Improving Mathematics Achievement and Students' Activity at Primary Level using STAD Learning Model

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Abstract: Improving mathematics achievement and students' activity at primary level using STAD model. Objectives: This study aims to improve the activities and learning outcomes of primary students using STAD model. **Methods:** The research subject were 42 of fourth grade students at SDN Salatiga 01 on 2017/2018 academic year. The data obtained in this study include qualitative and quantitative data. The research instruments used included the lesson plan, test instruments, and non-test instruments. **Findings:** The percentage of learning activities of students in the first phase was 77% and increased to 81.5% in the second phase. The percentage of classical learning completeness in the first and second phase were 67% and 76%, respectively. **Conclusions:** STAD model is effective to improve students' activity and mathematics achievement.

Keywords: STAD model, mathematics achievement, learning activity, primary school students.

Abstrak: Meningkatkan hasil belajar matematika dan aktivitas siswa sekolah dasar menggunakan model STAD. Tujuan: Penelitian ini bertujuan untuk meningkatkan aktivitas dan hasil belajar siswa sekolah dasar menggunakan model STAD. Metode: Subjek penelitian yaitu 42 siswa kelas 4 SDN Salatiga 01 pada tahun akademik 2017/2018. Data yang diperoleh dalam penelitian ini meliputi data kualitatif dan kuantitatif. Instrumen penelitian yang digunakan meliputi rencana pelaksanaan pembelajaran, instrumen tes, dan instrumen non tes. Temuan: Persentase aktivitas belajar peserta didik pada fase pertama sebesar 77% dan mengalami peningkatan menjadi 81,5% pada fase kedua. Persentase ketuntasan belajar klasikal pada fase pertama dan kedua berturut-turut adalah 67% dan 76%. Kesimpulan: Model STAD efektif dalam meningkatkan aktivitas dan prestasi belajar matematika siswa.

Keywords: Model STAD, prestasi matematika, aktivitas belajar, siswa sekolah dasar.

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■ **INTRODUCTION**

Primary school is a basic education level that serves as the laying of scientific foundations and helps optimize the development of students through teacher-guided learning. The current curriculum in Elementary Schools is Curriculum 2013. The curriculum 2013 requires learning to lead to student activities or student centered. The demands that must be faced in the 2013 curriculum are in the form of (1) conducting learning with the scientific approach, (2) forming character of students with Character Education Strengthening (3), learning activities containing literacy activities, (4) fulfilling 4C (creative, critical thinking, communicative, collaborative), (5) developing students' critical thinking skills / High Order Thinking Skill (HOTS). Implementation of the curriculum 2013 requires high creativity both in class planning and management.

Learning mathematics is not an easy thing to take for granted by students. The ability to accept lessons between students with each other is different. Students must be motivated to foster interest in learning and being trained to motivate themselves, especially in mathematics learning (Dignath & Büttner, 2008; Jang, 2008). Based on the results of observations using questionnaires, there are 19 of the 42 students in grade 4 at SDN Salatiga 01 thought that mathematics was a difficult and frightening learning. There are also those who argue that mathematics is boring learning. The teacher's task related to the demands of the curriculum 2013 is to change the mindset of students regarding mathematics learning. Classroom action research aims to make learning more interesting to be followed by the application of cooperative learning models especially in mathematics learning (Torrance & Pryor, 2001; Mettetal, 2002). The learning model that will be used is the Student Team Achievement Division (STAD).

The Student Team Achievement Division (STAD) learning model is one of the cooperative learning models in which there are several small groups of students with different levels of academic ability (Balfakih, 2003; Tarim & Akdeniz, 2008; Zakaria, Chin, & Daud, 2010). Not only academically, students are also classified according to gender, race, or ethnicity. The diversity is intended so that students can work together to complete learning objectives even with different backgrounds. The model is one of the cooperative learning models that can place students as part of a collaborative system to achieve optimal learning outcomes. The STAD model provides opportunities for students to be more active, happy, motivated, and able to understand the material (Wyk, 2010; Tarim & Akdeniz, 2008). Learning success is known through observing the activities and learning outcomes of students. The success of learning is also known through assessment of student learning outcomes. Students were asked to form heterogeneous groups of four to five members in the implementation of the Student Team Achievement Division (STAD) learning. Then after grouping is done, there are four syntax that must be done, namely (1) teaching, (2) study team, (3) tests, and (4) recognition (Wyk, 2010).

