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# The Influence of the Student Teams Achievement Divisions (STAD) Approach on Assurance, Relevance, Interest, Assessment, and Satisfaction in Improving Mathematical Understanding

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**Abstract:** The ability to understand mathematics is a fundamental skill that every student must possess, as it helps them master other mathematical concepts. However, many students demonstrate low mathematical comprehension skills. One contributing factor to this issue is the use of learning models that fail to provide students with opportunities to actively engage in the learning process. This often results in difficulties for students in understanding mathematical material. Therefore, a solution is needed to address this problem, one of them is the application of the Student Teams Achievement Divisions (STAD) cooperative learning model combined with the ARIAS approach. This research aims to examine the mathematical understanding abilities of eighth-grade students on function material by applying the STAD cooperative learning model with the ARIAS approach. The research population consisted of all eighth-grade students at MTs Ma'arif NU 1 Sokaraja. Using a convenience sampling technique, the research sample included 53 students: class VIII A as the experimental group and class VIII B as the control group. This study employed a quantitative research method with an experimental design using a pre-test and post-test control group setup. Data collection was conducted through observation and tests in the form of pre-tests and post-tests. The collected data were analyzed using t-test for two independent samples, preceded by prerequisite tests such as normality and homogeneity tests. The analysis revealed a significance value of 0.000 in the post-test data, which is less than 0.05, indicating a significant difference between the average scores of the experimental and control groups. Based on these findings, it can be concluded that the STAD cooperative learning model combined with the ARIAS approach positively impacts the mathematical understanding abilities of eighth-grade students.

**Keywords:** mathematical understanding ability; ARIAS models; STAD model



## A. Introduction

The rapid development of science and information and communication technology era The current global climate has an impact on the acceleration of changes in society's demands in various ways aspect of life. The demands of global society indirectly make the world become competition in creating various innovations to support aspects of life. Need There are efforts to keep pace with the rapid growth of science and technology in the 21st century, namely by preparing quality, superior and creative human resources. Education is a valuable vehicle and

investment in efforts to improve quality of human resources. Increasing human resources is supported by improving the quality of education, because of huma is the main product of education (Sutiawan, 2009). So, it can be concluded that through quality education and being able to develop students' potential.

Through quality education, a nation can face a bright future better. However, currently Indonesia is facing major challenges internal, namely related to the quality of education. It could be said that the quality of education is still low resulting in a low level of ability to face global life competition which has an impact on the progress and prosperity of the country's existence. Learning needs to be designed to be structurally aligned with the learning process which emphasizes active student learning (Hailikari et al., 2022).

To be able to make changes to improve the quality of education, it is necessary the existence of learning that guides students to be able to think critically, logically, systematically, and creative so that they can face various challenges independently with full sense self-confidence (Hirzi et al., 2022). These competencies are needed so that students can have and develop the ability to acquire, manage and utilize capabilities to live in circumstances that are always changing, uncertain, and competitive. these competencies can be obtained through learning mathematics. Mathematics is a universal science that underlies the development of modern technology, has an important role in various disciplines and advances human thinking power (Kusumaningsih, 2022). The rapid development in various aspects of life today also based on developments in mathematics. What is expected to emerge is the ability to understand mathematics. One of the goals of learning mathematics According to Santrock who stated in the book Hendriana (2021) states that the ability to understand concepts are the main aspect of learning. As a fundamental aspect, ownership This ability really supports the development of students' mathematical abilities others (Hendriana et al., 2021). Comprehension is not just about memorizing, understanding information, but more than capable of giving meaning and representing it again information received in different forms.

