



## The Effect of Cooperative Learning Model Type of Team Assisted Individualization Assisted LKPD on Mathematics Learning outcomes

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### Abstract

Tujuan penelitian adalah untuk mengetahui hasil belajar matematika peserta didik dengan menggunakan model pembelajaran cooperative learning tipe team assisted individualization berbantu LKPD berbasis hots; dan pengaruh model pembelajaran cooperative learning tipe team assisted individualization berbantu LKPD berbasis hots terhadap hasil belajar matematika peserta didik. Metode yang digunakan adalah eksperimen dengan pengambilan sampel ditentukan dengan mengambil kelas yang tersedia tanpa melakukan random sampling. Kelas eksperimen dan kelas kontrol ditentukan dengan cara pengundian, hasil dari pengundian menetapkan kelas V SD Mallengkeri I sebagai kelas kontrol dan kelas V SD Mallengkeri II sebagai kelas eksperimen yaitu kelas yang diberikan perlakuan (treatment). Teknik analisis data dalam penelitian ini menggunakan analisis statistik deskriptif. Sebagai persyaratan dilakukan uji persyaratan yaitu uji normalitas dan uji homogenitas dengan menggunakan Kolmogorov-Smirnov dan Levene's test. Setelah itu dilakukan uji hipotesis dengan menggunakan uji Paired sampel test. Hasil penelitian menunjukkan bahwa mean kelas eksperimen yaitu 81, 88 sedangkan mean kelas kontrol 68, 88. Berdasarkan analisis data dengan uji Paired sampel test. yang dilakukan pada taraf kepercayaan 95% diperoleh hasil  $0,000 < 0,05$  yang berarti  $H_0$  ditolak. Untuk mengetahui perbedaan hasil belajar dan pemahaman siswa antara kelas eksperimen dan kelas kontrol maka dilakukan uji N-gain menggunakan rumus N-Gain. Berdasarkan hasil perhitungan diperoleh hasil, untuk kelas eksperimen sebesar 0, 58 yang menunjukkan peningkatan pemahaman dengan kategori sedang. Berdasarkan data tersebut dapat disimpulkan bahwa penggunaan model pembelajaran Team Assisted Individualization berpengaruh terhadap hasil belajar siswa kelas V SD Gugus III Tamalate Makassar.

**Kata Kunci:** Model Pembelajaran Team Assisted Individualization, hasil belajar siswa

### Abstract

The purpose of the study was to determine the students' mathematics learning outcomes by using a cooperative learning model of team assisted individualization type assisted by hots-based worksheets; and the effect of cooperative learning model type team assisted individualization assisted LKPD based hots on students' mathematics learning outcomes. The method used is an experiment with sampling determined by taking the available classes without doing random sampling. The experimental class and control class were determined by lottery, the results of the draw determined that class V SD Mallengkeri I was the control class and class V was SD Mallengkeri II as the experimental class, namely the class that was given treatment. The data analysis technique in this study used descriptive statistical analysis. As a requirement, test requirements were carried out, namely normality test and homogeneity test using Kolmogorov-Smirnov and Levene's test. After that, the hypothesis is tested using the Paired sample test. The results showed that the mean of the experimental class was 81, 88 while the mean of the control class was 68, 88. Based on data analysis with the Paired sample test. which was carried out at the 95% confidence level, the results were  $0.000 < 0.05$ , which means  $H_0$  is rejected. To find out the difference in student learning outcomes and understanding between the experimental class and the control class, the N-gain test was carried out using the N-Gain formula. Based on the calculation results obtained, for the experimental class of 0.58 which shows an increase in understanding in the medium category. Based on these data, it can be concluded that the use of the Team Assisted Individualization learning model has an effect on the learning outcomes of fifth graders at SD Cluster III Tamalate Makassar.

**Keywords:** Team Assisted Individualization Learning Model, student learning outcomes

## **Introduction**

Permendikbud Number 37 of 2018 concerning Amendments to Permendikbud Number 24 of 2016 concerning Core Competencies and Basic Competencies of Lessons in the 2013 Curriculum in Primary and Secondary Education. that mathematics is a universal science and can be used as a basis for the development of modern technology, and plays an important role in various disciplines and advances the power of human thought.

