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# Student Team Achievement Division Learning Model and Student Process Skills

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***ABSTRAK***

*Masih banyak siswa yang kesulitan dalam belajar matematika. Hal ini disebabkan karena siswa merasa pembelajaran matematika sangat sulit. Masalah ini berdampak pada hasil belajar siswa yang rendah. Salah satu cara untuk memudahkan siswa dalam belajar yaitu dengan menggunakan model pembelajaran yang sesuai. Penelitian ini bertujuan untuk menganalisis perbandingan dan korelasi variabel respon siswa pada model pembelajaran student team achievement division materi balok dan kubus dan keterampilan proses siswa. Jenis penelitian ini adalah penelitian eksperimen kuantitatif dengan membandingkan empat kelas dengan menggunakan variabel keterampilan proses dan respon siswa terhadap hasil belajar tim siswa. Teknik pengambilan sampel menggunakan purposive sampling dengan jumlah sampel 144 siswa dari populasi dua SD Negeri dan dua SD Islam. Teknik yang digunakan untuk mengumpulkan data yaitu kuesioner. Instrument yang digunakan untuk mengumpulkan data yaitu angket. Analisis data yang digunakan adalah kuantitatif dengan bantuan statistik SPSS 25, untuk mencari statistik deskriptif, uji asumsi dan uji hipotesis. Berdasarkan uji-T diketahui bahwa terdapat perbedaan yang signifikan keterampilan proses siswa di masing-masing sekolah dan respon siswa terhadap model pembelajaran Student team achievement division pada volume balok dan kubus di masing-masing sekolah. Berdasarkan uji korelasi, terdapat hubungan antara keterampilan proses siswa terhadap respon siswa dengan model pembelajaran siswa pembagian prestasi beregu materi volume balok dan kubus antar sekolah.*

**ABSTRACT**

There are still many students who have difficulty learning mathematics. It is because students feel that learning mathematics is complicated. This problem has an impact on low student learning outcomes. One way to make it easier for students to learn is to use an appropriate learning model. This study aims to compare and correlate student response variables in the student team achievement division learning model of block and cube material and student process skills. This type of research is quantitative experimental research by comparing four classes using process skills variables and student responses to student team learning outcomes. The sampling technique used was purposive sampling with a sample size of 144 students from a population of two public elementary schools and two Islamic elementary schools. The technique used to collect data is a questionnaire. The instrument used to collect data is a questionnaire. The data analysis used was quantitative with the help of SPSS 25 statistics to find descriptive statistics, test assumptions, and test hypotheses. Based on the t-test, it is known that there are significant differences in students' process skills in each school and student responses to the Student team achievement division learning model on the volume of blocks and cubes in each school. Based on the correlation test, there is a relationship between students' process skills on student responses with the student learning model of team achievement division on the material of volume of blocks and cubes between schools.

## 1. INTRODUCTION

Education is very important in our life. Education is a very important thing in developing attitudes, achievements and the quality of human resources in order to create progress in the nation (Hekmah et al., 2019; Mahendra, 2017). Education is a continuous learning process in social activities to acquire knowledge, skills, attitudes and thinking abilities carried out by a person to develop individuals (Hidayat,

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2017; Rosidin et al., 2019). Education can be interpreted as an approach to improve the quality of education, by focusing on methods, teaching and learning (Campbell et al., 2017; Quay, 2017; Cai et al., 2020). In education, we must be familiar with Mathematics. Mathematics is a branch of education. Mathematics is part of education that studies natural phenomena and the way nature works (Susilawati et al., 2017; Suharta, 2019; Asrial et al., 2020; Laksana et al, 2020). Primary school mathematics learning can hone students' mathematical abilities to think logically, analytically, critically and systematically by improving the learning process (Nugraheni, 2017)(Surya, 2017; Wijaya et al., 2019). Mathematics subjects are less attractive because most students still think that mathematics is difficult (Arifah et al., 2019). Mathematics as a basic science in studying other sciences, the purpose of learning mathematics in elementary schools is to master predetermined competency standards and children are able to solve simple problems systematically (Maelasari & Wahyudin, 2017). However, in reality, many students still have difficulty learning mathematics (Abdiyani et al., 2019; Achdiyat & Utomo, 2018). The findings of previous studies also stated that students had great difficulty in learning mathematics (Aziz et al., 2020; Muna et al., 2017; Purnomo, 2016). It will impact students' everyday knowledge and poor thinking skills, so it impacts low student learning outcomes.

