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EFFECTIVENESS OF COOPERATIVE LEARNING MODEL OF SNOWBALL THROWING TYPE AND COOPERATIVE LEARNING MODEL OF GROUP INVESTIGATION TYPE TOWARD MATHEMATICS LEARNING OUTCOMES IN CLASS VIII OF SMP MUHAMMADIYAH 7 YOGYAKARTA

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ABSTRACT

The reason for the research that the learning process uses in SMP Muhammadiyah 7 Yogyakarta tends centered to the teacher, students becoming passive and less involved in the learning process, so that needed model of learning that involved students becoming active. Model of learning that can provide opportunities for students to actively is a cooperative learning model of snowball throwing and cooperative learning model of group investigation. This study aims to determine the effectiveness of the cooperative learning model of snowball throwing type and cooperative learning model of group investigation type toward mathematics learning outcomes in second grade of SMP Muhammadiyah 7 Yogyakarta in odd semester academic year of 2016/2017. The population in this study were all students of class VIII SMP Muhammadiyah 7 Yogyakarta in the first semester of the academic year 2016/2017 is divided seven classes namely class VIII A, VIII B, VIII C, VIII D, VIII E, VIII F, VIII G totaling 150 students. Samples were taken 3 classes using random sampling techniques, derived class VIII B as an experimental class I, VIII D class as the experimental class II, and VIII C class as the control class. Data analysis techniques used for prerequisite tests including normality test with chi-square formula, bartlett homogeneity test by test, and test hypotheses include F test and significant raced different (LSD). The result on significant level 5% and db = (2,98) shows (1) there are different results of the mathematics learning uses model of learning snowball throwing, model of group investigation, and model of learning expository. This is shows with value $F_{count} = 13,5349, F_{table} = 3,099$ so that $F_{count} > F_{table}$ and (2) the results mathematics learning of the students that use the cooperative learning model of snowball throwing better than learning process uses cooperative learning model of group investigation and model of learning expository. This result shows with hypothesis test LSD which is significant level 5% and 98 degrees of freedom is obtained in case I because $|\bar{x}_1 - \bar{x}_2| = 6,122727 > LSD = 4,814\ H_0$ rejected, and $\bar{x}_1 = 78,5 > \bar{x}_2 = 72,37727$ it is mean that $\mu_1 > \mu_2$. In case II $|\bar{x}_1 - \bar{x}_3| = 12,35294118 > LSD = 4,778\ H_0$ rejected, and $\bar{x}_1 = 78,5 > \bar{x}_3 = 66,14705882$ it is mean that $\mu_1 > \mu_3$. While in case III $|\bar{x}_2 - \bar{x}_3| = 6,23021391 > LSD = 4,814\ H_0$ rejected, and $\bar{x}_2 = 72,37727 > \bar{x}_3 = 66,14705882$ it is mean that $\mu_2 > \mu_3$. While can concludes as follow $\mu_1 > \mu_2 > \mu_3$.

Keywords: effectiveness, model of learning snowball throwing, model of group investigation, model of learning expository

INTRODUCTION

Education is one of the important needs for the progress of a nation and cannot be separated from human life, because the progress of a nation can be seen from the quality of education. Good quality education will certainly produce quality Human Resources (HR). To get good quality education, which is during the learning process, in this case the school is one of the educational institutions where the learning process occurs to develop the personality and potential of all students, but also teachers in teaching where the subject matter is presented and studied effectively and efficiently so that helping students to be able to understand concepts and be able to apply concepts that are understood.

Based on information from a grade VII mathematics teacher at Muhammadiyah 7 Yogyakarta Middle School, the learning model used is still using expository learning model, which is a teacher-centered approach, so students are less actively involved in learning mathematics, students rarely ask questions to teachers when learning directly even though the teacher has tried to lure students with questions so that students do not understand the material presented.

Based on the results of class VII observations conducted at SMP Muhammadiyah 7 Yogyakarta, during the learning process students only listen, take notes, do what the teacher tells them to do, not dare to ask about difficulties in understanding the material. Teachers also do not provide a variety of learning models to overcome the boredom and boredom of students in learning. It is this activity that makes student mathematics learning outcomes low. Learning outcomes in the form of Final Examination scores (UAS) is one illustration that shows the learning outcomes of students of Muhammadiyah 7 Yogyakarta Middle School. Based on the average end-of-semester test scores of mathematics subjects in VII grade of SMP Muhammadiyah 7 Yogyakarta in the academic year 2015/2016 can give a picture of student learning outcomes are still low.

One of the factors that influence student learning outcomes is the learning model used. "The learning model is a pattern that is used for curriculum preparation, organizing material, and giving instructions to teachers in the class" (Suprijono, Agus. 2011: 45). Among the many cooperative learning models that can invite students to be actively involved and think creatively include the Snowball Throwing learning model and the Group Investigation learning model.

