Effectiveness of STAD Cooperative Learning Model with LKS Help on Mathematical Learning Outcomes of Class VIII Students

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Abstract

The learning outcomes of mathematics are one of the benchmarks of the high and low quality of a mathematics learning process. This study aims to find out how the effectiveness of STAD type cooperative learning model with the help of worksheets on mathematics learning outcomes of class VIII students at MTs. Muhammadiyah Palleko in Takalar in 2014/2015 academic year. This research is quasi-experimental or quasi-experimental research. The instrument used in this study is the essay type learning test with a sample of 35 people, and the sampling technique used is saturated samples. The data analysis technique used is descriptive statistical analysis and inferential statistical analysis. Based on the results of descriptive analysis obtained the average of the two groups, namely the experimental class before treatment (pre-test) of 59.16 and after the surgery of (posttest) 75.61, the average pre-test control class was 54.56, and the post-test average is 58.25. Whereas based on the results of relative efficiency and inferential analysis it can be concluded that the STAD type of cooperative learning model with the help of LKS is effective in improving the mathematics learning outcomes of the eighth-grade students of MTs. Muhammadiyah Palleko District of Taylar.

Keywords: Cooperative Type STAD Model, Student Worksheet, Mathematics Learning Outcomes*.

A. Introduction

Education is a relationship between personal educators and students. In association, there is contact or communication between each person. This relationship if increased to the level of educational relations, it becomes a relationship between the personal educator and the personal of the student, which in turn gives birth to the responsibility of education and the authority of knowledge. Educators act in the interests and safety of students, and students recognize the power of educators and depend on them (Hasbullah, 2001: 5)

Cooperative learning or in groups can develop collective behavior and better relationships between students and can improve students' academic abilities. In cooperative learning, students can learn more from their friends than teachers because the interactions that occur in

cooperative learning can spur the formation of new ideas and enrich students' intellectual development (Trianto, 2010: 62)

Based on the results of research conducted by Eralita, et al (2012) with the title of the study "the effectiveness of cooperative learning models of student teams achievement divisions (STAD) and team assisted individualization (TAI) methods equipped with student worksheets on student learning achievement and motivation in the eighth grade colloquial subjects of SMAN Kebakkramat ", said that the use of the STAD method which is equipped with LKS is more effective in improving student achievement and learning motivation compared to the TAI method which is fitted with LKS.

Based on the results of the research above, the researcher tried to research with the title of the effectiveness of STAD type cooperative learning model with the help of LKS on the mathematics learning outcomes of VIII graders at Takalar District MTs. Muhammadiyah Palleko, with the aim of knowing how the effectiveness of STAD type learning model with the help of LKS towards the mathematics learning outcomes of eighth-grade students.

B. Literature Review
Mathematics Learning Outcomes
Anita (2009, in Kasliyanto, 2014: 16) suggests that learning outcomes are a change in behavior or acquisition of new practices from students who are permanent, functional, confident and aware. In line with that, Mulyasa (2006, in Kasliyanto, 2014: 16) suggests that learning outcomes are student learning outcomes as a whole, which becomes an indicator and degree of behavior change in question.

Based on the description above, it can be concluded that learning outcomes are the results achieved by students after doing mathematics learning activities and obtained through a given test then used as a measure to determine students' ability to master the material.

Cooperative Learning Model Type Stad
STAD type cooperative learning model is one type of collaborative learning model using small groups with the number of members of each group of 4-5 students who are heterogeneous (Trianto, 2010: 68).

According to Nuristan in his book Rusman (2013), stated that the STAD type cooperative learning activity consists of six stages:

a. Submission of Purpose and Motivation.

Convey the learning objectives to be achieved in the learning and motivate students to learn.

b.   Group Distribution.

Students are divided into several groups, where each group consists of 4-5 students who prioritize class heterogeneity (diversity) in academic achievement, gender / gender, ethnic sense.

c.   Presentation from Teacher

The teacher conveys the subject matter by first explaining the lesson objectives to be achieved at the meeting as well as the importance of the subject matter learned. The teacher motivates students to be able to learn actively and creatively. In the learning process, the teacher is assisted by media, demonstrations, questions or real problems that occur in everyday life. Also explained about the skills and abilities that students are expected to master, tasks and work that must be done and ways to do it.

d. Learning Activities in Teams (Team Work)

Students learn in groups that have been formed. The teacher prepares a worksheet as a guide for group work so that all members master and each contributes. As long as the team works, the teacher makes observations, provides guidance, encouragement, and assistance when needed. Teamwork is the most critical feature of STAD.

e. Quiz (Evaluation).

