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Efforts to Improve the Active Role of Students in Mathematics Learning through Student Team Achievement Division (STAD) Learning Model at Elementary School

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Abstract

The success of learning can be seen from the learning process that takes place in the classroom. Problems in the field show that the students' active role in the learning process is still low. This study aims to determine the increase in the active role of students in learning mathematics. The student's active role in mathematics learning needs to be enhanced by appropriate learning models. It aims to explore students' self-ability, improve the quality of learning, play an active role in learning and responsible in completing the task. This research is a classroom action research with the setting of grade 4 students of elementary school. The learning model used is the Student Team Achievement Division (STAD) learning model. The study was conducted in 3 cycles. Cycle I consists of 2 meetings, cycle II consists of 2 meetings and cycle III consists of 2 meetings. Data were obtained by using observation sheets of student activities, interviews with teachers and students, documentation and field notes. Data analysis used is qualitative descriptive analysis. The results showed that learning using Student Team Achievement Division (STAD) learning model can improve the active role of students in learning mathematics. Enthusiastic students in following learning in the cycle I 78.12%, cycle II 91.79%, cycle III 98.82%. Student interaction with teacher in cycle I 31,64%, cycle II 62,5%, cycle III 87,49%. Interaction between students in cycle I 10,15%, cycle II 47,26%, cycle III 75,39%. Group cooperation in cycle I 0, cycle II 58,98%, cycle III 86,72%. Student activity in the group in cycle I 19,53%, cycle II 68,75%, cycle III 92,96%. Student participation concludes the result of discussion in cycle I 22,65%, cycle II 46,09%, cycle III 69,92%. The average increase in the active role of students, in cycle I 27.02 %%, cycle II 62.56%, and cycle III 85.22%. Through interviews of teachers and students obtained diagnostic test results increased from the cycle I 29.17%, cycle II 66.67%, and cycle III 87.5%.

Keywords: Student Team Achievement Division (STAD), active role, learning mathematics

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1. Introduction

Mathematics learning aims to form a critical and creative thinking pattern, students are brought to observe, guess, do, try or answer questions why and discuss. This principle of active learning is expected to foster creative and critical math learning

goals [1]. Mathematics as a basic science today has grown rapidly, both material and its usefulness, so that in its development or learning in schools need to pay attention to its development both in the past, present and possibly for the future. This shows that what is meant by mathematics in the Curriculum of Elementary and Secondary Education is the school mathematics. School mathematics is the math that is taught in schools. The functions of mathematics subjects are as a tool, mindset, and science [1]. Mathematics courses need to be given to all students to equip students with logical, analytical, systematic, critical, and creative thinking skills, as well as the ability to work together. Such competence is needed so that the student can have the ability to acquire, manage, and utilize information to survive in an ever-changing, uncertain, and competitive state. Mathematics in elementary school is expected to be a vehicle for teachers to educate and provide basic skills to students to develop themselves according to their talents, interests, abilities, and environment. The ability and skills of teachers in selecting and using various models, methods and learning strategies are constantly being improved so that students are more enthusiastic in following the subjects of mathematics.

Learning is an active process of students to shape their knowledge. Activity learning occurs in all learning activities, learning activities are manifested in various forms, such as: listening, discussing, making something, solve problems, give opinions, and so on. Students must be active in learning according to their role as subject of learning. Students are not only active in accepting all that is given by teachers but must be active in constructing their knowledge and play an active role in learning. Active is in the learning process occurs the atmosphere so that students actively ask, question, and express opinions [2]. Active learning is learning that provides opportunities for self-study or self-activity. With active learning and active role of students as optimal as possible, then can change his behavior more effectively and efficiently. Activities in active learning include: observation, interaction, communication, and reflection [2]. Student learning activities can be seen from various things. The types of student learning activities include: a) Students study individually to apply concepts, principles and generalizations; b) Students learn in group form to solve problems; c) Each student participates in carrying out their learning tasks through various means; d) Students dare to express their opinions; e) There are learning activities of analysis, synthesis, research and conclusions; f) Maintaining social relationships in conducting learning activities among students; g) Each student may respond to the opinions of other students; h) Each student has the opportunity to use the remaining resources of learning; i) Each student tries to assess the learning outcomes achieved; and j) There is an effort from the students to ask the lecturer and accept the lecturers' opinions in their learning activities [3].