Based on the description of the problem, learning mathematics in elementary schools to be more interesting and meaningful for students requires the use of the right model, one of them is the Student Team Achievement Division (STAD). The purpose of the study was to implement the STAD model, namely to improve the quality of learning mathematics in elementary schools in the form of activities and learning outcomes of students. The expected condition after the implementation of the research by applying the Student Team Achievement Division (STAD) model is a more lively learning atmosphere. The interest in learning of students will be aroused so that the learning outcomes obtained will also increase.

■ METHOD

This research was in the form of classroom action research. Research conducted at SDN Salatiga 01, researchers collaborated with class 4 teachers. The parties who take action are researchers, while those who observe the action process are classroom teachers. Teachers in classroom action research share ideas, suggestions, and input. This was done in the preparation of the learning implementation plan. The researcher gave the idea of using STAD model to improve the quality of learning. During the implementation of learning, the teacher acts as an observer. Teachers observe researchers in carrying out learning by applying the STAD model.

This research was conducted in two cycles. Each cycle consists of three meetings. Cycle I consists of three meetings. The first meeting in the first cycle is used for the implementation of learning. The second meeting in the first cycle was used for the implementation of learning. The third meeting in the first cycle for the implementation of formative tests and reflection. Cycle II consists of three meetings. The first meeting in the second cycle was used for the implementation of learning. The second meeting in the second cycle was used for the implementation of learning. The third meeting in the first cycle for the implementation of formative tests and reflection. One meeting takes 2 x 35 minutes. The entire time required for conducting the action research with two cycles is 12 x 35 minutes.

The subjects studied in this class of action research are 4th grade students of SDN Salatiga 01 2017/2018 school year. The number of 4th grade students of SDN Salatiga 01 year 2017/2018 is 42 people, consisting of 18 men and 24 women . This class action research will be carried out in the Salatiga Elementary School 01. The school is located on Jalan Jalan Diponegoro 13, Salatiga, Sidorejo District, Salatiga City. The school is located on the main road edge of Salatiga City. This research was conducted in two cycles. Each cycle consists of three meetings. The study was conducted on March 22, 2018 until April 9, 2018. The first cycle of the first meeting was held on Thursday, March 22, 2018. The first cycle of the second meeting was held on Friday, March 23, 2018. The first cycle of the third meeting was held on Saturday, March 24 2018. The second cycle of the first meeting was held on Friday, April 6 2018. The second cycle of the second meeting was held on Saturday, April 7, 2018. The third meeting was held on Monday, April 9, 2018. Factors examined in this Classroom Action Research (CAR) namely the application of the Student Team Achievement Division (STAD) model in learning. The application of the model aims to improve the quality of learning in grade 4 of SDN Salatiga 01. There are two factors examined in this study. First, when the process of learning mathematics the material for measuring angles uses the Student Team Achievement Division (STAD) model. Second, the learning activities of students during mathematics learning angular measurement material using the Student Team Achievement Division (STAD) model.

The data sources used in this study were 4th grade students of SDN Salatiga 01 Elementary School. The research data sourced from the students was in the form of non-test and test data. Non-test data is the result of observation of learning activities of students during the learning process. While the test data is learning outcomes value data obtained at the end of each cycle. The document used in this study is a list of values and attendance list for grade 4 students of SDN Salatiga 01, lesson plan, and student activity sheets. The type of data used in this study are qualitative data and quantitative data. Qualitative data in this study is in the form of observations of learning activities of students. Quantitative data in this study are in the form of student learning outcomes

obtained from formative test scores in cycles I and II.

The researcher used several data collection techniques to obtain data that was relevant to the research problem. The technique used by researchers in collecting research data includes tests, and non-tests. The test technique is used to collect quantitative data, namely data on student learning outcomes. Tests in this study are referred to as formative tests conducted at the end of each learning cycle I and II. The form of the question in this formative test is an objective test. The purpose of using the test in this study is to measure the ability of students. Non-test techniques are used to collect qualitative data, namely data on student learning activities in learning. The thing observed is planning and implementation of learning.

After the data is obtained, the steps taken are analyzing the data. Data analysis is the activity of checking, studying, comparing existing data and making the necessary interpretations. The quantitative data in this study are the learning outcomes of student learning obtained from formative tests in cycles I and II. The formulas used to calculate this quantitative data include calculating multiple choice test scores, determining class averages, and complete learning percentages. The final value on a multiple choice formative test is obtained by dividing the number of correct answers by the total number of items then multiplied by one hundred. The average analysis of class results to find out the extent to which students' achievement of learning material can be known by summing all the scores of students and then getting the sum of all students. The percentage of learning completeness can be known by using the formula for the number of students who are completely divided by the number of students. Qualitative data is data obtained through observations of and activities of students in cycles I and II. This data is presented in the form of sentences based on the category which will produce a conclusion.