Mathematics is a science that discusses numbers and their calculations, discusses numerical problems, regarding quantity and magnitude, studies the relationship of patterns, shapes and structures, means of thinking, collections of systems, structures and tools (Ismail, 2014). This means that the object discussed in mathematics is only a problem of numbers, both in the problem of numbers that have value and as a means of solving a problem.

Seen in the field that is happening today, mathematics is one of the subjects that students do not like. Based on the information provided by the fifth grade teacher that in learning Mathematics that there is an obstacle in learning mathematics is the lack of understanding of students in mastering the material being taught. Students have not mastered the prerequisite material so that it prevents students from mastering the material being taught. Students also find it difficult to solve problems that require understanding such as story questions or questions that are given different variations. The difficulty of these students can be observed from the attitude of students who are not independent in completing. Students continue to ask how to solve and the formula used. Even some students when faced with the problem become lazy and don't really mean to find a solution.

The facts that occur in the field are in accordance with the observation that the fifth grade elementary school students in cluster III Tamalate Makassar in achieving Competency Standards (SK) and Basic Competence (KD), in Mathematics subjects with scores that are still classified as very low are below the number 75 while the provisions the minimum completeness criteria (KKM) is 75, all can be seen from the daily test scores in the previous lesson. So that with these data, it is still classified as very low attainment of KD in Class V Elementary School Students in cluster III Tamalate, the learning outcomes can be caused from various aspects.

Mathematics lessons in general are lessons that must be understood, not just memorized. The lack of students' abilities needs to be immediately found a solution. In the process of learning mathematics the teacher must use learning media that are around the student's environment, and to make it easier for students

to understand the mathematics material presented by the teacher, it is also necessary to use learning media such as Student Worksheets (LKPD) based on Hots, how to This is an alternative to improve student learning outcomes. Hots-based LKPD presentation can be developed with various innovations. The things that are developed in the hots-based LKPD are the properties of the cube space which are explained in stages so that it is easier for students to understand them.

### **1. Understanding the Cooperative Learning Model Type Team Assisted Individualization (TAI)**

(Suyitno, 2006) argues that the type of Team Assisted Individualization (TAI) cooperative learning is a learning model in the form of small heterogeneous groups with different backgrounds in thinking to help each other with other students who need help. Meanwhile, according to (Slavin, 2008) states that TAI is a learning model that combines the advantages of cooperative learning with individual teaching.

### **2. Steps of the Team Assisted Individualization (TAI) Cooperative Learning Model**

Referring to the eight components of Team Assisted Individualization (TAI) proposed by (Slavin, 2013), the steps in the TAI type of cooperative learning model used in this study include:

- a). Prepare teaching materials that will be studied by groups of students.
- b). Give a placement test (pre-test) to students or see the daily average value of students, so that the teacher knows the ability of students as a reference for group division.
- c). Students pay attention to a brief explanation of the material delivered by the teacher.
- d). Students are formed into small heterogeneous groups based on their abilities, each group consists of 4-5 groups.
- e). Each group does a task from the teacher in the form of a Learning Student Worksheet (LKPD) that has been previously designed for discussion. In this step, students who have difficulty understanding the material can ask their group friends. If needed the teacher will provide assistance individually.
- f). The leader or representative of the group reports the success of his group by presenting the results of his work.
- g). Students do the post-test individually.
- h). Determine the best group and give rewards for the results achieved by the best group.
- i). Students and teachers discuss the material and conclude the material together.

### **3. Strengths and Weaknesses of TAI-Type Learning**

The description of the Team Assisted Individualization (TAI) type of Cooperative Learning can be seen in the advantages of Team Assisted Individualization (TAI) (Slavin, 2013).

- 1) More emphasis on group cooperation in mastering the material.
- 2) Motivating students to help each other group members.
- 3) Members of heterogeneous groups, so that students who have mastered the material well can help other students in groups whose mastery of the material is weak.
- 4) Each group learns the same material to make it easier for the teacher to handle it.
- 5) This program is very simple so that it is easy to learn and do by teachers and students.
- 6) Can minimize teacher involvement in routine inspections and management.

