



The Effectiveness of the Contextual Learning Model Assisted by Hands On Student Learning Outcomes

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Abstract

This study aims to determine the effectiveness of the contextual learning model assisted by hands on problem solving in improving students' mathematics learning outcomes. The population in this study were all seventh grade students of SMP Negeri 1 Latambaga. Sampling in this study used cluster random sampling. Data collection techniques were carried out by giving tests in the form of description tests and non-tests. Data were analyzed using descriptive statistics and inferential statistics with hypothesis testing using independent t-test. The results of inferential research using the t-test have been obtained value $t_{count} = (14,698) > t_{table} = (1,670)$ or H₀ rejected. This shows that the contextual learning model assisted by hands on problem solving is effective in improving student learning outcomes.

Keywords: Effectiveness, Contextual Learning Model Assisted by Hands On Problem Solving. Learning outcomes

A. Introduction

Mathematics is one of the compulsory subjects contained in the curriculum from primary to secondary education. Even at the university level, mathematics courses are something that is included in almost all study programs because mathematics plays an important role in delivering human thinking to logical thinking, coupled with the era of globalization which requires the younger generation to continue to compete and improve self-competence, including improving abilities in mathematics, because Mathematics is important in human life and is needed as a tool in the development of technology and industry (Murtiyasa, 2016; Nanang, 2012).

However, in reality that happens in the field or at school. Mathematics learning that is applied so far is still abstract and ready to use. The teacher only provides concepts and applications so that students become passive and learning is meaningless (Nasryah & Rahman, 2018; Rida & Afriansyah, 2019). The learning method used is still conventional so that learning is centered on the teacher and students become passive making learning monotonous. The applied learning only trains students to memorize formulas, without explaining where the concept is obtained.

Such learning is not conducive so that students become passive and only accept concepts from the teacher when participating in the learning process in class. This has implications for effectively and efficiently preparing students to be able to use mathematics and mathematical thinking patterns in everyday life in studying various sciences or not. in accordance with the targets to be achieved in a learning process (Budiarti & Lestariningsih, 2018; Ruswana & Zamnah, 2018; Sundayana, 2012).

Contextual learning is a learning concept that helps teachers relate the material they teach to students' real world situations and encourages students to make connections between their knowledge and its application in their daily lives, involving the seven main components of contextual learning (Trianto, 2008).

Alternative learning models that are predicted to improve learning processes and outcomes, one of which is the application of a contextual learning model (Hartoyo, 2009) which is a learning model, a teacher can bring real-world situations into the classroom and encourage students to make connections between their knowledge and its application. so that students will be active and learning will not be monotonous anymore (Afrizal, 2013; Hasnawati, 2006; Kurniasih, 2020; Marsuni, 2016; Mas'eta et al., 2019; Perdana, 2020; Rahmawati, 2018; Rijal, 2015; Sepriady, 2018; Setiana, 2016). Hands On Problem Solving (HOPS) is a presentation of subject matter that exposes students to problems that must be solved or solved to achieve the objectives of learning mathematics. In learning mathematics, students are required to conduct authentic investigations to find solutions to the problems given. They analyze and identify problems, develop hypotheses, collect and analyze information and make conclusions as a result of the objectives of learning mathematics.

Based on the problems above, the research objective was formulated, namely to determine the effectiveness of the contextual learning model assisted by hands on problem solving on student learning outcomes.

B. Methodology

1. Research Design

Research Design This research is included in experimental research. The design used in this study is an experimental design with a posttest-only control design which is presented as follows:

$$\begin{array}{l} KE : R \quad X \quad O_1 \\ KK : R \quad \quad \quad O_2 \end{array}$$

(Sugiyono, 2014)

2. Instruments

The instruments used in this study were tests and non-tests. The test is used to collect data related to students' mathematics learning outcomes in the form of essay tests. The type of data in this study is quantitative data in the form of learning outcomes.

3. Technique of Data Analysis

Data analysis was carried out quantitatively by using descriptive analysis and inferential analysis. By using the t-test statistical test, namely the independent t-test.

C. Findings and Discussion

1. Findings

The analysis in this study consists of two, namely descriptive analysis and inferential analysis. The descriptive analysis consisted of the teacher's observation sheet analysis and the student's observation sheet analysis.

The teacher's observation sheet is used to see whether the teacher can carry out the learning process in accordance with the existing syntax, namely the contextual learning model. The results of the teacher's activity observation sheet can be seen in table 1 below.

Table 1. Results of Teacher Activity Observation Sheet for Experiment Class and Control Class

Class	Teacher Activities			Mean
	Meeting 1	Meeting 2	Meeting 3	
Experiment	57,14%	80,95%	85,71%	74,60%
Control	59,6%	70,3%	81,4%	70,43%

From the results of the analysis in table 1, it can be seen that the percentage of teacher activity in the learning process in the experimental and control classes has increased, the average for the experimental class is 74.60% and the control class has an average of 70.43%. This shows that the percentage of teacher activity in carrying out learning at each meeting is included in the active category.

Student activity observation sheets are used to see if students can carry out the learning process according to the syntax in the contextual learning model. The results of the student activity observation sheet can be seen in table 2 below.