One of the factors that determine the success of mathematical results is the learning model used. Learning models are very diverse in education. The use of learning models greatly affects the process and learning outcomes (Brinus et al., 2019; Cahyaningrum et al., 2019; Hanifah et al., 2019). In learning students are required to experience for themselves, seek, try and draw conclusions on the process of the skills they do (Agustin, 2019; Akib et al., 2020; Falloon, 2020). In order for the learning objectives to reach the target properly, it is necessary to select appropriate learning methods and strategies (Mansur & Rafiudin, 2020; Oktaviani et al., 2018). There are several learning models that can be used, including Student team achievement division. Student team achievement divisionis one of the popular learning models used. The Student team achievement division model is a model that assigns students to form four or five member study teams mixed in performance level, gender, and ethnicity (Prananda, 2019; Rangkuti et al., 2019; Rulyansah et al., 2019). The development of learning models with the Student team achievement division.model greatly affects learning outcomes, is expected to increase students' understanding of concepts (Juraini et al., 2017; Yulianto et al., 2020; Zahro et al., 2018b). The Student team achievement division.type learning model is one of the learning models that is useful for fostering cooperative, creative, critical thinking and helping skills (Ariawan, 2018; Israil, 2019; Jaelani et al., 2019). In the STAD learning model, one group consists of a minimum of four and a maximum of five students who have good academic abilities and poor academic abilities (Kim, 2018). The use of the right learning model supports the formation of a learning process that is in line with the educator's plan.

Process skills are very important for every student to have. The process towards life skills requires an exercise and requires a process called process skills (Lusidawaty et al., 2020; Yusri, 2018; Asmi & Hasan, 2017). Skills are very important to generate new knowledge through learning activities to improve students' understanding (Vansteensel et al., 2017; Stender et al., 2018; Vartiainen & Kumpulainen, 2020). Process skills are processes designed in such a way that students understand facts, concepts, and relate them to the theories and attitudes of students themselves (Gunawan et al., 2019; Iswatun et al., 2017; Sakdiah et al., 2018). With good student skills, it will be easier for students to understand and succeed in accordance with educational goals. Teaching is the activity of implementing the educational curriculum to achieve the educational goals that have been set. To achieve these educational goals, a teacher as an educator has a very important role and influence for students in building student character at school and must be able to create an active, fun teaching and learning atmosphere and impress students in learning activities so that students can absorb and receive the knowledge they learn. get it as a provision for life later (Sholihat et al., 2017; Apriyanti Widiansyah, 2018). It is hoped that the next generation of quality will emerge and be able to make changes for the better in the life of the nation and state so as to create a generation that has life skills. One of the skills needed is the ability to solve problems (Anugrah et al., 2020; van den Heuvel et al., 2020; A Widiansyah, 2019) The existence of learning objectives can make it easier to deliver students to master concepts and relate these concepts to everyday life.

Previous research that is in line with the research currently being carried out by researchers, that learning mathematics really needs students' process skills in learning activities (Gasila et al., 2019; Siswono., 2017; Halimah et al., 2019). The previous research which showed that the type of cooperative learning had an effect on the success of process skills that would increase student activity and understanding (Dewi, 2017; Juraini et al., 2017; Widyaningrum & Harjono, 2019). The current research is also in line with previous research which shows that based on the results of data analysis, it can be concluded that learning mathematics with a cooperative model with STAD has implications for increasing mathematical understanding, better than using the classical model (Tiwow et al., 2020). In previous research, it was found that scientific knowledge and process skills have a simultaneous correlation with

creativity in solving problems (Zainuddin et al., 2020). Learning with cooperative models and STAD has a positive impact on interest in learning mathematics. The novelty of previous research and current research lies in the measured variables, where in previous studies measuring or comparing learning models, current research measures learning models with process skills of elementary school students in the mathematics subject of volume of blocks and cubes.

Ideally, the Student team achievement division learning model is expected to have a positive influence on students' process skills in learning mathematics. Given the field shows that learning mathematics is considered difficult by some elementary school children. In mathematics, students need process skills to make it easier to understand the lessons (Kamid et al., 2021). So that by applying the Student Team Achievement Division learning model, students can learn in teams and exchange information like peer tutors. From this, it is important to conduct research to determine the relationship between student responses to the Student team achievement division learning model in mathematics learning to student process skills and to determine the differences in student responses in each school to mathematics learning outcomes. The learning model of the division of student team achievements and differences in school students' process skills. in their respective schools. So this study aims to analyze the comparison of student responses to mathematics subjects on volume blocks and cubes using the STAD learning model in each school. Then to find out the comparison of students' skills in learning mathematics with the subject matter of blocks and cubes in each school. Furthermore, it aims to measure the relationship between students' responses to the STAD learning model and students' process skills on volume blocks and cubes in mathematics lessons.