The formulation of the problem in this study is 1) Are there differences in student learning outcomes in mathematics using the Snowball Throwing cooperative learning model, Group Investigation type cooperative learning model, and expository learning models in class VIII students of SMP Muhammadiyah 7 Yogyakarta odd semester 2016/2017 school year? 2) Which is more effective between the Snowball Throwing cooperative learning model, the Group Investigation cooperative learning model, and the expository learning model towards the mathematics learning outcomes of VIII grade students of SMP Muhammadiyah 7 Yogyakarta in the odd semester of 2016/2017 school year ?.

The purpose of this study are 1) To find out the presence or absence of differences between students' mathematics learning outcomes using the Snowball Throwing cooperative learning model, the Group Investigation cooperative learning model, and expository learning models for VIII grade students of SMP Muhammadiyah 7 Yogyakarta in odd semester 2016/2017 teaching. 2) To find out which is more effective between the Snowball Throwing cooperative learning model, the Group Investigation cooperative learning model, and the expository learning model towards the mathematics learning outcomes of VIII grade students of SMP Muhammadiyah 7 Yogyakarta in the odd semester of 2016/2017 school year.

THEORY

Mathematics is one branch of human science that is very useful in human life in the face of a problem. As stated by Uno, Hamzah B. (2014: 129-130) that mathematics is a field of science which is a tool of thought, communication, a tool to solve various practical problems, the elements of which are logic and intuition, analysis and construction, generality and individuality and have branches including arithmetic, algebra, geometry, and analysis.

According to Fathurrohman, Muhammad (2015: 61) snowball Throwing learning model trains students to be more responsive to receive messages from others, and deliver the message to their friends in one group". The steps of snowball throwing cooperative learning according to Suprijono, Agus (2011: 128) are as follows: 1) The teacher presents the material to be presented. 2) The teacher forms groups and calls each group leader to give an explanation of the material. 3) Each group leader returns to his group, each student is given a sheet of work paper to write down any questions related to the material that has been explained by the group leader. 4) Then the paper is made like a ball and collected in one group and then thrown to another group. 5) After students have one ball / one question given the opportunity for students to answer questions written on the ball-shaped paper alternately. 6) Evaluation. 7) Closing.

According to Slavin in Taniredja, et al (2013: 74) the development of Group Investigation cooperative learning is based on the premise that the learning process at school involves areas in the social and intellectual domains, and the process that occurs is a merging of the values of the two domains". According to Slavin in Fathurrohman, Muhammad (2015: 71) the steps in applying the Group Investigation model can be stated as follows: 1,) Topic selection ie students choose subtopics in a general

problem area that is usually described first by the teacher. The students are then organized into task-oriented groups of 2-6 people. Heterogeneous group composition. 2) Planning cooperation ie students and teachers plan various special learning procedures, assignments and general goals that are consistent with the various topics and subtopics that have been selected from step 1. 3) Implementation ie students carry out the plan that was formulated in step 2. learning must involve variety of activities and skills with a wide variety and encourage students to use a variety of resources both inside and outside the school. The teacher constantly follows the progress of each group and provides assistance if needed. 4) Analysis and synthesis, the students analyze and synthesize various information obtained in step 3 and plan to be summarized in an interesting presentation in front of the class. 5) Presentation of the final results ie all groups present an interesting presentation of the various topics that have been studied so that all students in the class are involved and reach a broad perspective on the topic. Group percentages are coordinated by the teacher. 6) Evaluation, namely the teacher and students evaluate the contribution of each group to classwork as a whole. Evaluation can include each student individually or in groups, or both.

The expository learning model is a form of a teacher-oriented learning approach. The steps of the expository learning model according to Sanjaya, Wina (2006: 185-190) are: 1) Preparation, which is the preparation stage related to preparing to receive lessons. The success of the implementation of learning using the expository model is highly dependent on the preparatory step. 2) Presentation, namely the presentation step is the step of delivering the subject matter in accordance with the preparation that has been done, which must be thought by every teacher in this presentation is how so that the subject matter can be easily captured and understood by students. 3) Correlation (Correlation) is the step of correlation is connecting learning material with student experience or with other things that allow students to capture the relationship in the structure of knowledge they have. 4) Summing up (Generalization) is the stage to understand the core (core) of the subject matter that has been presented. The conclusion step is a very important step in the expository model because through the conclusion step students will be able to take the essence of the presentation process. Summing up also means giving students confidence about the truth of an exposure. 5) Applying (Application), this application step is a step to show the ability of students after they listen to the teacher's explanation. This step is a very important step in the expository learning process because through this step the teacher will be able to gather information about the mastery and understanding of subject matter by students.