Table 2. Results of the Student Activity Observation Sheet for Experiment Class and Control Class

Class	Teacher Activities			Mean
	Meeting 1	Meeting 2	Meeting 3	
Experiment	66,6%	79,16%	87,5%	77,75%
Control	62,5%	70,8%	79,1%	74,95%

From the results of the analysis in table 2, it can be seen that the percentage of student activity in the learning process in the experimental and control classes has increased, the experimental class has an average of 77.75% and the control class has an average of 74.95%. This shows that students are active in the learning process.

Inferential analysis is used for statistical test results on the hypothesis and has been proposed in this study, namely improving student learning outcomes who are taught using contextual learning models assisted by hands on problem solving and conventional learning. Before testing the hypothesis, first the assumption test is carried out, namely the normality test of the homogeneity of variance data.

Data normality analysis was conducted to determine whether the student learning outcomes data obtained were normally distributed or not, while the homogeneity test analysis was conducted to determine whether the student learning outcomes data obtained were homogeneous to the population or not. The inferential analysis stage in this study is described as follows.

The normality test of the data in this study used the Kolmogorov Smirnov test statistic with the condition that if the value of Sig. (2-tailed) > $\alpha = 0.05$, then H_0 is accepted. For manual calculations which can be seen in the attachment, then for calculations with the help of the SPSS 19 application for windows, the Kolmogorov-Smirnov test is also used which can be seen in table 3 below.

Table 3. Data Normality Test Results for Experiment Class and Control Class

	Experiment	Control
Asymp. sig. (2-tailed)	0,116	0,192

Based on the results of the analysis of the normality test in the experimental class, the value of sig (2-tailed) = 0,116 > $\alpha = 0,05$ was obtained and the control class obtained the value of Sig. (2-tailed) = 0,192 > $\alpha = 0,05$, then H_0 accepted. With the acceptance of H_0 it can be concluded that the data is normally distributed.

The homogeneity of variance test was used to determine whether the two groups data on mathematics learning outcomes are homogeneous or not. The statistical test used in this study is Fisher's exact test. See table 4 below.

Table 4. Test of Homogeneity of Variance of Data for Improving Students' Mathematics Learning Outcomes

F_{count}	F_{table}	Result
1,077	3,99	Homogeneous

Based on table 4, the data on the results of increasing the value of students' mathematics learning outcomes in both classes obtained the value of $F_{count} = 1,077 < F_{table} = 3,99$. Thus, the sample data on the increase in the value of students' mathematics learning outcomes in both classes are homogeneous..

Hypothesis testing in this study used an independent t-test using the SPSS application.

Since $dk = 62$ in the t table, we get $t_{table} = 1,6698$ and $t_{count} = 14,698$ because $t_{table} (1,6698) < t_{count} (14,698)$ then $t_{count} > t_{table}$ then H_0 rejected. This means that at a significant level of $\alpha = 0,05$, it can be concluded that the Hands On Problem Solving Contextual Learning Model is more effective than the conventional learning model.

2. Discussion

Student learning outcomes were obtained through written learning outcomes tests. This test is given during the learning process to determine the success of implementing contextual learning through Hands On Problem Solving on square and rectangular material, students analyze and identify problems, develop hypotheses, collect and analyze information and make conclusions as a result of learning objectives. 6, the standard deviation of 6.89, the highest value of 88 and the lowest score of 60. While the learning outcomes in the control class consisted of 32 students, obtained an average of 66, standard deviation of 6.68, the highest score of 78, and the lowest is 55. This shows that the learning outcomes of students who are taught using the Contextual learning model assisted by Hands On Problem Solving are significantly higher than the learning outcomes of students who are taught using conventional learning models.

Based on the results of the research in the hypothesis testing section using the t-test with a significant level of $\alpha = 0,05$ the values obtained are $t_{table} = 1,6698$ and $t_{count} = 14,698$ because $t_{table} (1,6698) < t_{count} (14,698)$ means $t_{count} > t_{table}$ then H_0 is rejected. Thus, inferentially the average ability of students' learning outcomes who are taught using the contextual learning model assisted by Hands On Problem Solving is higher than the average ability of students' learning outcomes who are taught using conventional learning models. This is also in line with research conducted by Mustika (2016) which states that with contextual learning through Hands On Problem Solving on Cube and Block material, student learning outcomes reach a good category. The things that cause students to achieve good category scores are because the application of the contextual learning model assisted by Hands On Problem Solving can help students to more easily understand and be creative because the Contextual learning model assisted by Hands On Problem Solving is not positioned as a learning goal, but as a tool. to form as students' understanding of mathematics in the learning process.

D. Conclusion

Based on the results of research conducted at SMP Negeri 1 Latambaga regarding the effectiveness of contextual learning models assisted by hands on problem solving, student learning outcomes taught using contextual learning models assisted by hands on problem solving were significantly more effective in improving student learning outcomes for class VII SMP Negeri 1 Latambaga.

Teachers are expected to have sufficient knowledge and ability to choose appropriate learning methods and in accordance with the material to be taught so as to improve student learning outcomes. And to further researchers, who want to develop this research, they can do it on other materials in an effort to improve students' mathematics learning outcomes.

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