

SNOWBALL THROWING AND TWO STAY TWO STRAY TOWARD MATHEMATICS OUTCOMES OF EIGHT GRADE STUDENT

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ABSTRACT

The Cooperative learning model is still rarely used as an alternative solution to overcome passive learning. This study aimed to compare the cooperative learning Snowball Throwing model and Two Stay Two Stray toward mathematics outcomes of eighth-grade students in SMP Muhammadiyah 1 Godean Sleman regency on the odd semester academic year of 2017/2018. The population in this study was eight grade students consisting of 5 classes. The sampling technique uses a random sampling technique that was by lottery class. From the lottery earned that grade VIII A class experiment as Snowball Throwing class and VIII B class experiment as Two Stay Two Stray class. Mathematics learning outcomes data obtained using the test method in the form of objective questions. Analysis of the data used analysis prerequisite and two-tailed t-test and one-tailed t-test. The test results obtained by the two-tailed t-test $t_{\text{count}} = 2,4718$ and $t_{\text{table}} = 1,9979$ mean $t_{\text{count}} > t_{\text{table}}$ with a significance level of 5% and 67 degrees of freedom, which means H_0 was rejected. This suggests that there were differences in mathematics achievement between students who use the cooperative model of the Snowball Throwing and cooperative model of Two Stay Two Stray. One-tailed t-test result obtained that $t_{\text{count}} = 5,0423$ and $t_{\text{table}} = 1,6690$, it means $t_{\text{count}} > t_{\text{table}}$ with a significance level of 5% and 67 degrees of freedom, which means H_0 was rejected. This suggests that the learning outcomes of students who use the cooperative model of Snowball Throwing were better than learning outcomes of students who use the cooperative model of Two Stay Two Stray toward mathematics of eighth-grade student SMP Muhammadiyah 1 Godean Sleman regency on the odd semester academic year of 2017/2018.

Keywords: Effectiveness, Snowball Throwing, Two Stay Two Stray, Learning Outcomes

INTRODUCTION

The teacher can directly create conditions and situations that allow students to form meaning from the materials learned through the learning process and store them in memory that can be processed and leveraged further. Improving the quality of education can also be seen from the learning process at the school, both the learning process and student learning outcomes. The efforts that must be made by the teacher to achieve the learning objectives include: choosing a model that is suitable for the material and supporting the creation of conducive teaching and learning activities.

One way is to use the cooperative learning model of teaching and learning strategies by different grouping levels of ability into small groups. In cooperative learning, students believe that their success will be achieved if and only if each group member succeeds. In the existing education unit level curriculum, so far, it has implemented group learning. However, these group activities tend just to complete the task and do not indicate the process of students understanding or not the material being studied by students. Students with low ability have less role in completing assignments. In contrast, in cooperative learning, the goals are made in small groups, completing the given task, and ensuring that each group masters the given task and can complete the given task.

The use of direct learning models makes students passive. Students' passivity during the learning process is seen when the teacher explains the material the students are listening to. However, there is no communication between the teacher and the students when the teacher asks questions. Students keep quiet and never want to ask even though they do not understand what the teacher is saying, resulting in low learning outcomes in mathematics. Based on interviews with students, learning

mathematics is still considered something difficult, complicated material, and an annoying learning process, so it becomes an excuse for students to be lazy to follow mathematics learning.

Based on data from the End of Year Semester Year 2016/2017 academic year assessment data, there are still many students who score below the Minimum Completeness Criteria (MCC) set at 70. In learning Mathematics in SMP Muhammadiyah, 1 Godean Guru still uses a direct learning model, a teacher-centered learning model. Through this model, teachers convey the learning materials in a structured way with the hope that the lesson material delivered can be mastered by the students well. Based on the student's observations on mathematics learning conducted on 28 April 2017 at SMP Muhammadiyah 1 Godean.