## 2. METHOD

Type of research this is the study of quantitative experiments by comparing the four classes that use variable process skills and the students' response to the Student team achievement division model material volume of beams and cubes . Research is conducted in four schools namely 2 SD and 2 MI with each class numbered 36 students. So the overall total students that study this using a type of research quantitative comparative . The design of a procedure in quantitative research in which you administer a questionnaire to a small group of people (called a sample) to identify trends in attitudes, opinions, behaviors, or characteristics of a large group of people (Cresswell, 2014).

The research was conducted in four schools, namely SDN 52/I Kilangan II, SD Negeri 63/I Simpang Karmio, MIS Nurul Ehsan, MIS Nurul Jadid with 36 students in each class. In this study, samples were taken using purposive sampling technique. Purposive sampling is a type of sampling in which the research is more of a case of choice (Cresswell, 2014). The reason for this sampling technique is because not all samples choose criteria that match the phenomenon being studied. The most important thing in making a sample should be considering the analysis of the sample. The sample criteria are active students in elementary schools who are taking mathematics lessons on cubes and blocks and a sample of 36 students is obtained in each school. So the total number of students is 144 students.

Instruments that are used in research this is a sheet questionnaires were distributed in 4 classes in 4 schools. Instrument ratings are one of the instrument ratings realm of experiment latest in the field of assessment. There are 47 items inquiry skills processes and 26 item questions in a model of learning Student team achievement division which uses a scale likerrt 5. The scale that consists of 5 points to the model of learning with one (It is not good ), 2 ( not good ), 3 ( Pretty good ), 4 ( good ) 5 ( very good ), while 4 points for skills process with the 1 (very not good ), 2 ( not good ), 3 ( good ), and 4 ( very good ). Each statement is a representative of each process skill indicator and student response questionnaire with the Student team achievement division.model for the volume of blocks and cubes . The process skills questionnaire instrument used in this study is presented in Table 1. The process skill categories used in this study are presented in table 2. The description of the student response questionnaire instrument grid with the student team achievement division model for the volume of blocks and cubes is presented in Table 3.

**Table 1**. Instruments questionnaire skills of the SD and MI on the material volume of beams and cubes

| Variable | Indicator | No. Statement Items |
|---|---|---|
| Process Skills | Observation | 1,2,3 |
| | classify | 8,9,10,11,12 |
| | compiling table | 25, 26, 27 |
| **Number of Statements** | | **11** |

**Table 2.** Category of Student Process Skills

| Category Indicator Interval | Category | | |
|---|---|---|---|
| | **Observation** | **classify** | **compiling table** |
| Very Not Good | 3.0-5.3 | 5.0-8.8 | 3.0-5.3 |
| Not Good | 5.4-7.6 | 8.9-12.7 | 5.4-7.6 |
| Good | 7.7-10 | 12.8-16.2 | 7.7-10 |
| Very Good | 10.1-12.4 | 16.3-20.3 | 10.1-12.4 |

**Table 3 .** The student response questionnaire instrument grid with the student team achievement division model for the volume of blocks and cubes

| Variable | Indicator | Statement Item No. |
|---|---|---|
| Student responses with the student team achievement division model for the volume of blocks and cubes | spirit in follow learning | 1,2,3,4,5,6 |
| | Media use | 7,8,9,10,11,12,13 |
| | interest in studying science | 14,15,16,17,18,19,20 |
| | easy to understand the concept and importance of science | 21,22,23,24,25,26 |
| **Number of Statements** | | **26** |

**Table 4 .** Category of student response with the jigsaw model of speed and discharge material

| Category | Interval Indikator | | | |
|---|---|---|---|---|
| | **zeal in following the lesson learned** | **Media use** | **interest in studying science** | **easy to understand the concept and importance of science** |
| Not very good | 26.0-46.8 | 26.0-46.8 | 26.0-46.8 | 26.0-46.8 |
| Not good | 46.9-67.6 | 46.9-67.6 | 46.9-67.6 | 46.9-67.6 |
| Enough | 67.7-88.4 | 67.7-88.4 | 67.7-88.4 | 67.7-88.4 |
| Good | 88.5-109.2 | 88.5-109.2 | 88.5-109.2 | 88.5-109.2 |
| Very good | 109.3-130 | 109.3-130 | 109,3-130 | 109.3-130 |