However, facts in the field show that students' mathematical understanding is still poor low, there are still many students who misunderstand mathematical concepts. That too happened to students at MTs Ma'arif Nu 1 Sokaraja. One mathematics teacher said that, students' mathematical understanding abilities, especially class VIII, are still low. Teacher Students have difficulty understanding teaching material. the teacher has to repeat it over and over again explain the material being taught and sometimes even have to repeat the material previously still within its scope. Apart from that, the comprehension ability is low mathematics is also characterized by students having difficulty explaining a concept again, students Difficulty classifying statements according to the prerequisites that form a statement concept, students have difficulty in making examples according to the concept, students have difficulty in represent a statement in the form of a mathematical representation, and students still confused about how to solve story problems according to the algorithm in the concept. This can happen due to lack of practice working on questions, lack of motivation to learning, less interested in the learning model applied by the teacher or activities Learning does not provide opportunities for students to be actively involved learning.

Students' low mathematical understanding abilities will not improve as well immediately, but requires teacher intervention in it. Deal with this, teacher can make several choices regarding the application of the model. Alternative learning models which is thought to be able to facilitate students to improve their understanding abilities mathematically based on the problem description above is a type of cooperative learning model STAD with the ARIAS approach.

The STAD type cooperative learning model is one type of learning cooperative applied to deal with the heterogeneity of student abilities. process learning divides students into several groups containing 4-5 people with varying abilities for collaboration and elaboration with peers within solving problems (Gusniar, nd). Through the STAD type cooperative model, student difficulties are overcome in understanding concepts can be overcome because smarter students can become tutors peers for their group friends during the discussion process. Apart from that, there is Assessment encourages students to play an active role in mastering the material independently, not above group name, because group success is obtained based on the development of the score quiz each member. And having awards for the best groups can motivate students to study the material taught. Apart from that, by using the ARIAS approach in the learning process will make students actively construct concepts because has been provided with teaching that prioritizes aspects of assurance, relevance and interest. The aim is to attract students' interest in learning by knowing the relationship between The material taught is related to everyday life, motivating students to continue increase students' self-confidence during learning to play an active role. Cooperative type STAD with the ARIAS approach, a combination of both learning models, will help students to improve mathematical understanding through peer tutoring in collaboration groups and teacher teaching as initial capital of knowledge.

Based on the description of the problem above, it is important to carry out this research, this is in line with the importance of students' possession of mathematical understanding abilities. Therefore It is necessary to apply the STAD type cooperative learning model with the ARIAS approach as an effort to improve the mathematical understanding abilities of class VIII students by conducted research entitled "The influence of the STAD type cooperative learning model with the ARIAS approach to increasing students' mathematical understanding abilities class VIII at MTs Ma'arif NU 1 Sokaraja".

## B. Methods

The type of research used in this research is quantitative research with apply experimental methods. Experimental research is a research activity with The aim is to assess the influence that arises on students as a result of being given a action or testing a hypothesis between an action and another action as comparison (Payadnya & Jayantika, 2018). The treatment in question is the application of the model STAD type cooperative learning with the ARIAS approach. In this research, which being the independent variable is the STAD type cooperative learning model with the approach ARIAS and the dependent variable are students' mathematical understanding abilities.

The design used in the research was Pre-test and Post-test Control Group. The research began by giving a pre-test to the experimental and control classes before given treatment. Then

treatment is given in the form of implementing a learning model STAD type cooperative with the ARIAS approach in experimental and method classes conventional in the control class. The next step is that both classes are given a post-test for find out the increase in students' mathematical understanding abilities after it is carried out different treatment.

The research was conducted at MTs Ma'arif Nu 1 Sokaraja which is located on Jl. Kyai Akhmad Mursyid Dusun II RT 04/03 Sokaraja Lor Village, Sokaraja District, Banyumas Regency, in the odd semester of the 2023/2024 academic year from 03 September-10 October 2023. The population in this study were students of class VIII MTs Ma'arif Nu 1 Sokaraja consists of 5 classes, namely classes VIII A, VIII B, VIII C, VIII D, and VIII E with the number of students a total of 120. A sample is a subset of the population that represents the whole symptoms observed by researchers (Haryana & Novianti, 2020). Through convenience sampling techniques where respondents are taken based on convenience and willingness to spend time help researchers (Malawi & Maruti, 2016). From the five classes, researchers took samples from class VIII A, totaling 30 students as the experimental class and class VIII B totaling 25 students as the control class.