The weaknesses of Team Assisted Individualization (TAI) are:

- 1) It takes more time than the lecture method.
- 2) Students in one group study the same part of the material so that it is possible that there are students who do not study it and only depend on their friends in the group.

#### 4. Definition of Student Worksheet (LKPD)

(Marsa, Hala, Y., and Taiyeb, 2016) in the article stated that LKPD is a student guide used to carry out investigation or problem solving activities. Meanwhile, according to (Trianto, 2009) LKPD is a printed teaching material in the form of sheets containing assignments which contain instructions and steps to complete assignments. (Andi Prastowo, 2012) defines LKPD as a printed teaching material in the form of sheets of paper containing material, summaries, and instructions for implementing learning tasks that must be done by students with reference to the Basic Competencies that must be achieved. The theory above can be explained that the Student Worksheet (LKPD) is very important in every learning process, especially learning mathematics. And based on the definition of the LKPD above, it can be concluded that the Student Worksheet (LKPD) is a sheet that contains tasks that must be done by students in the learning process, contains instructions or steps in completing tasks in accordance with Basic Competencies and indicators of achievement of learning outcomes. to be achieved. Therefore, there are so many benefits from using LKPD because it is a means or tool to facilitate teaching and learning activities so that effective interaction is formed between students and educators, the aim is to increase student learning activities and achievements.

#### 5. Understanding Learning Outcomes

The term learning according to (Usman, 2016) is a change in behavior in individuals due to interactions between individuals and other individuals and individuals with their environment so that they are better able to interact with their environment. While learning according to (Winkel, 2016) is a mental activity that takes place in an active interaction between a person and

the environment, and produces changes in knowledge, understanding, skills and attitude values that are relatively constant and traceable (Susanto, 2013).

Learning outcomes can be defined as a process of changing behavior in students, which can be observed and measured in the form of changes in knowledge, attitudes and skills. These changes can be interpreted as an increase and development that is better than before (Hamalik, 2015). According to the Big Indonesian Dictionary (KBBI) learning outcomes are mastery of knowledge or skills developed through subjects, usually aimed at test scores or grades given by the teacher (Language, 2008). Based on the above understanding, it can be interpreted that the assessment given by educators or teachers to students can be in the form of tests or non-tests.

#### 6. Mathematics Learning

The term mathematics comes from the Latin word *mathematica* which was originally taken from the Greek word *mathematike*, which means 'relating to learning'. The word has the root word *mathema* which means knowledge or knowledge. The word Mathematics is very closely related to another word, namely *mathein* which means learning or thinking (Suherman, 2014). According to (Suherman, 2014) mathematics is a science that is obtained by reasoning. This does not mean that other sciences are not obtained through reasoning, but in mathematics it emphasizes activities in the world of ratios (reasoning), while in other sciences it emphasizes the results of observations or experiments in addition to reasoning.

Furthermore, Johnson and Rising (Suherman, 2014), stated that mathematics is a pattern of thinking, organizing patterns, logical proofs, mathematics is a language that uses carefully defined, clear, and accurate terms, its representation with symbols and dense, more in the form of symbolic language. about ideas than about sounds. Hans Freudental (Marsigit, 2016) says that mathematics is a human activity and must be associated with reality. Thus, mathematics is a logical way of thinking that is presented in numbers, spaces, and forms with existing rules that cannot be separated from these human activities. In essence, mathematics cannot be separated from everyday life, in the sense that mathematics has practical uses in everyday life. All the problems of life that require careful and thorough solving must inevitably turn to mathematics.

#### Method

This study compares learning the type of Team Accelerated Instruction assisted by LKPD with conventional learning in the field of Mathematics study for class V group 3 Tamalate Makassar. The existence of treatment (treatment), then this research is classified into experimental research, (Sugiyono, 2015). Researchers

use experiments because they want to manipulate variables by giving treatment by comparing 2 classes in each school. Research location This research was conducted at SD Cluster 3 Tamalate Makassar.

### 1. Population

Quantitative research needs to determine a number of populations as research objects that will become data sources. The population is an object or subject that is in an area and meets certain requirements related to research problems (Abdullah, 2014). In line with this opinion, "In quantitative research, population is defined as a generalization area consisting of: objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions (Sugiyono, 2015).