The teacher evaluates learning outcomes through quizzes about the material being studied and also values the presence of the work of each group. Students are given examination individually and are not allowed to work together. This is done to ensure that students individually are responsible for themselves in understanding the teaching material.

f.   Team Achievement Award.

After the quiz, the teacher checks the students' work and is given a number with a range of 0 - 100. The teacher can do the next award for the group's success by performing the following stages. Namely: (1) Calculating individual scores. (2) Calculate group scores. (3) Giving gifts and recognition of group scores (Rusman, 2013: 215-216).

Student worksheet
Student worksheets are instructional tools that consist of a series of questions and information designed to guide students to understand complex ideas because they work through systematically (Ufuk, Akdeniz, Cimer, and Gurbuz, 2013: 174).

Andriani in his book Prastowo (2014) revealed that, at least there are four critical points that are the objectives of the preparation of LKS, namely: (1) presenting teaching materials that facilitate students to interact with the content provided, (2) presenting tasks that increase mastery students towards the material submitted, (3) train student learning independence, (4) facilitate educators in giving assignments to students. Based on the understanding of the LKS, it can be guessed what its functions are in learning activities. But more clearly the following will be revealed that LKS has four features, namely: (1) LKS as a teaching material that can minimize the role of educators but rather activate students. (2) LKS as teaching material that makes it easier for students to understand the content provided. (3) LKS as a teaching material that is concise and rich in tasks to practice. (4) LKS facilitates the implementation of teaching to students.

C. Methodology
The type of research used in this study is quasi-experimental research (Quasi-Experimental). Quasi-experimental design is somewhat better than pre-experimental design because it does a way to compare groups (Emzir, 2014: 102).

The research design used is Non-equivalent Control Group Design. This design is almost the same as the pretest-posttest control group design, only in this design, the experimental group and the control group were not chosen randomly, then given a pretest to determine the initial state of the difference between the experimental group and the control group. The experimental group is the group taught with the STAD type cooperative learning model with the help of LKS, and the control group is the group taught with the STAD type cooperative learning model without the help of LKS.

$$
\begin{array}{ccc}
O_1 & X & O_2 \\
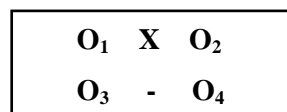O_3 & - & O_4
\end{array}
$$

Figure 3.1: Non-equivalent Control Group Design.

Information:
X   = Treatment with learning the STAD type cooperative model with the help of LKS
 -   = without treatment
O1 = Results of the experimental class pre-test
O2 = Results of the post-test experimental class
O3 = The results of the control class pre-test
O4 = The results of the post-test control class

The population in this study were all eighth-grade students of MTs. Muhammadiyah Palleko 2014-2015 school year consisting of two courses totaling 35 people, while the sample in this study were all eighth-grade students of MTs. Muhammadiyah Palleko 2014-2015 school year includes two classes, namely class VIII.1 composed of 19 students and class VIII.2 consisting of 16 students.

Based on the description above, it can be seen that the sample of this study were all eighth-grade students of MTs. Muhammadiyah Palleko is also a population of this study, so the example of this study is included in Saturated Sampling. Saturated sampling is a sample determination technique if all members of the study population are also as research samples. The instrument used in this study is an essay type test results of 5 items. Data retrieval techniques of students' mathematics learning outcomes use test results of learning before and after treatment. Data analysis techniques used in this study are two, descriptive and inferential data analysis techniques.

D. Findings and Discussion
1. Findings
scription of Students' Mathematics Learning Outcomes of Class VIII MTs Muhammadiyah Palleko District of Taylor Using STAD Cooperative Learning Model with LKS Assistance
Data on the experimental class learning outcomes of mathematics can be summarized in the following table.

Table 4.4: Value of Descriptive Statistics Results of Pre-Test and Post-Test on Experimental Classes

Statistical Value	Statistical Value	
	Pre-Test	Post-Test
Sample	18	18
Lowest Value	46	65
The highest score	73	85
Mean value ($\bar{x}$)	59.16	75.61
Standard Deviation	6.08	6.71

Based on the table above it can be seen that:

- Pre-Test Experiment Group

The highest score obtained before treatment in the experimental class was 73, while the lowest score was 46, with an average rating of 59.16.

- Post-Test Experiment Group

The highest score obtained after treatment in the experimental class was 85, while the lowest score was 65, with an average score of 75.61.

Based on the results of the pre-test and post-test in the experimental group obtained the average value of mathematics learning outcomes significantly increased after the treatment, namely the average value of the pre-test was 59.16, while the average cost of the post-test was 75, 61. with a difference of 16.45.