The data used in this research was obtained through observation and test activities. Observation is a data collection technique through careful observation and recording systematically (Malawi & Maruti, 2016). Observations were carried out by two observers. Meanwhile, the test instrument used is a description test, namely a test that contains a series questions whose answers are descriptive or explanatory. Description test applied to The experimental and control classes were in the form of a pre-test given before carrying out the research. Meanwhile, the post-test is given after the research is carried out.

Data obtained through observation and tests are then analyzed. Observation data used to analyze how researchers' activities apply the model STAD type cooperative learning with the ARIAS approach through scoring observation sheet. Meanwhile, to find out whether there is an influence of cooperative type STAD with the ARIAS approach to improving mathematical understanding abilities students are tested by testing pre-test data and post-test data using prerequisite tests and t-test. The prerequisite tests are the normality test and homogeneity test. All three tests were carried out using the help of the SPSS version 23 application. The normality test was used to test whether the data for both classes is normally distributed or not. Decision making criteria if the data is normally distributed so the significance value is $\geq 0.05$. On the other hand, if the value is significant $\leq 0.05$ then the data is not normally distributed (Muhammad Aqil & Efendi, 2021). Meanwhile, test homogeneity to test whether the data for both classes come from a population with variance the same or not. The test decision making criteria is if the value is significant Homogeneous test $> 0.05$ means the data variance is homogeneous. On the other hand, if the significance value of the test homogeneous $< 0.05$, then the data variance is not (Muhammad Aqil & Efendi, 2021). After test The prerequisites are met, namely normal and homogeneous distribution, then the data is analyzed with t-test. The way the analysis works with the t-test is to compare the class average values experimental and control class average values. The decision making criteria in the t-test are: if the significance value (2-tailed) $> 0.05$ then H 0 is accepted and H 1 was rejected (Susanto, 2010). The hypothesis is as follows:

H0 : $\mu 1 = \mu 2$: There is no difference in the average value between the control class and the experimental class

H1 : $\mu\ 1 \neq \mu\ 2$ : There is a difference in the average value between the control class and the experimental class.

## C. Results and Discussion

### 1. Data Analysis Description of the Application of the Type Cooperative Learning Model STAD with the ARIAS Approach

Researchers apply the STAD type cooperative learning model with an approach ARIAS in the experimental class. At the same time two observers made observations of researcher activities in implementing the learning model used. ability level research in teaching is calculated by adding up the total scores which are then divided The number of aspects in the observation sheet is 11. The following are guidelines for decision making Researcher ability criteria:

**Table 1. Criteria for Researcher Ability**

| Ability Level | Criteria |
|---|---|
| $3{,}25 \leq x \geq 4{,}00$ | Excellence |
| $2{,}5 \leq x \geq 3{,}25$ | Good |
| $1{,}75 \leq x \geq 2{,}5$ | Weak |
| $1 \leq x \geq 1{,}75$ | Enough |

Results of observations by two observers regarding the application of the cooperative learning model STAD type with the ARIAS approach can be seen from the table as follows:

**Table 2. Number of School Samples based on Research Locations**

| No | Observed | Observer 1 | Observer 2 | Average |
|---|---|---|---|---|
| 1 | Opening greetings and prayer | 4 | 4 | 4 |
| 2 | Attending to student attendance | 4 | 4 | 4 |
| 3 | Provide motivation to in till an attitude of self-confidence and play active role during learning | 3 | 4 | 3,5 |
| 4 | Presenting material and convey goals and benefits learning | 3 | 3 | 3 |
| 5 | Form students into groups small and guide the discussion | 4 | 4 | 4 |
| 6 | Provide student opportunities ask | 4 | 4 | 4 |
| 7 | Provide student opportunities present and respond discussion results | 4 | 4 | 4 |
| 8 | Guiding in concluding the material what was studied | 3 | 3 | 3 |
| 9 | Give quizzes to students | 3 | 3 | 3 |
| 10 | Give credit to best group | 4 | 4 | 4 |
| 11 | Close the lesson with prayer and greetings | 4 | 4 | 4 |
| | Total | 40 | 41 | 40,5 |
| | Average | 3,63 | 3,72 | 3,68 |