Learning activities include: a) Enthusiastic students in following learning; b) Interaction of students with lecturers; c) Interaction between students; d) Group cooperation; e) student activities in groups; and f) Student participation in summarizing the results of the discussion [4]. Math lessons related to everyday life is not only theory but more group activities to establish good communication so that it can exchange information about the material given between one friend to another. With the right learning model the learning outcomes will be better.

Cooperative learning is a small group of learners / students working together in a team to solve a problem, complete a task, or achieve a common goal. One of the benefits of using collaborative learning is improving learning achievement and improving social skills, and the second benefit is that as more students work together in collaborative groups, the more they understand, retain, and feel better about themselves and their peers, let alone work together in environmental collaboration encourages student responsibility for learning [5].

Cooperative learning is a learning model with a system of learning and working in small groups of 4-6 people in a collaborative way that can stimulate students more passionate in learning [6]. The main objective in applying cooperative learning model is that learners can learn in groups with their friends by mutual respect of opinion and give opportunity to others to express their ideas by expressing their opinions in groups [7]. The characteristics of cooperative learning include: a) each member has a role; b) there is a direct interaction relationship between students; c) each member of the group is responsible for his or her study as well as his or her group mates; d) teachers help develop group interpersonal skills; e) teachers only interact with groups when needed. One of the learning models that support to improve student activeness so that motivated motivation to improve learning achievement is model of cooperative learning type Student Team Achievement Division (STAD). STAD type cooperative learning is one of the simplest types of cooperative learning, so this type can be used by lecturers who are just beginning to use cooperative learning approaches. From a variety of studies comparing cooperative learning including STAD with conventional methods over a period of at least 4 weeks, the results consistently demonstrate the benefits of cooperative learning, as long as two important conditions are met: (1) various forms of recognition or small rewards should be given to groups with good performance, and (2) there must be individual responsibility, meaning that the success of the group must be determined by the individual learning outcomes of all members of the group [8]. STAD learning model students learn in small groups with different ability backgrounds, interaction occurs between group members and all group members must be involved

because the success of the group is supported by the activities of group members, so that each member of the group must help each other and collectively, the same trying to solve the problems faced. By using STAD learning model, it is hoped that students will more easily understand the concept of appreciating if they can discuss each other's problems with their friends, so as to achieve optimal learning outcomes. By learning small groups, students are more free to ask about things that have not been understood to their friends without fear, shame, or low self so that students' understanding of a lesson will increase.

Based on interviews with fourth grade teachers in some elementary schools in Kecamatan Kokap the students' active role in the mathematics learning achieved by students is still low. The activity of increasing the active role of students in learning mathematics has been done, but the results have not been satisfactory. This is because the involvement of students to play an active role in learning mathematics is not maximal, not all students are eager to participate actively in learning mathematics. Students are less enthusiastic in following lessons, lack of interaction with teachers, for example students do not dare to ask and express opinions, lack of cooperation among students, students do not do the tasks in groups, and lack of courage students in concluding the results of the discussion.

Factors of teachers can be seen from the way teachers teach, the completeness of learning tools, and mastery of various methods and learning models. This can be seen from the lack of methods and learning media used during the learning process. During this time the teacher uses more lecture methods that make students quickly bored. When the teacher explains, many students do not pay attention. Mastery of classes by teachers is still lacking, as evidenced by teachers have not been able to cope with the class so that the class is not conducive.

Some of the factors of students is the attitude of students who are lazy and saturated with mathematics subject matter that the material is quite a lot and less interesting. This is indicated by the fact that most of the students are busy when the lectures take place, even they are engrossed in talking with friends, and the attention is not centered on the ongoing lectures in the classroom.