METHODS

This type of research is experimental research. The design in this study uses three classes, namely experimental class I, experimental class II and control class. In the experimental class, I conducted learning using the Snowball Throwing cooperative learning model, in experimental class II learning, was carried out using the Group Investigation type cooperative learning model, and in the control class the learning model was carried out using an expository learning model. The form of research design used for this study is Pretest-Posttest Control Group Design (Sugiyono, 2009: 76).

The population in this study were all students class VIII odd semester of SMP Muhammadiyah 7 Yogyakarta 2016/2017 academic year consisting of VIII A, VIII B, VIII C, VIII D, VIII E, VIII F, and VIII G totaling 234 students. While the sample in this study was VIII B as the experimental class I, class VIII D as the experimental class II and class VIII C as the control class, the sampling technique used was Random Sampling. The data analysis technique used is the test technique with the instrument in the form of objective questions in the form of multiple choice. The instrument testing uses validity test, reliability test, and different power test. Analysis prerequisite test with normality test with Chi-squared formula and homogeneity test with Bartlet test. The research hypothesis test uses the F-test and LSD advanced test.

RESULTS AND DISCUSSION
1. **Initial Ability (Pretest)**

A description of the initial capability values can be seen in Table 1.

Table 1. Description of Initial Ability Values

Class	Parameter			
	N	The highest	Lowest	$\bar{x}$
Experiment I	34	66,67	33,33	50.44
Experiment II	33	72,22	38,89	52,61
Control	34	72,22	38.39	51,59

Before an average similarity test is performed before the prerequisite tests include normality tests and homogeneity tests. From the initial ability normality test is obtained $x^2_{count}= 0{,}9367 < x^2_{table} = 7{,}8147$ at a significant level of 5% and degree of freedom 3 in the experimental class I, then $x^2_{count} = 4{,}7244 < x^2_{table} = 5{,}9915$ at a significant level of 5% and degrees of freedom 2 in the experimental class II, and $x^2_{count} = 3{,}4523 < x^2_{table} = 7{,}8147$ at a significant level of 5% and a degree of freedom 3 in the control class. The conclusion that data is normally distributed.

Furthermore, the homogeneity test obtained values $\chi^2_{count} = 0{,}857$. In the table of critical values, Chi-Squared with a significant level of 5% and degrees of freedom = 2 obtained $\chi^2_{table} = 5{,}9915$. Evidently $\chi^2_{scount} = 0{,}857$ and $\chi^2_{table} = 5{,}9915$, as a result $\chi^2_{count} < \chi^2_{table}$ then H$_0$ is accepted, which means that all three classes have the same initial capability variance (has a homogeneous variance).

Test the similarity of the average initial ability can be seen in Table 2.

Table 2. Summary of ANAVA Initial Ability Values

Source of Variance	Number of Squares	Dk	Mean Squares	F_{stat}
Treatment	109,292	2	54,646	
Error	10041,58	98	102,465	0,533
Total	10150,87	100		

Based on the results of the analysis carried out with a significant level of 5% and degrees of freedom = (2, 98), the value obtained $F_{count} = 0{,}533$ and $F_{0{,}05(2,98)} = 3{,}099$, as a result $F_{count} < F_{table}$ then H$_0$ is accepted, so there is no difference in the average initial ability of the experimental class I, experimental class II and the control class.

2. **Nilai Hasil Belajar Matematika (*Posttest*)**

After knowing that there was no difference in the initial abilities of the three classes, the experimental class I was treated using the Snowball Throwing cooperative learning model, the experimental class II using the Group Investigation cooperative learning model, and the control class using the expository learning model. After that, the mathematics learning achievement test is given. The results of the analysis of the mathematics learning achievement test are as follows:

The description of the value of learning outcomes can be seen in Table 3.

Table 3. Description of Learning Outcomes

Class	Parameter			
	N	The highest	Lowest	$\bar{x}$
Experiment I	34	90	55	78,50
Experiment II	33	85	50	72,37
Control	34	85	40	66,14

A summary of the results of the normality of learning outcomes can be seen in Table 4.

Table 4. Summary of Test Results for Normality of Learning

Class	x^2_{count}	x^2_{table}
Experiment I	6,2622	7,8147
Experiment II	1,8988	5,9915
Control	0,2981	5,9915

Based on the above table it can be seen that x^2_{count}= 6.2622 < x^2_{table}= 7.8147 at the 5% significance level and degree of freedom 3 in the experimental class I, then x^2_{count}= 1.8988 < x^2_{table} = 5.9915 at a significant level of 5% and degrees of freedom 2 in the experimental class II, and x^2_{count}= 0.2981 < x^2_{table}= 5.9915 at a significant level of 5% and degrees of freedom 2 in the control class. The conclusion that data is normally distributed.