Based on the table above, the results of observations made by observer 1 and observer 2 respectively obtained scores of 3.63 and 3.72 with the average score for both of them being

3.68. According to the scoring guidelines in table 12, the average value obtained by the researcher is in the interval $3.25 \leq x \geq 4.00$, which means the researcher's ability to apply the STAD type cooperative learning model with the ARIAS approach implements this method Very good.

## 2. Data Analysis of the Influence of the STAD Type Cooperative Learning Model with ARIAS Approach

The data used to measure the effect of the cooperative learning model type STAD with the ARIAS approach consists of pre-test and post-test result data from the class experimental and control class. Here's the explanation:

### a. Analysis of Pre-test Data for Experimental Class and Control Class.

Pre-test data was obtained before implementing the STAD with the ARIAS approach in the experimental class and conventional methods in the class control. The results of the pre-test data are presented in the following table:

**Table 3. Data on *Pre-test* Score for Eksperimental Class and Control Class**

| No. | Class Code Experiment | *Pre-test Score* | Class Code Control | *Pre-test Score* |
|---|---|---|---|---|
| 1 | A1 | 33,3 | B1 | 60,0 |
| 2 | A2 | 46,7 | B2 | 33,3 |
| 3 | A3 | 53,3 | B3 | 46,7 |
| 4 | A4 | 66,7 | B4 | 26,7 |
| 5 | A5 | 26,7 | B5 | 53,3 |
| 6 | A6 | 33,3 | B6 | 26,7 |
| 7 | A7 | 53,3 | B7 | 33,3 |
| 8 | A8 | 66,7 | B8 | 60,0 |
| 9 | A9 | 60,0 | B9 | 20,0 |
| 10 | A10 | 40,0 | B10 | 40,0 |
| 11 | A11 | 60,0 | B11 | 33,3 |
| 12 | A12 | 46,7 | B12 | 53,3 |
| 13 | A13 | 60,0 | B13 | 66,7 |
| 14 | A14 | 20,0 | B14 | 53,3 |
| 15 | A15 | 40,0 | B15 | 66,7 |
| 16 | A16 | 53,3 | B16 | 46,7 |
| 17 | A17 | 26,7 | B17 | 46,7 |
| 18 | A18 | 66,7 | B18 | 40,0 |
| 19 | A19 | 33,3 | B19 | 46,7 |
| 20 | A20 | 20,0 | B20 | 40,0 |
| 21 | A21 | 20,0 | B21 | 46,7 |
| 22 | A22 | 33,3 | B22 | 53,3 |
| 23 | A23 | 26,7 | B23 | 46,7 |
| 24 | A24 | 40,0 | B24 | 26,7 |
| 25 | A25 | 26,7 | B25 | 40,0 |
| 26 | A26 | 60,0 | B26 | 46,7 |
| 27 | - | - | B27 | 46,7 |

Statistical results of the mathematical understanding ability scores for both classes are presented following table:

**Table 4. Statistical Data on *Pre-test Score***

| Description | Experimental Class | Control Class |
|---|---|---|
| Amount of Students | 26 | 27 |
| Highest Score | 66,7 | 66,7 |
| Lowest Score | 20,0 | 20,0 |
| Total Score | 1113,3 | 1180,0 |
| Average | 42,8 | 43,7 |