One important element for students to be active and participate in learning is the learning model used by teachers in teaching. Math lessons related to everyday life is not only merely the theory but more group activities in order to establish good communication so that it can exchange information about the material given between one friend to another. With the right learning model the learning outcomes will be better.

One of the learning models that support to improve student activeness so that motivated motivation to improve learning achievement is model of cooperative learning type Student Team Achievement Division (STAD). In this STAD learning model students learn in small groups with different ability backgrounds, interaction occurs among group members and all group members must be involved because the success of the group is supported by the activity of group members, so that each group member should help each other and together -same to solve the problems faced. By using STAD learning model, it is hoped that students will more easily understand the concept of appreciating if they can discuss each other's problems with their friends, so as to achieve optimal learning outcomes. By learning small groups, students are more free to ask about things that have not been understood to their friends without fear, shame, or low self so that students' understanding of a lesson will increase.

Based on the above background, the effort to increase the student's active role is done by using STAD type cooperative learning model. With this kind of cooperative learning model students are given as many opportunities as possible to explore their ability and socialization so that they are not only passive and receive knowledge from the teacher but are able to find out, exchange ideas, and solve problems in discussion with their group so as to create a learning activity the communicative not only stay in place and memorize too much. The use of this model causes the active role of students will be encouraged to learn and want to know so that siswapun achievement is also more increased.

2. Literature Review

The first relevant research from Gen Antuasih in 2009 with the title: "Efforts to Improve the Active Role of Students in Mathematics Learning through Cooperative Learning Model Type STAD (Student Teams Achievement Division) Student Class VII Odd Semester SMP 2 Banguntapan Bantul Regency Year 2008/2009" [8]. The results of the study showed an increase in the active role of students in each cycle. The percentage of liveliness in the first cycle of 48.27% increased to 59.37% in cycle II and on the third cycle increased by 74.48%. The average value of quiz in cycle I reached 74.71% while cycle II reached 78.22% and the third cycle reached 81.56%. Judging from the questionnaire of student response there is a positive response from students to the implementation of mathematics learning. This is indicated by the high percentage of each indicator is the aspect of motivation of 82.46% with high quality, student interaction with lecturer

of 82.33% with high quality, cooperation with the group of 78.89% with high quality, aspect in doing the task and the problem of 78.75% with high quality.

The relevant second study of Nicke Yulanda in 2014 also reveals the Influence of Cooperative Learning Teachers Model Teams Achievement Division (Stad) Against Understanding Mathematical Concepts. Based on the results of the research can be drawn conclusions as follows: 1) Developments Understanding the concept of students tends to increase after applied model of cooperative learning type student team achievement division (STAD), especially on the concept of understanding indicators that is, use, utilize and choose a particular procedure or operation and apply the concept or problem solving algorithm. 2) Understanding the concept of mathematics students learning using cooperative learning model type student team achievement division (STAD) is better than understanding the concept of mathematics students learning using conventional learning.

It can be seen, however, that both studies discussed the use of STAD in mathematics learning. The results showed that STAD effectively applied to learning mathematics.

3. Material & Methodology

3.1. Data

Data were collected using observation, interview, documentation and field notes. Observations in this study observed the active role of students in learning, interviews conducted to support the results of observation, documentation in the form of photographs and catatn students, while field notes derived from what is seen, heard, experienced and thought in order to collect data and reflection on the data in research. Data analysis used is qualitative data analysis in the form of validity, reliability, and objectivity. Data analysis techniques performed through data reduction, display data, take conclusions and verification.

3.2. Method

This type of research is a Classroom Action Research (PTK) using a qualitative approach. Broadly speaking the steps of classroom action research are: planning, execution, observation, and reflection [9].

1. Planning (planning)

Explain what, why, when, where, by whom and how the action was done. In the planning stage the researcher determines the point or focus of the event that needs special attention to be observed, then creates an observational instrument to help the researcher record the facts that occurred during the action.

2. Implementation (acting)

   Implementation is the implementation or implementation of the contents of the design. The implementation seeks to comply with what has been formulated in the draft and to remain fair. Implementation of research is the researcher who acts as a lecturer.

