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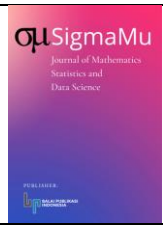

Influence of Type Cooperative Learning Model *Two Stay Two Stray* On Student Mathematics Learning Outcomes

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Abstract: This research aims to determine the effect of the cooperative learning model type*Two Stay Two Stray* (MP-TSTS) on the mathematics learning outcomes of class VIII students at MTs Al Aziziyah Putra Gunungsari. The type of research used is quantitative descriptive research*Post-test Only Control Design*. The population in this study were all class VIII students at MTs Al Aziziyah Putra Gunungsari, consisting of 8 classes. The sample in this research was students in classes VIII A and VIII B. The instrument used in this research was a learning outcomes test. The data collected consists of student learning outcomes data. Data were analyzed using descriptive analysis. Results of inferential analysis using test independent *sample t-test* with the help of*SPSS 23* to test the hypothesis shows that the student learning outcomes data on post-test, *gain* normalized and student learning outcomes data with a significant value (2-tailed) < 0.05, namely 0.029. So the learning outcomes of students who use MP-TSTS and students who use the small group discussion method are significantly different. This means that MP-TSTS has an effect on improving learning outcomes. Based on the results of the inferential analysis, it can be concluded that the implementation of MP-TSTS is effective/influenced on the mathematics learning outcomes of class VIII students at MTs Al Aziziyah Putra Gunungsari for the 2022/2023 academic year.

Keywords: *Two Stay Two Stray*, *Post-test Results*, *Student Activities*.

Introduction

Mathematics is one of the basic sciences that has an important role in the world of education. Mathematics learning must be able to make students active, both in studying mathematics subject matter and working together (Danic, Japa, & Diputra, 2019). Students are expected to be able to understand mathematical concepts on their own and be active in solving problems, from understanding the problem to finding solutions to the problem (Fathani, 2016). In this way, students

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will have the ability to reason logically and critically, so that students will more easily understand mathematical concepts which will influence students' mathematics learning outcomes.

Based on data obtained from the class VIII mathematics teacher at MTs Al Aziziyah Putra Gunungsari, it is known that semester test scores in mathematics are still low. It can be seen from the average score that has not been completed because it has not reached the Minimum Completion Criteria (KKM). The low learning outcomes achieved by class VIII students at MTs Al Aziziyah Putra Gunungsari indicate that the teaching and learning activities carried out at school have not been effective. One of the contributing factors is that the learning methods applied in the school have not yet led to an appropriate teaching approach. The learning methods and models used are sometimes not appropriate to the condition of the students as students, the nature of the teaching materials, the available media facilities, the conditions of the class and the teacher himself.

Low mathematics learning outcomes are also influenced by several factors that arise within students, for example learning activities (Aziz.A & Yusnita Y, 2017). Learning activities are an indicator of students' desire to learn. Learning activities are what will encourage the formation of knowledge and skills that will lead to improved learning outcomes. So we need a learning model that is able to make students active, interact with each other, and discuss solving problems with each other, so that students will be able to build their own knowledge. One learning model that is based on constructivism theory is cooperative learning.

Several studies on cooperative learning have shown how this method can develop the achievements of students. However, this research also shows the reasons that cooperative learning is true enhancement student achievement, and most importantly, the elements of cooperative learning must be in place if maximum impact and achievement is desired (Slavin, Robert E. 2005). The application of cooperative learning methods can provide students with the opportunity to maximize their abilities by working together with one another and fostering enthusiasm in the learning process in the classroom. So the cooperative learning model will be able to bring about changes in student learning by increasing student learning outcomes. One of them is through the implementation of MP-TSTS.

The reason researchers apply MP-TSTS is because this learning model requires students to be able to share information at the same time with different partners in a short time systematically. With this learning model students will have the opportunity to share information with other groups. In this way, students will be encouraged to play an active role in discussing and seeking information. According to Dian (2015), MP-TESTS also has the advantage of very large student involvement in the learning process. So it is hoped that by implementing MP-TSTS it is hoped that it can improve students' mathematics learning outcomes. So the cooperative learning model will be able to bring about changes in student learning by increasing student learning outcomes.

Method

The type of research used in this research is quantitative descriptive research. Descriptive research is the most basic form of research. Shown to describe or illustrate existing phenomena, both natural phenomenon or human engineering (Sukmadinata, 2011). By design posttest *only control design.*

The sample in this study was class VIII A as the experimental class and class VIII B as the control class. The sample is part of the number and characteristics of the population (Sukmadinata, 2011). With Technique Data collection takes the form of initial observations, interviews, learning results tests and observations of student activities.

Technique Data analysis in this study used technique quantitative analysis. According to Sugiyono (2017) Research methods are based on philosophy positivism, used to research certain

populations or samples, data collection using research instruments, quantitative or statistical data analysis, with the aim of testing established hypotheses.

Quantitative analysis of student learning outcomes data:

Normality test

Normality test uses the Chi Square test with the formula:

$$X_h^2 = \frac{(fO - fh)}{2fh} \quad (1)$$

Where:

X_h^2 = Chi Square Price

f_O = Actual frequency

f_h = Frequency of expectations

Homogeneity Test

The homogeneity of variance test uses the F test with the following formula:

$$F = \frac{biggest\ variant}{smallest\ variant} \quad (2)$$

Hypothesis testing

In this research, the t-test was used with the following formula:

(Separated variance)

$$t = \frac{X_1 + X_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad (3)$$

Information :

X_1 = class average value experiment

X_2 = average value of the control class

S_1^2= variants experimental class

S_2^2= control class variance

n_1 = number of students in the experimental class

n_2 = number of students in the control class

Qualitative analysis of student learning outcome data based on Mi (ideal mean) and SDi (ideal standard deviation). Based on standard scores, the criteria for determining student learning outcomes are described in the following table:

Table 1 Criteria for determining student learning outcomes are based on standard scores.

