cooperative type student teams achievement division is the best model to encourage students to encourage each other to motivate each other and help each other to master the skills taught by the teacher.

Cooperative learning is a learning that forms groups and then conducts learning activities together in each group to achieve a goal, with cooperative learning students are expected to help each other, give each other arguments, and discuss to solve a problem(Prananda, 2019). Student Teams Achievement Division (STAD) is a cooperative learning strategy in which several small groups of students with different levels of academic ability work together to complete learning objectives. Not only academically, students are also grouped variously by gender, race, and ethnicity. So cooperative learning type Student Teams Achievement Division (STAD) is a learning that is formed into small groups with different levels of ability and work together to complete learning objectives.

Type cooperative model Student Teams Achievement Division (STAD) has five stages: 1) class presentation is the stage where the teacher explains or presents the material to be learned 2) the learning team conducts learning in groups by students 3) quizzes are conducted to find out students' understanding of the material they have learned 4) individual progress scores are obtained from increasing students' individual scores and 5) team recognition is obtained from students' individual score scores against their teams(Nasution & Hafizah, 2020). The STAD model emphasizes activities and interactions between students to help each other in mastering the subject matter, in order to achieve the expected goals.

The objectives of this activity are:

1) To find out the Cooperative learning model type Student Teams Achievement Division (STAD) is effective for developing student mathematics learning outcomes on the Limit Algebra Function material.

2) To find out the Cooperative learning model type Student Teams Achievement Division (STAD) is effective for developing student learning motivation on the Limit Algebra Function material.

3) To find out learning motivation can affect student learning outcomes on the Limit Algebraic Function material.

Research Method

This collaborative classroom action research collaboration between the school, especially teachers and researchers, is needed. Because teachers and researchers jointly study problems and think about the problems studied in order to find solutions to problems in classroom action research conducted. Implementers in classroom action research are carried out by the researchers themselves, while the teacher serves as an observer during the learning process. Researchers act as planners, implementers, data collectors, data analyzers and in the end researchers become reporters of research results. Thus, this research was carried out to provide direct improvements to the problems that occurred in MA Negeri 1 Indramayu and in addition to finding new solutions to the problems faced. Through this method, it is expected that there can be an increase in activeness and derivative learning outcomes of functions by applying the type of cooperative learning model Student Teams Achivement Division (STAD)

The implementation of research that will be carried out uses several cycles in stages. The stages in each cycle will be evaluated and analyzed to determine the extent of the impact of the change from the given method in order to be a comparison for the next cycle. The stages passed in this class action research are planning, implementation, observation and reflection. The cycle will be carried out continuously until researchers find changes and solutions that can change learning for the better so that the problems experienced by students can be corrected and resolved optimally. In addition, researchers will also obtain alternative solutions to determine the class action plan that will be implemented in the next action. Action Research This class has four stages consisting of planning, implementation, observation, and reflection.

Result and Discussion

The results of this classroom action research were obtained from data on the results of the description test given to students in each cycle and observation sheets of student motivation

observed during the cycle. The purpose of giving a description test in each cycle is to determine the improvement of student mathematics learning outcomes while the motivation observation sheet aims to determine the increase in student motivation. The results of the description and observation tests are also used as reflection material to improve and improve classroom learning. The following is the description and learning outcomes.

The mathematics learning outcomes referred to in this study are the Application of the Type Cooperative Method Student Teams Achievement Division (STAD) On the Limit Material of Algebraic Functions. From the test result data conducted at the end of each cycle, an analysis is carried out that aims to obtain an overview of the achievement of learning completeness. The level of learning completeness is presented in the table 1.

Table 1 Student Completeness in Learning

Explanation	Student test scores on each test		
	I	II	III
Average Math Learning Outcomes Score	77.5	80.77	86.9
Percentage of students who completed	65.38	76.92	84.6

The completeness of learning presented in the table shows that the average student score in cycle 1 was 77.5, from the table it can be seen that students who completed their learning in the first action were 17 out of 26 students who took the test in cycle I. So the percentage of students who complete learning is 65.38%. In this case, the completeness criterion can be concluded that the follow-up on cycle 1 is high.

In cycle II, the average student ice score was 80.77 and the number of students completed in learning in cycle II was 20 out of 26 students who took the test in cycle II. So that the completeness of learning is 76.92%. In this case, the criteria according to the curriculum can be concluded that the Actions in cycle II are classified as high. In cycle III, the average student ice score was 86.9 and the number of students completed in learning in cycle II was 22 out of 26 students who took the test in cycle III. So that the completeness of learning is 84.6%. In this case, the criteria according to the curriculum can be concluded that the Action in cycle III is classified as high.

The results of student observations in cycle I that have been given Actions on motivational instruments in generally have reached the sufficient category (C), namely an average of 2.86 out of 26 students who participated in learning in cycle I, which was stated to lack learning motivation as many as 7 students and who had enough learning motivation as many as 19

students or 73.08%, because the target of learning motivation is 75%, then in cycle I has not reached the category of having learning motivation.

The results of student observations in cycle II that have been given Actions on motivational instruments in umunmya have reached the sufficient category (C), namely an average of 3.36 out of 26 students who participated in learning in cycle II, who were declared to have good learning motivation as many as 3 students and who had sufficient learning motivation as many as 23 students or 88.5%, because the target of learning motivation is 75%, then in cycle II it has reached the category of having learning motivation.

The results of student observations in cycle III that have been given Actions on motivational instruments in umunmya have reached the sufficient category (C), which is an average of 3.86 out of 26 students who participated in learning in cycle III, which was stated to have excellent learning motivation as much as 1 student and those who have good learning motivation as many as 25 students or 96.1%, because the target of learning motivation is 75%, then in cycle III it has reached the category of having good learning motivation.

Conclusions

Based on the results of observations and the results of data processing during the study which includes data analysis to determine the improvement of mathematics learning outcomes and student learning motivation, the following conclusions were obtained. (1) The use of the Student Teams Achievement Division (STAD) type Cooperative learning model can improve student mathematics learning outcomes through tests at the end of each cycle. (2) The use of the Student Teams Achievement Division (STAD) type cooperative learning model can increase student motivation through observation in each cycle.

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