The population in this study were all fifth grade students of the Tamalate Cluster 3 Elementary School in the 2021/2022 academic year with a total of 5 schools. It is assumed that the population in this study is homogeneous due to the selection of schools from the 3 Tamalate cluster.

### 2. Sample

A portion of the amount owned by the population is usually called the sample. The sample is part of the population itself (Sugiyono, 2015). While the sample is part of the population that has certain characteristics or conditions to be studied. Because not all data and information will be processed and not all people or objects will be studied, but it is enough to use a representative sample (Abdullah, 2014). So it can be concluded that the sample is the number or characteristic that represents the population under study.

The sample selection in this study was carried out by taking samples from 5 schools as a population and the sample from that population was elementary school. Inpres Mallengkeri I and SD. Mallengkeri II because both schools are core schools in Cluster 3 with each number of students from elementary school. Mallengkeri I as many as 51 people and elementary school. Mallengkeri II as many as 549 people.

The sampling technique used is Cluster sampling (Ara Sampling). Regional sampling technique is used to determine the sample if the object to be studied or the data source is extensive, then the sampling is based on a predetermined population area (Sugiyono, 2014). Research Variables are characteristics or conditions on an object that has a variety of values. In general, it can be stated that the variable is the operationalization of the concept. Variable functions can be divided into three functions, namely cause variables, connecting variables, and effect variables (Gempur Santoso, 2005). The data that has been collected will be processed and analyzed using two types of analysis, namely descriptive statistical data analysis and inferential statistical data analysis.

Prerequisite test for normality test Before analyzing the hypothesis testing, it is necessary to first know whether the data has met the requirements for using statistics to be used in hypothesis testing. Homogeneity test was conducted to determine whether the two groups of data obtained had the same variance or were homogeneous. The homogeneity test was obtained from the pretest and posttest scores in the experimental class and the control class. Testing the research hypothesis using the Statistical Package for Social Science (SPSS) version 21 program is the Paired sample test. By paying attention to the hypotheses that have been made previously.

## Result and Discussion

Learning outcomes of students' mathematics by using cooperative learning model type team assisted individualization assisted LKPD based on hots. Based on the test results of the test instrument, about student learning outcomes in mathematics learning which amounted to 14 questions and then distributed to respondents as many as 25 students in different schools. The pretest was carried out to determine the students' initial abilities before being given treatment by the researcher. The pretest was carried out in the two classes that will be used as research, namely, class V SDN Mallengkeri I and class V SDN Mallengkeri II. The results of the pretest for class V SDN Mallengkeri I obtained an average value of 58.6 while for class V SDN Mallengkeri II an average value of 58.9 was obtained.

After the research data is obtained, the next step is to perform a normality test and homogeneity test. The test is carried out to determine whether the data comes from normal distribution data or not, and has a homogeneous variance or not.

Table 1 data normality test

		Unstan dardize d Residu al
N		25
Normal	Mean	,00000
Parameters(a,b)		00
	Std.	8,4207
	Deviation	6235
Most Extreme	Absolute	,166
Differences		
	Positive	,166
	Negative	-,105
Kolmogorov-Smirnov Z		,831
Asymp. Sig. (2-tailed)		,494

The normality test used the Kolmogorov-Smirnov test method which obtained the Std. Deviation result of 8.420762. Meanwhile, the value of Kolmogorov-Smirnov Z is 0.831 and the value of Sig. (2 tailed) is 0.494, meaning that the value of Sig. (2 tailed) is  $< 0.05$ , so that according to the basis for decision making in the normality test, it can be concluded that the data is normally distributed.

After the normality test has been carried out, the next step is to perform a homogeneity test using the Levene's test.

Table 2 Data Homogeneity Test

	Levene Statistic	df1	df2	Sig.
hasil belajar siswa Based on Mean	,684	1	48	,412
Based on Median	,237	1	48	,628
Based on Median and with adjusted df	,237	1	42,112	,629
Based on trimmed mean	,684	1	48	,412

The result of the homogeneity test between two different classes is a significance value of 0.412, which means that the significance value is greater than 0.05 which indicates that the two groups are homogeneous. The selection of the experimental class and control class is done by looking at the average value, the lower average value is used as the experimental class and for the higher average value it is used as the control class, thus placing class V SDN Mallengkeri II as the control class and the control class. V SDN Mallengkeri I as an experimental class.