Learning activities of students are measured by conducting an analysis on the observation sheet of student activities. The percentage of scores obtained on the observation sheet is accumulated to determine how much students are active in participating in learning in each cycle.

Indicators of the success of learning mathematics can be known through the percentage of activities and learning outcomes of students. Defensive activities students' learning activities are said to increase if they meet the criteria for the classical attendance of students of at least 75%, the involvement / activity of students in following the minimum learning is 50%. The learning outcomes of students are said to be good if the average grade value of at least 70 classical minimum completion percentages is 75% with a score of> 70.

■ **RESULTS AND DISCUSSION**

The research was conducted in two cycles, which took place on March 22, 2018 until April 9, 2018. The research that had been carried out obtained data on test results and non-tests in each cycle. The test results are in the formative value of students obtained at the end of the cycle. Non-test results in the form of observational data on student learning activities and documentation.

Cycle I

The observation results of student learning activities in the form of data on the percentage of attendance of students and the percentage of learning activities of students. Observations were made as long as the students took part in the mathematics learning material for measuring angles using the Student Team Achievement Division (STAD) model. The percentage of attendees at the first meeting was 98%. The percentage of attendance at the second meeting is 100%. The percentage of attendees at the third meeting was 98%. The average percentage of attendance of students in the first

cycle was 98%. The percentage of attendance of students in the first cycle has reached the success indicator which is e" 75%. The results of observation of learning activities of students at the first meeting meeting reached 74% including the active category. Achievement of learning activities of students in the first meeting has met the indicators of success. However, this needs to be improved again because getting used to students still uses the Student Team Achievement Division (STAD) model.

Learning outcomes of students in the first cycle were measured by formative tests. The implementation of the formative test of the first cycle was carried out at the end of the first cycle of learning or at the third meeting. Students who have achieved the Minimum Completion Criteria (KKM) in cycle I are 28 people. The number of students who did not meet the KKM were 14 people. Complete percentage of classical learning from the number of students who scored> 70 or reached KKM by 70%. This shows that the implementation of the first cycle can be said to be less successful because one aspect has not met the indicator of success.

Based on the achievement of the first cycle it is necessary to improve learning in the second cycle so that there is an increase Deficiencies that occur in learning can be overcome by making improvements. The shortcomings in learning come from researchers and students. Weaknesses that come from researchers include: (1) researchers are still in the stage of adjusting to class conditions when implementing the learning stages of the Student Team Achievement Division (STAD) model, (2) researchers sometimes still use regional language to adjust students' understanding. Deficiencies originating from students include: (1) students still have difficulty understanding the learning stages by using the Student Team Achievement Division (STAD) model, (2) students are still hesitant, ashamed to ask questions, and reluctant to express opinions, (3) students have not shown the attitude of working together in groups, (4) students lack confidence when reading the results of group discussions in front of the class, (5) students sometimes still use regional languages when communicating in learning, (6) students lack of concentration when carrying out formative tests.

Cycle II

The observation results of student learning activities in the form of data on the percentage of attendance of students and the percentage of learning activities of students. Observations were made as long as the students took part in the mathematics learning material for measuring angles using the Student Team Achievement Division (STAD) model. The percentage of attendance at the first meeting is 100%. The percentage of attendance at the second meeting is 100%. The average percentage of attendance of students in cycle II is 100%. The percentage of attendance of students in the second cycle has reached the success indicator which is e" 75%. Attendance list of students in cycle II can be read in the attachment. The score of learning activities of students in cycle II can be obtained in the appendix. The results of observation of learning activities of students at the first meeting meeting reached 81% including the very active category. Achievement of learning activities of students in the first meeting has met the indicators of success. The observation results of learning activities of students at the second meeting reached 82% including the very active category. Achievement of learning activities of students in the second meeting has met the indicators of success. The average value of learning activities of students in the second cycle reached 81.5% including the very active category. This achievement has met the indicators of success. The indicator of success for the percentage of student learning activities is> 50%. The average student learning outcomes reached 73.83. The average value has met the indicators of success

of at least 70. The percentage of classical learning completeness reaches 76%. This percentage shows that the achievement of classical learning completeness is in accordance with the indicators of success, which is at least 75%.