Students who earn more than MCC are not present; this suggests that mathematical subjects are difficult. In the learning process, many students chat with their peers, others who play in the classroom, and do not pay attention to what teachers are teaching; choosing the right learning model will contribute To learning success. The chosen learning Model must keep students interested in following the learning so that students understand the materials teachers teach. There are a variety of cooperative learning models that can be used as an alternative, such as Snowball Throwing and Two Stay Two Stray, the Cooperative learning model of Snowball Throwing and Two Stay Two Stray have the equation that makes students Become active in learning and make the unsaturated students just sit listening to what the teacher delivered. The difference in Snowball Throwing trains students to submit questions or concerns in a written form that will be discussed together, so students can express the difficulties he experienced in the understanding Subject matter, and this model can also train students readiness in addressing and complete problems, while Two Stay Two Stray can train students to listen to the opinions of others, and add to the student's practice and self-confidence.

Also, both models of cooperative learning are expected to help students understand math subjects more quickly so that the objectives in learning can be achieved. According to a statement from Waka SMP Muhammadiyah 1 Godean, that the composition of class VII students who climbed to class VIII did not change.

METHODS

This research is a true-experimental type of research. The research design used was a Posttest-Only Control Design research design. This design is used in experiments that use classes or groups that already exist, namely choosing homogeneous classes.

Table 1. Research Design

	Class	Treatment	Posttest
R	Experiment 1	X_1	O_2
R	Experiment 2	X_2	O_4

The study was conducted in SMP Muhammadiyah 1 Godean, held in July of the term of the school year 2017/2018. The population in this research is grade VIII students of SMP Muhammadiyah 1 Godean Kabupaten Sleman, semester 2017/2018, consisting of 5 classes.

In this study, the way used for sampling is with Random Sampling. In this study, samples were to be used, i.e., randomly selected classes through the lottery process. So all classes have the same opportunity to be a sample. After the drawing process, I obtained class VIII A as Experimental Class 1 and class VIII B as experimental Class 2. Then, determine which classes use the Snowball Throwing learning model and which uses the Two Stay Two Stray Learning model to draw again. Gained VIII A class using the Snowball Throwing Learning model and class VIII B using the Two Stay Two Stray learning model. The variables in this study are the cooperative learning model of Snowball Throwing type, a cooperative learning model of two Stay two Stray, the result of mathematics learning students of Grade VIII SMP Muhammadiyah 1 godean Sleman Regency Terms school year 2017/2018.

This study used data collection techniques in the form of documentation engineering and test techniques. The instruments used in this study are optional tests. The assessment in this test, the correct

answer was given a score of 1, and the answer was incorrectly given a score of 0. The objective of teaching cognitive aspects is only covering the memory aspects (C_1), Aspects of Understanding (C_2), and the implementation aspects (C_3). Validity and reusability of instruments are:

1. Validity test
2. Power Test differentiator
3. Reusability Test

Data Analysis Techniques are:

1. Descriptive analysis
2. Test normality
3. Test homogeneity
4. Hypothesis Test

RESULTS AND DISCUSSION

Description of initial proficiency value

Table 2. Description of initial proficiency value

Class	Score				
	Highest	Lowest	\bar{X}	S	S^2
Experiment I	55	20	36,7429	9,6416	92,9613
Experiment II	53	18	32,9118	7,7981	60,8102

Based on the table above it looks that $\chi^2_{count} = 3.2163$ and $\chi^2_{table} = 7.8147$, so $\chi^2_{count} < \chi^2_{table}$ at a significant level of 5% and degrees of freedom 3 for experimental class I and $\chi^2_{count} = 2.0970$ and $\chi^2_{table} = 5.9915$, so $\chi^2_{count} < \chi^2_{table}$ at a significant level of 5% and degree of Freedom 2 for the II experimental class. From the test results, normality is derived that the value of the initial mathematical ability is standard distribution data.