This study uses quantitative data analysis with the help of SPSS statistics 25, the test is used to find descriptive statistics. The research method is basically a scientific way to obtain data with specific purposes and uses, one of which is to clarify various analytical processes using real calculation methods. (Suharsaputra, 2012). Next, identify the results for follow-up. At the data collection stage, questionnaires were given to 144 students at SD Negeri 52/I Kilangan II, SD Negeri 63/I Simpang Karmio, MIS Nurul Ihsan, MIS Nurul Jadid. From this data, data analysis is then carried out, namely data coding, filtering appropriate data and analyzing the data. This study uses quantitative data. Then this data will be analyzed using a descriptive test to find out the student's response then the assumption test is carried out starting from the normality and linearity test. If the data being tested is normal and linear data, then it ends with a hypothesis test to see whether there is a significant relationship and comparison by conducting a T test and a correlation test. Images or representations of large amounts of data which include mean, median, max and min are descriptive statistics (Pramesti et al., 2018; Santoso et al., 2019; Wahyuni. 2020).

## 3. RESULT AND DISCUSSION

### Result

Based on data analysis, the process skills of SD/MI students with observation indicators showed that the average response of students was in the good category with the percentage for SD N 52 38.9% good, SDN 63 38.9% good, MIS NI 36.1% good, MIS NJ 36.1% good, so it can be concluded that SDN 63 Dominant is good. Based on data analysis, the process skills of SD/MI students with measuring indicators found that the average number of students chose the good category with the percentage for SD N 52 30.5% good, SD N 63 41.7% good, MIS NI 47.2% good, MIS NJ 36.1% good, so it can be concluded that MIS NI Dominant is better. Based on data analysis, the process skills of SD/MI students with indicators in compiling tables, it was found that the average number of students chose the good category with the percentage for SD N 52 38.9% good, SD N 63 38.9% good, MIS NI 36.1% good, MIS NJ 36.1% good, so it can be concluded that SDN 63 Dominant is better. Description Model learning STAD against the material volume beams and cubes found that the average student many choose simply by percentage for SD N 52 73.6% enough, SD N 63

61.6% Enough, enough 45% NI MIS, MIS NJ 43.1% good, so it can be concluded that SDN 52 Dominant is better.

Normality test is a test used to see whether the data is normally distributed , if the significance value is > 0.05 then the data is normally distributed, if the significance value is < 0.05 then the data is not normal . The results of the normality test are shown in the following table. Based on data analyzis, in the obtained test for normality with Kolmogorov- smoniv test the value of significance > of 0.05, then it can be concluded the data distribution is normal. Linearity test is done in order to see the linear relationship between two or more variables. Conditions in this test , if the significance value > 0.05. Based on data analysis, the results of the linearity test obtained are the significance value for SD Negeri 52/I Kilangan II which is 0.087, SD Negeri 63/I Simpang Karmio is 0.112, MI S Nurul Ihsan is 0.097, and MIS Nurul Jidad is 0.078 then these results have meet the requirements > 0.05 so that it can be concluded that there is a linear relationship between elementary school students' process skills and student responses to the student team achievement model on the material for dividing the volume of blocks and cubes.

T test was conducted in order to know the difference between the variables on the material of multiplication of fractions . Terms of the test is if the value of the significance of < 0:05 then it can be said that the variable that coined the difference . If the significance value > 0.05 then the variable does not have a significant difference. The results of the Process Skills T test for SD Negeri 52/I Kilangan II and SD Negeri 63/I Simpang Karmio are presented in Table 5.

**Table 5 .** Process Skills T Test for SD Negeri 52/I Kilangan II and SD Negeri 63/I Simpang Karmio

| Class | N | Mean | Sig. | Sig. (2-tailed) |
|---|---|---|---|---|
| SD Negeri 52/I Kilangan II<br>SD Negeri 63/I Simpang Karmio | 7 2 | 120.50<br>111.12 | 0.643 | 0.0312 |

Based Test T may ter see that there is a difference between the skills of the SD Negeri 52 / I Kilangan II and SD Negeri 63 / I Simpang Karmio . This is evidenced by the value of sig (2-tailed) < 0.05. The T test for the Process Skills of MI S Nurul Ihsan and MIS Nurul Jidad are presented in Table 6.

**Table 6 .** T-Test Process Skills for MIS Nurul Ihsan and MIS Nurul Jidad

| Class | N | mean | Sig. | Sig. (2-tailed) |
|---|---|---|---|---|
| MI S Nurul Ihsan<br>MIS Nurul Jidad | 72 | 118.14<br>123.47 | 0.853 | 0.0185 |

Based on the T test may ter see that there is a difference between process skills MI S Nurul Ihsan and MIS Nurul Jidad. This is evidenced by the value of sig (2-tailed) < 0.05. In testing this is done in order to determine the relationship variables on material fractional multiplication. Terms of the test is if the value of the significance of > 0.05 then it can be said that the variables are not coined relationship . If the value of the significance of <0.05 then the variables that have a relationship that is significant. The test kore l ation Skills Process elementary school students and students of MI in the expose as in the Tabel 7.