Based on the results of data analysis on the implementation of cycle II actions, learning can be said to be successful. The aspects studied are in the form of student learning activities, student learning outcomes, and have met indicators of success. The percentage of learning activities of students in the second cycle increased when compared to cycle I. The percentage of learning activities of students in the second cycle was 81.5% with a very active category, while in the first cycle was 77% with the active category. The results of observations on the learning outcomes of students in the second cycle have met the indicators of success. Learning outcomes of students in the form of class average values have exceeded KKM. The acquisition of classical completeness in the first cycle was 67% and in the second cycle was 76%. The results of implementing the overall action have met the indicators of success. The results of data acquisition in the second cycle in the form of student learning activities, student learning outcomes, and considered satisfactory. Therefore, there is no need to take action in the next cycle.

Overall Research

Observation of learning activities of students in the first cycle is known that the percentage of learning activities of students is 47.49%. The percentage of learning activities of students is included in the medium category. But the acquisition of student learning activities still needs to be improved because the activity of students in certain aspects has not been achieved. The percentage of learning activities of students in the second cycle has increased. The percentage of learning activities of students

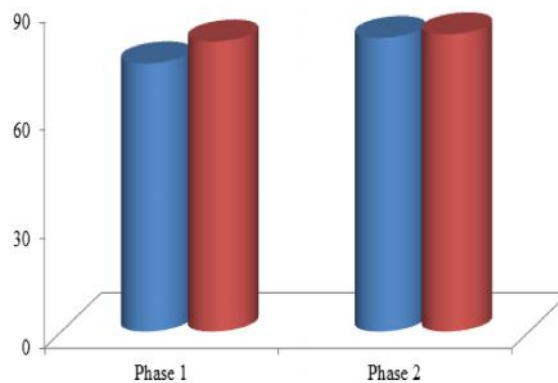in the second cycle was 81.5%. Increasing the percentage of student learning activities by 4.5.

Figure 1. Improvements of students' activity in phase 1 and phase 2 with first meeting (blue) and second meeting (red)

Based on table 3, the percentage of learning activities of students in the first cycle of the first meeting was 74% and at the second meeting 80%. The average percentage of learning activities of students in the first cycle was 77%. In the implementation of learning the second cycle of the first meeting, the percentage of learners' learning activities was 81% and the second meeting was 82%. The average percentage of learning activities of students in the second cycle was 81.5%. Increasing the percentage of learning activities of students between cycle I and cycle II of 4.5.

The average grade in the first cycle is 73.14 and in the second cycle is 73.83. This shows an increase in the class average value of 0.69. The percentage of classical learning completeness in the first cycle was 67% and in the second cycle was 76%. This shows an increase in the acquisition of classical learning mastery by 9. Learning outcomes of students experienced an increase in the implementation of the action cycle II. The average score obtained in the second cycle was 73.83 with a percentage of classical learning completeness of 76%. This increase occurred because in the

implementation of the second cycle of learning, students began to get used to the application of the Student Team Achievement Division (STAD) model. Learning outcomes obtained in cycle II are considered successful. This is evidenced by the learning outcomes of students who have achieved the specified success indicators. The average value of students' learning outcomes in the second cycle was 73.83. The percentage of classical learning completeness is 76%. Based on these results, the implementation of learning in the second cycle has been successful so there is no need to take action in the next cycle.

■ CONCLUSION

The application of the Student Team Achievement Division (STAD) model can improve the quality of mathematics learning. Improving the quality of learning includes learning activities of students. Learning activities of students have increased in each cycle. The percentage of learning activities of students in the first cycle was 77%. The percentage of students' learning activities falls into the active category. But the acquisition of student learning activities still needs to be improved because the activity of students in certain aspects has not been achieved. In the second cycle the learning activities of students increased to 81.5%. This percentage shows the learning activities of students in the second cycle including the active category. Increasing the percentage of learning activities of students from cycle I to cycle II of 4.5. The percentage of learning activities of students has reached a success indicator that is e" 50%.

Improvement of learning outcomes is indicated by an increase in the grade average and the percentage of classical learning completeness in each cycle. The results of this study indicate an increase in student learning outcomes from cycle I to cycle II. The average grade in the first cycle is 73.14 and the percentage of classical learning completeness is 67%. The average grade in the second cycle increased to 73.83 and the percentage of classical learning completeness became 76%. Both of these results indicate that in the second cycle there was an increase in the grade average and the percentage of classical completeness. The increase in class average value is 0.69 and the percentage of classical completeness is 9. This shows that the application of the Student Team Achievement Division (STAD) model can improve student learning outcomes in mathematics learning.

■ CONCLUSION

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