Based on the statistical table above, it shows that the pre-test scores for both classes has the lowest and highest values of 20.0 and 66.7. In the experimental class it was obtained The average score was 45.4 with a total of 26 students, while in the control class with the number of students was 27 people, the average score was 43.7. The difference in the average pre-test scores between the tw is 0.9 which indicates that the initial abilities possessed by students are not much different or can be called the same. To prove that the initial abilities of students in both classes are the same Hypothesis testing is carried out using the t-test through prerequisite tests in the form of normality tests and t-tests homogeneity, here is the explanation:

1) Normality Test

the normality test is used to find out whether the data comes from the same population normally distributed or not. The normality test used uses the KolmogorovSmirnov with the help of SPSS version 23. Data is said to be normal if the test value is significant Kolmogorov-Smirnov ≥ 0.05. The following are the results of the pret-test data normality test for the experimental class and control:

**Table 5. *Pre-test* Data Normality Test Result**

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Hasil | .119 | 53 | .061 | .943 | 53 | .014 |

a. Lilliefors Significance Correction

Based on table 4.5, the Kolmogorov Smirnov column shows the significance value the pre-test data for the experimental and control classes was 0.061, indicating a significance value of ≥ 0.05. So it can be concluded that the pre-test data is normally distributed.

2) Homogeneity Test

The homogeneity test was carried out to find out whether the data for the two classes came from population with the same variance or not. Homogeneity testing in this research using the Levene test assisted by the SPSS version 23 application. Data is said to be homogeneous if it is homogeneous homogeneous test significance > 0.05. The following are the results of the homogeneity test of the experimental class pre-test da and control speed:

**Table 6. *Pre-test* Data Homogeneity Test Result**

**Test of Homogeneity of Variance**

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| Hasil | Based on Mean | 3.387 | 1 | 51 | .072 |
| | Based on Median | 2.768 | 1 | 51 | .102 |
| | Based on Median and with adjusted df | 2.768 | 1 | 50.999 | .102 |
| | Based on trimmed mean | 3.367 | 1 | 51 | .072 |

The table above shows a significance value of 0.821. This matter shows that the significance value obtained is more than 0.05, then H0 is accepted and H 1 rejected. Thus, we can conclude that there is no significant difference between the pre-test scores of the experimental class and the control class, it could be said to be ability the mathematical understanding of students in both classes is the same. So the type of cooperative learning model STAD with the ARIAS approach can be applied in experimental and methods classes conventionally applied to the control class

3) T-test

In the t-test the researcher used two hypotheses, namely:

H0 : $\mu 1 = \mu 2$: There is no difference in the average value between the control class and the experimental class

H1 : $\mu\ 1 \neq \mu\ 2$ : There is a difference in the average value between the control class and the experimental class.

T-test decision making criteria, namely if the significance value (2-tailed) > 0.05 then H 0 accepted and H1 rejected. The following are the test results on the pre-test data for both classes:

**Table 7. T-test Result Pre-test Data**

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Hasil | Equal variances assumed | 3.387 | .072 | .227 | 51 | .821 | .8880 | 3.9156 | -6.9729 | 8.7490 |

The table above shows a significance value of 0.821. This matter shows that the significance value obtained is more than 0.05, then H0 is accepted and H 1 rejected. Thus, we can conclude that there is no significant difference between the pre-test scores of the experimental class and the control class, it could be said to be ability the mathematical understanding of students in both classes is the same. So the type of cooperative learning

model STAD with the ARIAS approach can be applied in experimental and methods classes conventionally applied to the control class.