**Table 7.** Process Skills Correlation Test for Elementary School Students and MI students

| School Level | N | Pearson Correlation | Sig. (2-tailed) |
|---|---|---|---|
| SD * MI | 144 | 0.632 | 0.042 |

Based on the results of correlation can be ter see that there is a relationship between process skills of elementary school students and students of MI . This is evidenced by the value of sig (2-tailed) < 0.05.

**Discussion**

The research conducted by the researcher is about the process skills and student responses by using the STAD model for the volume of blocks and cubes. Cooperative learning is a learning model that applies a grouping system or small team, which is between four to six people with different academic backgrounds, gender, race, or ethnicity (Ariani, 2017; Juraini et al., 2017; Juwıta et al., 2018). The STAD method is the simplest application method in the cooperative learning model (Agustina, 2015; Juraini et al., 2017; Widiyarto, 2017). For a teacher who is still a beginner in implementing cooperative learning, it would be better to use this method because the steps are still simple and do not take too long (Alman, 2017; Hijrihani & Wutsqa, 2015). The STAD Cooperative Learning Model is a cooperative learning approach that is active in activities and interactions among students to motivate and assist each other in mastering subject

matter to achieve maximum achievement (Anggraini et al., 2018; Suherti & Tsuroya, 2019; Zahro et al., 2018a). Teachers who use STAD submit new academic information to students every week using verbal or text presentations (Jubaedah, 2017; Laksono et al., 2016).

In this study, the researcher used the variable Process Skills with indicators of observation, classification, and compiling tables, so that it could be used as a basis and reference in researching to examine other process skills and models for dividing student team achievements in mathematics. The subject matter, namely the volume of blocks and cubes. In this study, three process skills indicators were used, and the indicators commonly used to distribute student team achievements. Because if students have a positive interest in process skills and models for dividing student team achievements with math subject matter, the volume of blocks and cubes is expected to improve learning outcomes. Mathematics learning outcomes are essential in a learning and teaching process because they can measure changes in cognitive, affective, and psychomotor abilities that are achieved or mastered by students after participating in the teaching and learning process (Aziza, 2019; Muhtadi et al., 2018; Pratama & Retnawati, 2018). Mathematics has many benefits in humans because the mathematical way of thinking is systematic, through regular and specific sequences (Fasha et al., 2018; Putri et al., 2019; Setiawan, 2020).

This research can also help prospective teacher students understand student Process Skills to the STAD learning model, applied to mathematics learning with block and cube volume material in several student development courses. Implications Student process skills using the STAD learning model make students more active in learning and work well together in groups to solve problems (Maelasari & Wahyudin, 2017; Septian et al., 2020; Yulianto et al., 2020). From the results of hypothesis testing, it can be seen that there is a relationship between student responses in the STAD learning model to students' process skills in mathematics. This research is in line with other research, however, there are some differences and updates in this study, because previous research did not discuss more specifically about the indicators used in process skills as used in this study, the indicators used were observation tables, classifying and compiling tables used in this study (Gasila et al., 2019; Mahmud, 2017; Siswono, 2017b). The material studied is the volume of blocks and cubes which are studied with the STAD learning model at the elementary school level. And this research is an update from previous research by measuring comparisons or differences and correlations between student responses to the STAD learning model and elementary school students' process skills in mathematics. In previous research, relevant to the current research, namely regarding student responses to the STAD learning model, it was found that the STAD model assisted by the Quizizz media has the potential to overcome problems of motivation and student learning outcomes (Yulianto et al., 2020). With this, the researchers conducted this research by applying the STAD learning model in mathematics. but in previous studies only examined student responses to social studies learning in high school with the STAD learning model. So the current study was carried out as an update from previous research to be able to see how the relationship between student responses to STAD learning applied to mathematics lessons in elementary schools.

## 4. CONCLUSION

There were significant differences in student process skills in each school and also in student responses to the block and cube volume STAD learning between schools models. There was a relationship between students' process skills and student responses to the STAD learning model for the interschool volume of blocks and cubes. So it is hoped that learning with the STAD model can improve students' process skills, seeing that there is a strong relationship between student responses to learning and the STAD learning model to students' process skills, especially in learning mathematics.

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