3. Observation (observing)

   Implementation of observation is done by lecturer of class VII math at the time of action in progress. Observations are made of what happens when the action takes place while recording the activities that occur.

4. Reflection (reflecting)

   The reflection activity aims to re-examine what has happened, when the researcher has finished doing the action and then dealing with the seventh grade mathematics lecturer to jointly discuss the implementation of the action plan.

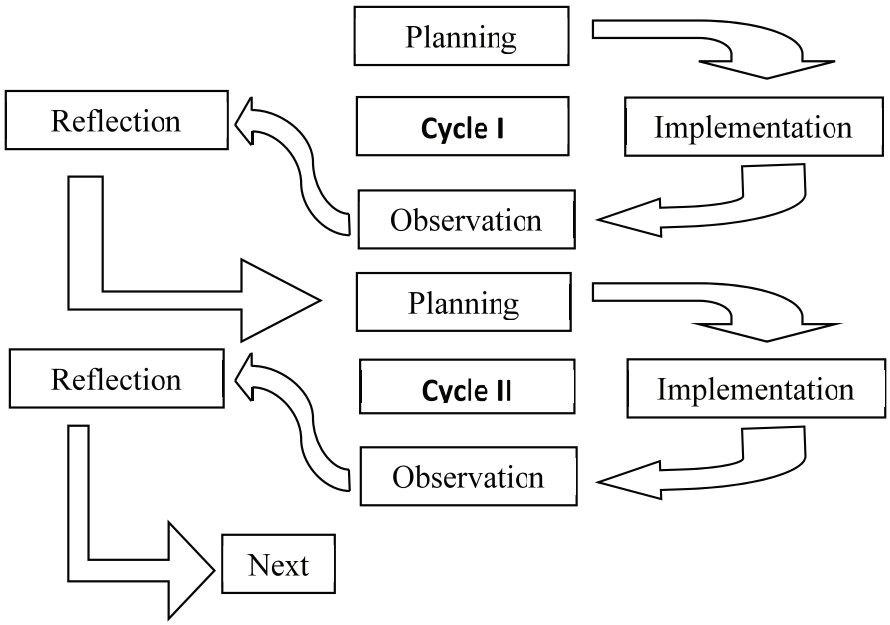

Figure 1: Research design.

4. Results and Discussion

4.1. Result

After the action done on the cycle I, II, III, researchers with teachers to observe the implementation of the action cycle I, II, III. The results obtained from the observation of teacher and student learning are as follows:

Table 1: Percentage of Increasing the Active Role of Students on Each Indicator.

No	Indicator	Cycle I	Cycle II	Cycle III	Description
		Percentage	Percentage	Percentage	
1	Enthusiastic students in following learning	78,12%	91,79%	98,82%	Increased
2	Interaction of student with lecturer	31,64%	62,5%	87,49%	Increased
3	Interactions among students	10,15%	47,26%	75,39%	Increased
4	Group Cooperation	0	58,98%	86,72%	Increased
5	Student activity in groups	19,53%	68,75%	92,96%	Increased
6	Participation students concluded the discussion results	22,65%	46,09%	69,92%	Increased
Average		27,02%	62,56%	85,22%	Increased

From the table, there was an increase in the students' active role in each indicator. Enthusiastic students in following learning in the cycle I 78.12%, cycle II 91.79%, cycle III 98.82%. Interaction of student with lecturer in cycle I 31,64%, cycle II 62,5%, cycle III 87,49%. Interaction between students in cycle I 10,15%, cycle II 47,26%, cycle III 75,39%. Group cooperation in cycle I 0, cycle II 58,98%, cycle III 86,72%. Student activity in the group in cycle I 19,53%, cycle II 68,75%, cycle III 92,96%. Student participation concludes the result of discussion in cycle I 22,65%, cycle II 46,09%, cycle III 69,92%. For more details presented the following figure.