**b. Post-test Data Analysis for Experimental Class and Control Class**

Post-test data was obtained after applying the learning model to the experimental class and control class. This data is used to measure students' final abilities regarding the subject mathematical understanding ability after being given different treatment. As for postThe test is presented in the table as follows:

**Table 8. Data Nilai *Post-test***

| No. | Class Code Experiment | *Post-test Score* | Class Code Control | *Post-test Score* |
|---|---|---|---|---|
| 1 | A1 | 66,7 | B1 | 66,7 |
| 2 | A2 | 66,7 | B2 | 53,3 |
| 3 | A3 | 93,3 | B3 | 60,0 |
| 4 | A4 | 86,7 | B4 | 46,7 |
| 5 | A5 | 60,0 | B5 | 53,3 |
| 6 | A6 | 73,3 | B6 | 53,3 |
| 7 | A7 | 93,3 | B7 | 73,3 |
| 8 | A8 | 86,7 | B8 | 73,3 |
| 9 | A9 | 73,3 | B9 | 46,7 |
| 10 | A10 | 60,0 | B10 | 86,7 |
| 11 | A11 | 86,7 | B11 | 46,7 |
| 12 | A12 | 80,0 | B12 | 73,3 |
| 13 | A13 | 86,7 | B13 | 80,0 |
| 14 | A14 | 60,0 | B14 | 60,0 |
| 15 | A15 | 86,7 | B15 | 80,0 |
| 16 | A16 | 73,3 | B16 | 60,0 |
| 17 | A17 | 80,0 | B17 | 53,3 |
| 18 | A18 | 93,3 | B18 | 66,7 |
| 19 | A19 | 60,0 | B19 | 53,3 |
| 20 | A20 | 73,3 | B20 | 46,7 |
| 21 | A21 | 60,0 | B21 | 86,7 |
| 22 | A22 | 66,7 | B22 | 80,0 |
| 23 | A23 | 80,0 | B23 | 66,7 |
| 24 | A24 | 66,7 | B24 | 46,7 |
| 25 | A25 | 66,7 | B25 | 53,3 |
| 26 | A26 | 86,7 | B26 | 66,7 |
| 27 | - | - | B27 | 46,7 |

Statistical results of mathematical understanding ability scores for experimental classes and classes The control class on the post-test questions is presented in the following table:

**Table 9. Statistical Data on *Post-test Value***

| Criteria | Experiment Class | Control Class |
|---|---|---|
| Amount of Students | 26 | 27 |
| Highest Score | 93,3 | 86,7 |
| Lowest Score | 60,0 | 46,7 |
| Total Score | 1966,7 | 1680,0 |
| Average | 75,6 | 62,2 |

The table above shows that there are differences in post-test scores in the classes sample. The experimental class had the highest and lowest scores of 93.3 and 60.0 respectively The

average score obtained from 26 students was 75.6. Meanwhile, the control class has value The highest and lowest were 86.7 and 46.7 with an average value of 62.2 obtained of 27 students. The difference in average scores between classes is 13.4 which indicates ability Mathematical understanding in students after being given treatment in the learning process different. This will be proven through prerequisite tests and t-tests as follows:

1) Normality Test

The normality test is used to test whether the experimental class and post-test data the control class is normally distributed or not. This research uses the KolmogorovSmirnov with the help of SPSS 23. Following are the results of the post-test data normality test:

**Tabel 10. *Post-test* Data Normality Test**

**Test of Normality**

| Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|
| Statistic | Df | Sig. | Statistic | df | Sig. |
| .112 | 53 | .096 | .941 | 53 | .012 |

The Kolmogorov Smirnov table above shows that the significance value of the postthe experimental and control class test was 0.096 which indicates ≥ 0.05. So that it can it was concluded that the post-test data was normally distributed.

2) Homogeneity Test

The homogeneity test is used to determine whether the post-test data for the two classes are original from a population with the same variance or not. Homogeneity testing uses a test levene with the help of the SPSS version 23 application. The following are the results of the second post-test data homogeneity t class:

**Table 11. *Post-test* Data Homogeneity test**

**Test of Homogeneity of Variance**

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| Hasil | Based on Mean | .547 | 1 | 51 | .463 |
| | Based on Median | .374 | 1 | 51 | .544 |
| | Based on Median and with adjusted df | .374 | 1 | 49.631 | .544 |
| | Based on trimmed mean | .492 | 1 | 51 | .486 |

Based on the results of the Levene test in the table above, it shows the significance calculation amounting to 0.463 > 0.05, it can be concluded that the results of the experimental class post-test data and control is homogeneous.