If the learning outcomes of students are grouped in the categories of deficient, low, medium, high, very high frequencies and percentages will be obtained after the pre-test and post-test which are included in the group categories as follows:

Table 4.5: Categorization Table Pre-test experimental class

Learning Results	Categories	Pre-test experimental group	
		Frequency	Percentage (%)
$0 \leq x < 20$	Very low	0	0
$20 \leq x < 40$	Low	0	0
$40 \leq x < 60$	Medium	11	61,11
$60 \leq x < 80$	High	7	38,89
$80 \leq x \leq 100$	Very high	0	0
Total		18	100

Table 4.6: Categorization Table of Post-test experimental class

Learning Results	Categories	Pre-test experimental group	
		Frequency	Percentage (%)
$0 \leq x < 20$	Very low	0	0
$20 \leq x < 40$	Low	0	0
$40 \leq x < 60$	Medium	0	0
$60 \leq x < 80$	High	14	77,78
$80 \leq x \leq 100$	Very high	4	22,22
Total		18	100

Description of Mathematics Learning Outcomes of Grade VIII Students of MTs Muhammadiyah Palleko District of Takalar who do not Use STAD Cooperative Learning Models with LKS Assistance

Data from the control class mathematics learning outcomes can be summarized in the following table.

Table 4.11: Value of Descriptive Statistics of Pre-Test and Post-Test Results in Control Classes

Statistical Value	Statistical Value	
	Pre-Test	Post-Test
Sample	16	16
Lowest Value	43	48
The highest score	65	75
Mean value	54,56	58,25
Standard Deviation	7.87	6.82

Based on the table above it can be seen that:

a) Pre-Test Control Group

The highest score obtained before treatment in the control class was 65, while the lowest score was 43, with an average rating of 54.56.

b) Control Group Post-Test

The highest score obtained after therapy in the control class is 75, while the lowest score is 48, with an average rating of 58.25.

Based on the results of the pre-test and post-test in the control group obtained the average value of mathematics learning outcomes increased but not significant after the treatment, namely the average value of the pre-test was 54.56, while the average cost of the post-test was 58.25, with a difference of 3.69.

If the learning outcomes of students were grouped in the categories of deficient, low, medium, high, very high frequencies and percentages will be obtained after the pre-test and post-test which are included in the group categories as follows:

Table 4.12: Control class categorization pre-test table

Learning Results	Categories	Pre-test experimental group	
		Frequency	Percentage (%)
$0 \leq x < 20$	Very low	0	0
$20 \leq x < 40$	Low	0	0
$40 \leq x < 60$	Medium	13	81,25
$60 \leq x < 80$	High	3	18,75
$80 \leq x \leq 100$	Very high	0	0
Total		18	100

Tabel 4.13: Tabel Kategorisasi Post-test kelas kontrol

Learning Results	Categories	Pre-test experimental group	
		Frequency	Frequency
$0 \leq x < 20$	Very low	0	0
$20 \leq x < 40$	Low	0	0
$40 \leq x < 60$	Medium	12	75
$60 \leq x < 80$	High	4	25
$80 \leq x \leq 100$	Very high	0	0
Total		16	100

Comparison Results in Math Grade VIII MTs.Muhammadiyah Palleko Kab.Takalar Using STAD Cooperative Learning Model with LKS assistance and who do not use the STAD Cooperative Learning Model to Help LKS

Based on previous calculations in mind that the average mathematics learning outcomes in the experimental class taught using cooperative learning model type STAD with the help of LKS is 59.16 to 75.61 pre-test and post-test for. While the average result of learning mathematics in control classes was not taught by using cooperative learning model type STAD with the help of LKS is 54.56 to 58.25 pre-test and post-test for.
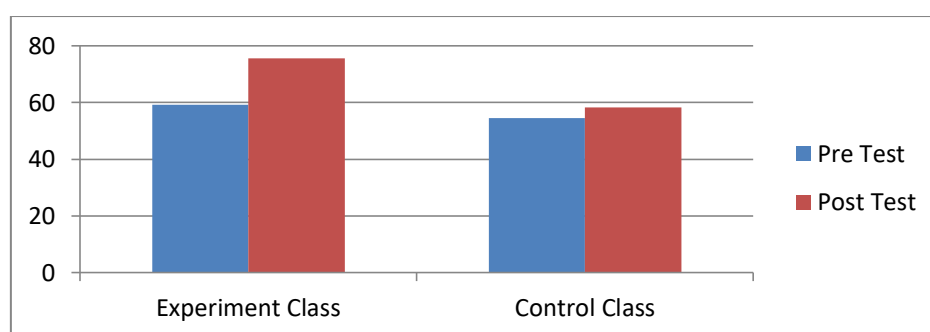

Figure 4.1: Comparison of Average Mathematics Learning Outcomes for Experimental Classes and Control Classes

The analysis used to test the hypothesis is the sign test (t test), before the t-test has been known the average experimental class $X_1 = 75.61$ and the average control class $X_2 = 58.25$. Variant Experiment Class Sample $S_1^2 = 45.02$, Control Class Variance $S_2^2 = 46.51$.

$$t_{count} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$$

$$= 7{,}48$$

Based on hypothesis testing using the t-test, the hypothesis proposed was the STAD type cooperative learning model with the help of LKS not effective in improving mathematics learning outcomes of the eighth-grade students of MTs. Muhammadiyah Palleko Takalar District.