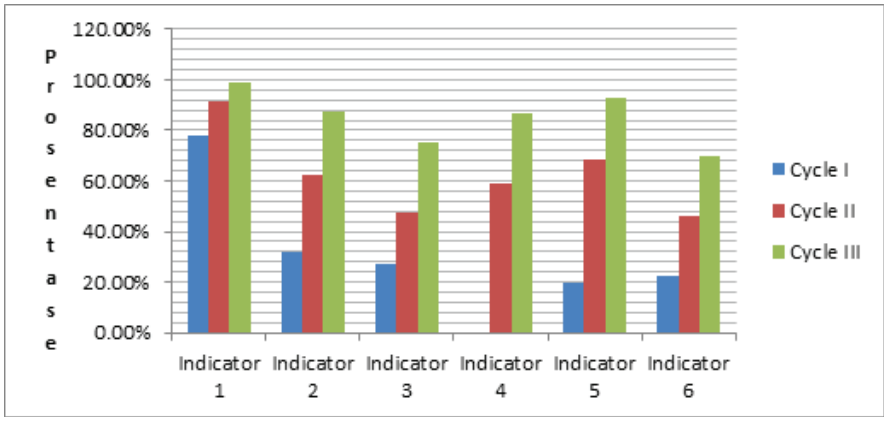

Figure 2: Enhancement of the Active Role of Any Student Indicator.

The average percentage of increasing the active role of students on learning mathematics from cycle I, cycle II, cycle III can be seen in the following table:

Table 2: Average Percentage of Active Student Enhancement.

Cycle	Percentage
Cycle I	27,02%
Cycle II	62,56%
Cycle III	85,22%

From the table, it can be seen that there is an increasing active role of students, in cycle I 27,02 %%, cycle II 62,56%, and cycle III 85,22%. For more details presented the following figure.

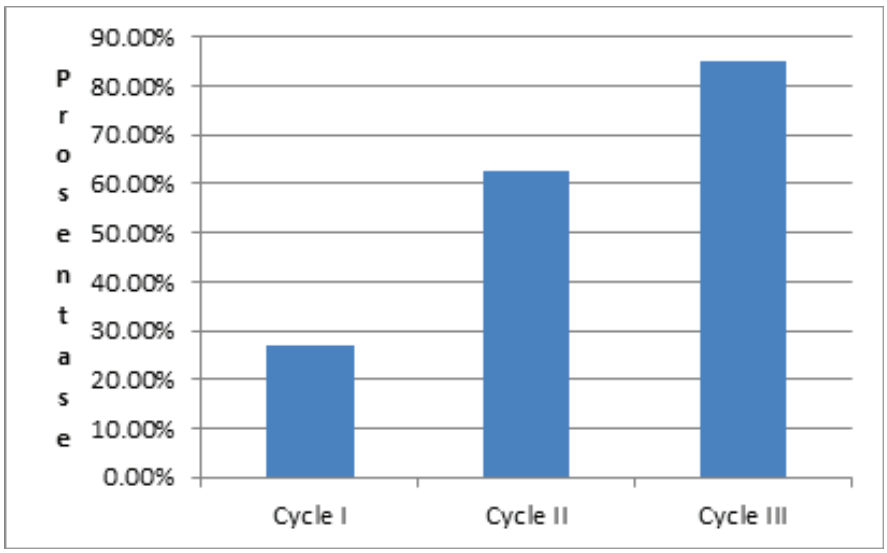

Figure 3: The Average Enhancement of Student's Active Role.

The results of diagnostic tests obtained from lecturer and student interviews increased from cycle I, cycle II, cycle II. The response of lecturers and students to learning mathematics using STAD model is very good. Based on the interview results obtained the following results.

Table 3: Percentage of Diagnostic Test Results.

Cycle	Number of indicators performed by the students	Percentage
I	7	29,17%
II	16	66,67%
III	21	87,5%

From the table above can be seen that the diagnostic test results increased from the cycle I 29.17%, cycle II 66.67%, cycle III 87.5%. For more details presented the following figure.