The treatment was carried out in the experimental class for 2 meetings. The treatment was carried out using a Team Accelerated Instruction type learning model assisted by HOST-based LKPD. This learning model can create students who have the ability to develop their potential. Therefore, the Team assisted Individualization learning model is used because this model combines individual learning with group learning. In addition, this model also pays attention to differences in students' prior knowledge to achieve learning achievement. This is in line with the reason (Slavin, 2008) developed the Team assisted Individualization learning model in his work Cooperative Learning: Theory, Research and Practice, which explains that the rationale behind individualizing

learning is that students enter the classroom with very good knowledge, abilities and motivation. diverse. When the teacher conveys a lesson to various groups, it is likely that there are some groups who do not have the ability to learn the lesson.

When learning using the Team Assisted Individualization model with the help of HOTS-based LKPD, students are easier to understand the material because the student learning process emphasizes direct learning and group learning. Cooperative learning is a teaching and learning activity in groups (Elaine B Johnson, 2009), Cooperative learning is a learning system that provides opportunities for students to work together with fellow students in structured tasks (Anita Lie, 2010). So that children will be more active in learning because they can exchange ideas with each other and also give each other opinions that make them have additional knowledge from these peer tutors.

The effect of cooperative learning model type team assisted individualization assisted by hots based worksheets on mathematics learning outcomes for fifth grade elementary school students in Tamalate group III Makassar.

Table 3 hypothesis testing

		Paired Differences							
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	eksperimen pre-eksperimen post	-23,400	5,560	1,112	-25,695	-21,105	-21,042	24	,000
Pair 2	kontrol pre- kontrol post	-11,080	5,041	1,008	-13,161	-8,999	-10,990	24	,000

Furthermore, from the results of calculating the hypothesis by using the Paired sample test test. The results of the hypothesis test indicate that there is an influence on the use of the HOTS-based Team Assisted Individualization learning model on student learning outcomes in mathematics. This can be seen from the results of the hypothesis test that the value of sig. (2 tailed) is  $0.000 < 0.05$ , which means  $H_0$  is rejected.

After testing the hypothesis, the next step is the N-Gain test to see the improvement in student learning outcomes. The N-Gain results obtained by the experimental class are 0.58 in the medium category, while for the control class the results are 0.27 in the low category. Broadly speaking, it can be concluded that there is an influence of the HOTS-based Team Assisted Individualization learning model on student learning outcomes. This is evidenced by the results of hypothesis testing and N

-Gain testing and also seen from the high average increase in the experimental class that did not occur in the control class, thus proving that the use of the Team Assisted Individualization learning model with the help of HOTS-based worksheets can help and have an effect in improving results. better student learning.

### Simpulan (5%)

Based on the results of the research and discussion that have been presented in the previous chapter, it can be concluded that the Team Assisted Individualization learning model assisted by HOTS-based LKPD has a significant influence on the mathematics learning outcomes of fifth grade students in Tamalate Makassar. This can be seen from the average posttest result of the experimental class which is greater than the average result of the control class. From these results, both have a difference in average values, namely, for the experimental class, the average pretest value was 58.6 and increased with an average posttest score of 81.7. Then for the control class, the average pretest score was 58.9, then it increased with an average posttest score of 70.0.

The results of students' mathematics learning using the cooperative learning model of team assisted individualization assisted by LKPD based on HOTS, can also be seen in the results of the calculation of the hypothesis test that the value of  $t_{count} > t_{table}$  or  $0.000 < 0.05$ , which means that  $H_0$  is rejected. Likewise, based on the results of the N-Gain test calculation for the experimental class and the control class. The results have different differences.

The effect of the cooperative learning model type team assisted individualization assisted by LKPD based on HOTS on the mathematics learning outcomes of fifth grade elementary school students Tamalate group III Makassar, for the experimental class obtained an average N-gain of 0.6 which indicates that the increase in understanding in the medium category, and the average gain of N-gain in the control group is 0.2692 which indicates that the increase in understanding is in the low category.

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