Interval	**Criteria**
Mi + 2 SDi ≤ X ≤ Mi + 3 SDi	Very effective
Mi + 1 SDi ≤ X < Mi + 2 SDi	Effective
Mi - 1 SDi ≤ X < Mi + 1 SDi	Effective enough
Mi - 2 SDi ≤ X < Mi - 1 SDi	Less effective

Mi - 3 SDi ≤ X < Mi - 2 SDi	Very less effective

Description: X is the average learning outcome

Table 2 Category Rating Scale Observation Sheet of student activities**.**

No.	Percentage	Assessment criteria
1	81,25% - 100 %	Very active
2	62,50% - 81,24%	Active
3	43,75% - 62,49%	Quite Active
4	25,00% - 43,74%	Less Active

Result and Discussion

Normality test

This normality test uses help*SPSS 23* with technique*Shapiro-Wilk.*

Table 6 Final Data Normality Test

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	Df	Say.	Statistic	Df	Say.
MTK Learning Results	Experiment	.146	24	.200*	.938	24	.150
	Control	.163	24	.100	.947	24	.238

In Table 6, the final data normality test that has been carried out, for the experimental and control classes, obtained a significance value of ≥ 0.05, so it can be concluded that the average data in the experimental class is normally distributed.

Homogeneity Test

Table 7. Final Data Variance Homogeneity Test

Test of Homogeneity of Variances			
MTK Learning Results			
Levene Statistic	df1	df2	Say.
0.008	1	46	0.928

In Table 7, the final data homogeneity test shows that the value its significance is 0.928. Because the value obtained from the homogeneity test has a significance level of ≥ 0.05, the data has the same variance value/is not different (homogeneous).

Hypothesis testing

The calculation results show that the data for both classes is normally distributed and homogeneous. To test the difference between the two means between the experimental and control classes, the test-*t* or test a hypothesis using*SPSS 23* based on table 8.

Table 8. Uji Independent T-Test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Say.	T	Df	Say. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Learning outcomes	Equal variances assumed	.008	.928	2.260	46	.029	11.87500	5.25462	1.29800	22.45200
	Equal variances not assumed			2.260	45.973	.029	11.87500	5.25462	1.29783	22.45217

Based on Table 8, to determine the level of significance of the difference, you must look at the sig (2-tailed) value. At a significance level of 5%, a sig (2-tailed) value of 0.029 is obtained. Because the sig value (2-tailed) = 0.029 > 0.05, you can concluded that there is a significant difference between the average value of learning outcomes for the experimental class and the control class. Kadek & Arthaningsih (2018) stated that the Two Stay Two Stray learning model has a significant influence on mathematics learning outcomes for fifth grade elementary school students. Second, research conducted by Yurniwati & Handayani (2019) regarding the Two Stay Two Stray learning model. Obtained analysis results, namely that there is a significant difference between mathematics learning outcomes that apply the Two Stay Two Stray learning model and learning outcomes that apply the conventional learning model, with significant values 0.000>0.005. Third, research conducted by Febriyanti, Jampel, & Syahruddin (2014), regarding the Two Stay Two Stray model. With research results showing that the use of the Two Stay Two Stray learning model has an effect on improving mathematics learning outcomes

Discussion

To determine the effect of MP-TESTS on students' mathematics learning outcomes, it is shown by the average score*(mean)* in the experimental class, which was 76.33, which was greater than the average value*(mean)* in the control class, it was 64.46. So data processing is carried out to test the hypothesis can sig value (2-tailed) = 0.029 > 0.05 This shows that there is a significant influence between the average value of mathematics learning outcomes for the experimental and control classes. So it can be concluded that the use of MP-TSTS is effective on the mathematics learning outcomes of class VIII students at MTs Al Aziziyah Gunungsari for the 2022/2023 academic year. According to Junia (2020), it is very necessary to evaluate learning outcomes to find out whether the learning process carried out by teachers and students is effective or not. Evaluation is intended as a mirror to look back at whether the goals set have been achieved and what the teaching and learning process has been like taking place effective for obtaining learning outcomes (Purwanto, 2014).

In this research, the experimental class and control class were taught by the same teacher, the materials, data collection techniques, instrument form, learning objectives, time allocation and

assessment were the same. This proves that the differences in learning outcomes are only caused by differences treatment between the experimental class and the control class. The experimental class was given special treatment, while the control class received no special treatment. The special treatment in question is learning using MP-TSTS.

The findings obtained by the researchers above are in accordance with the advantages of MP-TSTS, namely the tendency for student learning to become more meaningful, more oriented towards active student learning, helping to increase student interest and learning outcomes. gives groups the opportunity to share results and information with other groups, greatly involving students in the learning process (Lie, 2008).

So, MP-TESTS can be a learning alternative that can more effectively improve student learning outcomes when compared to learning that uses ordinary group discussion methods. The impact of this learning is largely determined by its planning and implementation in the classroom. So skills are needed to manage and organize classroom conditions. According to Arianti, Akib, & Saleh (2017), the Two Stay Two Stray (TSTS) cooperative learning model provides an opportunity for groups to develop information results with other groups by having two group members stay and two group members as guests.. This is in accordance with that opinion say that the influence of learning is the level of achievement of training objectives. Achieving these goals takes the form of increasing knowledge and skills as well as developing attitudes and through the learning process (Samora, 2009).

Conclusion

Based on the results of the research and discussion, it can be concluded that the use of the cooperative learning model is type two *stay two stray* influential to Mathematics learning results for class VIII students at MTs Al Aziziyah Putra Gunungsari for the 2022/2023 academic year.

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