Based on the results of a homogeneity test that has been done in classes VIII A, VIIIB, VIII C, VIII D, and VIII E, with a degree of freedom four and a significant level of 5% then it can be seen that $\chi^2_{count} = 2.9337$ and $\chi^2_{table} = 9.488$, so $\chi^2_{count} < \chi^2_{table}$ which means that the seventh class has the same variance (has a homogeneous variance).

Based on the results of the analysis conducted with a significant level of 5% and degrees of freedom 67 obtained $-t_{table} = -1.9979$, $t_{count} = 1.8816$, $t_{table} = 1.9979$ meaning $-t_{table} < t_{count} < t_{table}$ then H_0 accepted and H_1 rejected which means that it does not There is a difference in the ability of early grades VIII students A and VIII B SMP Muhammadiyah 1 godean Kabupaten Sleman School year Handicap Semester 2017/2018. So it can be said that both classes have the same ability.

Description of Student mathematics learning test scores.

Table 3. Summary description of Math learning outcomes Value

Class	Score				
	Highest	Lowest	\bar{X}	S	S^2
Experiment I	86,67	46,67	63,8095	8,8982	79,1783
Experiment II	80,33	33,33	50,9800	12,0464	145,1169

Based on the table above it is seen that $\chi^2_{count} = 5.8121$ and $\chi^2_{table} = 7.8147$ that means $\chi^2_{count} < \chi^2_{table}$ at a significant level of 5% and degree of Freedom 3 for experimental class, I whereas for experimental class II obtained $\chi^2_{count} = 3.6445$ and $\chi^2_{table} = 7.8417$ means $\chi^2_{count} < \chi^2_{table}$ at a significant level of 5% and the degree of Freedom 3. It turns out that the value of learning mathematics is standard distribution data.

Based on the results of the homogeneity test done in class VIII A and Class VIII B with a degree of freedom one and a significant level of 5% then it can be seen that $\chi^2_{count} = 3.035$ and $\chi^2_{table} = 3.841$, so $\chi^2_{count} < \chi^2_{table}$ which means That both classes have a homogeneous variance.

Based on the results of the analysis conducted with a significant level of 5% and the degree of Freedom 67, then obtained the value of $t_{count} = 2.4718$, $t_{table} = 1.9979$, which means $t_{count} > t_{table}$ then H_0 rejected and H_1 accepted which means that there are differences in learning outcomes Mathematics between students who learn with a model of cooperative learning of the Snowball Throwing with the results of mathematics learning students using a cooperative learning model type Two Stay Two Stray in grade VIII students SMP Muhammadiyah 1 Godean of Sleman Regency Semester Gasal year 2017/2018.

Based on the results of the analysis conducted with a significant level of 5% and the degree of freedom 67, it obtained the value of $t_{count} = 5.0423$ and $t_{table} = 1.6690$ which means $t_{count} > t_{table}$ then H_0 rejected and H_1 accepted which means that the learning Model The cooperative type of Snowball Throwing is more effective than a model of cooperative learning type Two Stay Two Stray to the results of mathematics learning student Grade VIII SMP Muhammadiyah 1 Godean Kabupaten Sleman Gasal Semester 2017/2018.

RESULTS AND DISCUSSION

Based on the hypothesis test result at the initial ability, it can be concluded that both classes have the same ability. In experimental Class 1, the mathematical learning process was given treatment using the Snowball Throwing type Cooperative learning model, which is the implementation of the learning with several stages. That is, the teacher formed a group of 4 students. In each group heterogeneous the value of the results of the study, then the teacher calls each chairman of the group to be given the material explanation and division of worksheet, then the teacher instructs each chairman of the group to return to the group Each then explains the material to be discussed, and the teacher shares the paper with each student to write a question regarding the material that has been given when it finishes making the question, the teacher instructs students to make a question paper into a ball that will be thrown into another group, then the teacher instructs each group to present the results of his work then the teacher gives an assessment of the group's work.

In the experimental class II, the mathematical learning process uses a model of Coopertaif learning type Two Stay Two Stray. With some stages, the teacher formed a group of 4-5 students in each group, then the teacher gave the task to each group to be discussed and worked together, and then two members from each group left the group, and each of the two members of the other group. After that, two returning students returned to the original group and reported what results they had found from other groups, then the group compared and discussed their work.