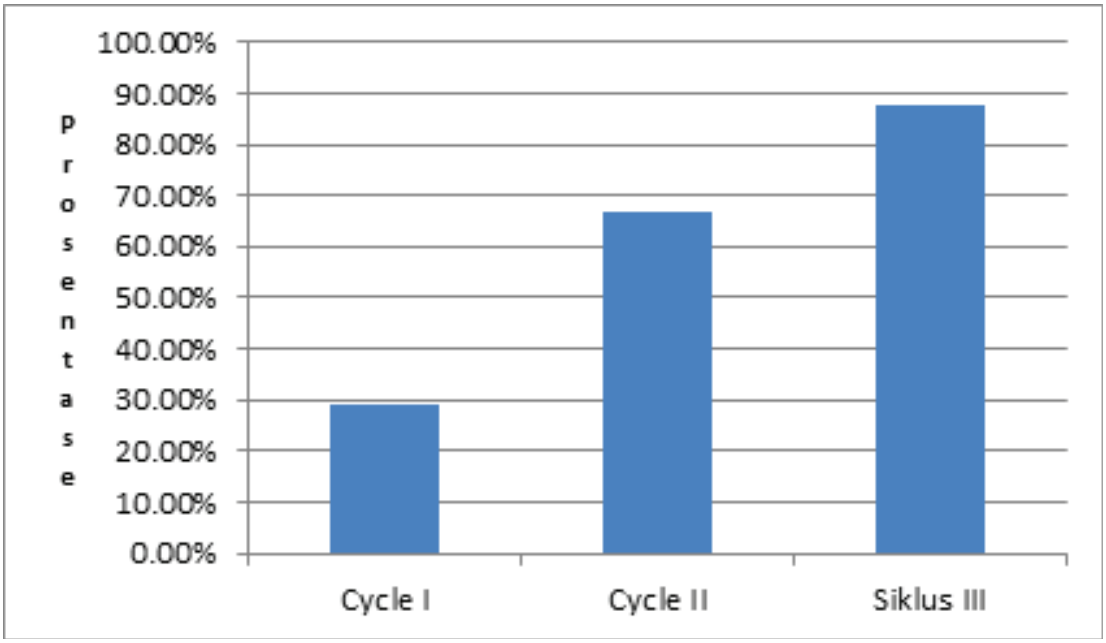

Figure 4: Improved Diagnostic Tests.

4.2. Discussion

Based on the results of classroom action research consisting of cycle I, cycle II and cycle III on learning mathematics using STAD model indicates an increasing role of active students. This is evident from student activity observation sheets on each cycle indicating an increase in the students' active role in each indicator. In addition there is also an increase in the number of students who play an active role of all indicators.

In the first cycle of mathematics learning process has not run well because there is no awareness of students. Students look passive, this can be seen from: when the researchers submit the material, there are students who look busy themselves and joking with friends next to him so as not to pay attention to explanations of researchers. Students have not dared to ask questions and also respond to researcher's questions. In addition, there is no group collaboration because there is no group sharing. When presenting the results of work, most students have not dared to advance to the front of the class. In addition at the time of concluding the results of the discussion of students have not dared to express his opinion.

In cycle II the learning process has been running better. After correcting the shortcomings of the learning cycle I using STAD model can increase the student's active role. Most students pay attention to the teacher's explanation, the students have already dared to interact with the teacher as well as with their friends. When presenting the results of the work has many students who dare to advance to the front of the class. In

addition, students also have the courage to express opinions at the time of concluding the results of the discussion.

In the third cycle of learning process running smoothly, students are already familiar with the model of looking for a partner who is taught. With the improvement in cycle II there is an increase of the students' active role in cycle III. All students pay attention to teacher's explanation. Student interactions with teachers and interactions between students work well. Students are scrambling to present their work. When concluding the results of the discussion most of the students dare to express an opinion.

5. Conclusion

Learning using the Student Team Achievement Division (STAD) learning model can enhance the student's active role. With the Student Team Achievement Division (STAD) learning model, students get as many opportunities as possible in exploring their ability and socialization so that they are active and able to find out, exchange ideas, and solve problems in discussion with their group so as to create a communicative learning activity.

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