3) T-test

In the t-test the researcher uses two hypotheses, namely: H0 : $\mu 1 = \mu 2$: There is no difference in the average value between the control class and the experimental class H1 : $\mu\ 1 \neq \mu\ 2$ : There is a difference in the average value between the control class and the experimental class. T-test decision making criteria, namely if the significance value (2-tailed) > 0.05 then H 0 accepted and H1 rejected. The following are the test results on the pre-test data for both classes:

**Tabel 12. T-test Result *Post-test Data***

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Result | Equal variances assumed | .547 | .463 | -3.923 | 51 | .000 | -13.4202 | 3.4207 | -20.2875 | -6.5530 |

In the table above, it shows the acquisition of a significance value of 0.000. This matter shows that the significance value obtained is less than 0.05 then H 1 accepted and H0 rejected. Thus, we can conclude that there are significant differences between post-test scores for the experimental class and control class, can be said to be comprehension ability the mathematics of students in both classes is different. So it can be said that the learning model STAD type cooperative with the ARIAS approach has an effect on improvement mathematical understanding ability of class VIII students. In this research, the STAD type cooperative learning model with the approach ARIAS has an effect on increasing mathematical understanding abilities. So that its application can be one way for teachers to improve their abilities students' mathematical understanding. This is supported by research conducted by Achmad Syahroni in 2018 with the title "Improving Student Activities and Learning Outcomes by using the ARIAS learning model with a jigsaw type cooperative model setting in Class XII IPS-3 MAN 2 Hulu Sungai Selatan. The results of this research are: increase in cognitive learning outcomes from an average learning outcome score of 60.06 by category low in cycle I to 83.68 in cycle II (Syahroni, 2018). In other research that conducted by Sari Fauziyah Simatupang and friends entitled "The Influence of Models Learning Assurance, Relevance, Interest, Assessment, Satisfaction and Model Co-op-Co-op Type Cooperative Learning on Concept Understanding and Ability Students' Mathematical Problem Solving Ability in Class XI MA Student Matrix Material Al-Wasliyah 12 Perbaungan Q.A 2020/2021". This research shows that there is an influence ARIAS and Co-op-Co-op learning models on the ability to understand concepts and problem solving with f count (4.525) > f table (3.23) (Simatupang et al., 2022). Then research by SAM Hetina, N. Parwati, I WP Astawa in 2018 entitled "Improving Learning Activities and Understanding of Mathematics Concepts for Middle School Students through the Application of Models ARIAS Learning". The results of this research indicate that the application of the model ARIAS learning increases learning activities and understanding of mathematical concepts Class IV students at SD N 2 Campang Raya Bandar Lampung TP. 2016/2017" (Hertina et al., 2018).

## D. Conclusion

Application of the STAD type cooperative learning model with the ARIAS approach conducted by researchers on class VIII students at MTs Ma'arif Nu 1 Sokaraja was carried out

very well Good. This is proven by the average value obtained from observations by two people observers during 2 meetings was 3.68 which indicates the application of learning it's been done very well. Application of the STAD type cooperative learning model The ARIAS approach has an effect on increasing understanding abilities mathematics class VIII students at MTs Ma'arif NU 1 Sokaraja. This can be seen from the results of data analysis post-test using the t-test with an independent sample test of 0.000 < 0.05, meaning $H_0$ rejected and H1accepted. $H_1$ accepted indicates there is a difference in understanding ability students' mathematics between experimental classes and control classes. These differences can also be seen in the statistical data of the average value of the experimental class and control class. Class average score experiment, namely 75.6, higher than the control class mean value, namely 62.2, with a difference significant of 13.4.

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