Based on the results of the analysis of the two-party hypothesis test mathematics conducted with a significant level of 5% and the degree of Freedom 67 then obtained value $t_{count} = 2.4718$, $t_{table} = 1.9979$, which means that $t_{count} > t_{table}$ then H_0 rejected and H_1 accepted that It means that there is a difference of students mathematical learning outcomes using the Cooperative learning model of Snowball Throwing with students mathematical learning outcomes that employ Two Stay Two Stray Model of cooperative learning in grade VIII students SMP Muhammadiyah 1 Godean of Sleman Regency semester 2017/2018.

The occurrence of differences in the experiment class I and the II experimental class because in the class of students, I was involved directly, and each student was required to have responsibility within each group. In the step learning model of Snowball Throwing, students are actively involved in learning and making students ready with various possibilities because students do not know what their friends are doing. With this model's application, group discussions and interaction between students from different groups enable the occurrence of knowledge and experience in the effort to solve problems that arise in the discussions that take place More interactive and enjoyable so that students' understanding will increase.

While in the experimental class II, although students work in groups, there are still passive students who do not perform the activities that they are responsible for. Next based on the results of the analysis of the hypothesis test one party mathematics learning results conducted with the level of 5% and Freedom Degree 67 then obtained the value of $t_{count} = 5.0423$, $t_{table} = 1.6690$ which means $t_{count} > t_{table}$ then H_0 rejected and H_1 is accepted, meaning that the model of the Snowball Throwing type Cooperative learning is more effective than the Two Stay Two Stray Model of cooperative learning towards students of mathematics from grade VIII of SMP Muhammadiyah 1 Godean. Regency of Sleman semester 2017/2018.

Based on the mathematical learning process using the Snowball Throwing type, Cooperative learning is more effective than using a Two Stay Two Stray type learning model. Because in cooperative learning the Snowball Throwing type is an active role among students explaining the material and students who receive the material explanation so that each student is involved in the learning process and the student has the opportunity to develop the ability of thinking because given the opportunity to make questions and given to other students, so that formed a more useful discussion in working on student worksheets.

Obtained from the learning outcomes for class VIII SMP Muhammadiyah 1 Godean Kabupaten Slemaan The school year, 2017/2018, is more effective in the type of cooperative learning model Snowball Throwing. The research conducted by Henny Kurnia Dewi; Erni Puji Astuti; Heru, the Snowball Throwing-type cooperative learning is more effective than the cooperative learning model of type Two Stay Two Stray.

REFERENCES

- Henny kurnia dewi; Erni Puji Astuti; Heru Kurniawan. 2015. Eksperimentasi Model Pembelajaran Two Stay Two Stray dan Snowball Throwing Terhadap Prestasi Belajar Siswa Kelas VII SMP N 38 Purworejo. Vol 16, No. 1.
[http://id.portalgaruda.org/?ref=search&mod=document&select=title&q=Eksperimentasi+Model+Pembelajaran+Two+Stay+Two+Stray+dan+Snowball+Throwing+Terhadap+Prestasi&button=search+document.\(diakses+pada+tanggal+27+september+2017+pukul+23.45\).](http://id.portalgaruda.org/?ref=search&mod=document&select=title&q=Eksperimentasi+Model+Pembelajaran+Two+Stay+Two+Stray+dan+Snowball+Throwing+Terhadap+Prestasi&button=search+document.(diakses+pada+tanggal+27+september+2017+pukul+23.45).)
- Sudjana. 2002. *Metoda Statistika*. Bandung: Tarsito
- Sugiyono. 2011. *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.
- Suharsimi Arikunto. 2013. *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta: Rineka Cipta.
- _____. 2009. *Dasar-Dasar Evaluasi Pendidikan*. Jakarta: Bumi Aksara.