Hypothesis testing criteria, namely:

- H0 was rejected if t count> t table.
- H0 was accepted if t count <t table.

Based on the data processing above, it can be seen that the count = 7.48 and t-table = 1.69. Because t-count> t-table (7.48> 1.69), it can be concluded that H0 was rejected..

2. Discussion

Based on the results of research carried out in the experimental class which was taught using the STAD type cooperative learning model with the help of LKS and control classes which were not explained by using STAD type cooperative learning model with the help of LKS in the eighth-grade students of MTs. Muhammadiyah Palleko District, Takalar, obtained the following results:

The lower average value of the effects of mathematics learning outcomes of students in the taught class who do not use STAD type cooperative learning model with the help of LKS because there is no tool or media that can help students in solving the problems given by the teacher.

Because only with examples of questions that have been written before are still lacking to support students' knowledge in solving problems. So that it affects student learning outcomes, where the mathematics learning outcomes of students taught by not using STAD type cooperative learning model with the help of LKS only have an average of 58.25, this value is included in the medium category. This is also reinforced by observation sheets which show that student learning activities are less active and less active.

Unlike the students who were taught using the STAD type cooperative learning model with the help of LKS, they gained an average of high mathematical problem fraction abilities. This is because in learning they have supporting tools or media namely LKS (Student Worksheets) which can help facilitate solving the problems given by the teacher. In the worksheets, there are also a few primary materials, examples of questions and practice questions that are useful to train students in working on issues that are almost the same as the test questions. So that it can affect student learning outcomes, where the learning outcomes of mathematics taught using STAD type cooperative learning model with the help of LKS have an average of 75.61, this value is included in the high category. This is also reinforced by observation sheets which show that student learning activities are quite active and quite active.

Both of the above statements are supported by the results of hypothesis testing using an independent sample t-test and relative efficiency test, which says that students who are taught using the STAD type cooperative learning model with the help of LKS are more effective than those who are not prepared using a type cooperative learning model STAD with the help of LKS in improving the mathematics learning outcomes of the eighth grade students of MTs. Muhammadiyah Palleko Takalar District.

Based on the literature review previously explained that cooperative learning emphasizes group goals and success, which can only be achieved if all group members can master the material. The purpose of collaborative learning is to maximize student learning to improve academic achievement and understanding both individually and in groups.

This is also in line with research conducted by Eralita, et al. (2012) with the title of the study "the effectiveness of cooperative learning models of student teams achievement divisions (STAD) and team assisted individualization (TAI) methods equipped with student worksheets on student learning achievement and motivation in colloidal subject matter. Class XI of SMAN Kebakkramat ", which said that the STAD type cooperative model that was equipped with LKS was more effective in improving learning achievement and motivation compared to the TAI model provided with LKS.

E. Conclusion

The average mathematics learning outcomes of the eighth-grade students of MTs. Muhammadiyah Palleko District of Taylor who did not use the STAD type cooperative learning model with the help of the LKS in the control class was 58.25, where the average results before the learning were 54.56. Thus, the percentage increase in the average learning outcomes reached 6.76%, the average mathematics learning outcomes of the eighth-grade students of MTs. Muhammadiyah Palleko District. Takalar who used STAD type learning model with the help of LKS in the experimental class was 75, 61, where the average results before the implementation of learning are 59.16. Thus, the percentage increase in the average learning outcomes is reaching 27.80%, and the use of STAD type cooperative learning model with the help of LKS is effective in improving the mathematics learning outcomes of students in the eighth grade of MTs. Muhammadiyah Palleko, Kabalar. This can be seen in the shared learning

outcomes in the control class = 58.25 and the experimental level = 75.61, so it can be seen clearly that there is an increase in the average learning outcomes of students in the class that uses the STAD type cooperative learning model with the help LKS. This can be strengthened by the results of relative efficiency and inferential statistical analysis (t-test), where t counts> t table (7.48> 1.69).

Recommendations, Referring to the results of this study, it is expected that educators or instructors who teach mathematics subjects can use the STAD type cooperative learning model with the help of LKS, to train student cooperation and also be able to exchange opinions with their group friends in solving math problems.

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