The summary of the homogeneity test results of learning outcomes can be seen in Table 5.

Table 5. Summary of Homogeneity Tests Learning Outcomes

$\chi^2{}_{count}$	$\chi^2{}_{table}$
1,18989	5,9915

Based on the calculation, the value of $\chi^2{}_{count}$= 1.18989 is obtained. In the table of critical values, Chi-Square with a significant level of 5% and degrees of freedom = 2 obtained $\chi^2{}_{table}$ = 5.9915. It turns out that $\chi^2{}_{count}$= 1.18989 and $\chi^2{}_{table}$= 5.9915, as a result result $\chi^2{}_{count} < \chi^2{}_{table}$ then H$_0$ is accepted, which means that all three classes have a variance in the value of learning outcomes the same math (has a homogeneous variance).

The summary of the results of the research hypothesis test can be seen in Table 6.

Table 6. Summary of ANAVA Mathematical Learning Outcomes

Source of Variance	Number of Squares	df	Mean Squares	F_{count}
Treatment	2660,44	2	1330,222	
Error	9043,51	98	98,2807	13,5349
Total	11703,96	100		

Based on the results of the analysis carried out with a significant level of 5% and degrees of freedom = (2.98), then the value $F_{count} = 13,5349$ and $F_{0,05(2,98)} = 3,099$, as a result $F_{count} > F_{table}$ so H$_0$ is rejected. So, there are differences in the value of mathematics learning outcomes between students who use the Snowball Throwing cooperative learning model, the Group Investigation learning model, and the expository learning model.

The summary of the LSD test results of learning outcomes can be seen in Table 7.

Table 7. Summary of LSD Test Mathematical Learning Outcomes

Case	Comparison	LSD	$\|\bar{x}_i - \bar{x}_j\|$	The results
Case I	μ_1 vs μ_2	4,814	6,1227	H$_0$ is rejected
Case II	μ_1 vs μ_3	4,778	12,3529	H$_0$ is rejected
Case III	μ_2 vs μ_3	4,814	6,2302	H$_0$ is rejected

Based on the table seen in Case I because $|\bar{x}_1 - \bar{x}_2| = 6,13$ and LSD = 4,814, as a result $|\bar{x}_1 - \bar{x}_2| >$ LSD so H$_0$ is rejected. Because $\bar{x}_1 = 78,50$ and $\bar{x}_2 = 72,37$, as a result $\bar{x}_1 > \bar{x}_2$ means it $\mu_1 > \mu_2$. In Case II $|\bar{x}_1 - \bar{x}_3| = 12,36$ and LSD = 4,778, akibatnya $|\bar{x}_1 - \bar{x}_3| >$ LSD so H$_0$ is rejected. Because $\bar{x}_1 = 78,5$ and $\bar{x}_3 = 66,14$, as a result $\bar{x}_1 > \bar{x}_3$ means it $\mu_1 > \mu_3$, whereas in Case III $|\bar{x}_2 - \bar{x}_3| = 6,23$ and LSD = 4,814, as a result $|\bar{x}_2 - \bar{x}_3| >$ LSD so H$_0$ is rejected. Because $\bar{x}_2 = 72,37$ and $\bar{x}_3 = 66,14$, as a result $\bar{x}_2 > \bar{x}_3$ means it $\mu_2 > \mu_3$. So, the conclusion $\mu_1 > \mu_2 > \mu_3$.

CONCLUSION

1. There are differences in mathematics learning outcomes of students taught using the Snowball Throwing cooperative learning model, Group Investigation cooperative learning model and expository learning model in class VIII students of SMP Muhammadiyah 7 Yogyakarta in the odd semester of 2016/2017 school year.
2. Student mathematics learning outcomes taught using the Snowball Throwing cooperative learning model are better than learning using the Group Investigation type cooperative learning model and

expository learning model in class VIII students of SMP Muhammadiyah 7 Yogyakarta in the odd semester of 2016/2017 school year.

REFERENCES

Fathurrohman, Muhammad. 2015. *Model-Model Pembelajaran Inovatif*. Yogyakarta: Ar-Ruzz Media.

Sanjaya, Wina. 2006. *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Jakarta: Kencana Prenada Media.

Sugiyono. 2009. *Metode Penelitian Pendidikan (Pendekatann Kuantitatif, Kualitatif dan R&D)*. Bandung: Alfabeta.

Suprijono, Agus. 2011. *Cooperative Learning*. Yogyakarta: Pustaka Belajar.

Taniredja, T dkk. 2013. *Model-model Pembelajaran Inovatif dan Efektif*. Bandung: Alfabeta.

Uno, Hamzah, B. 2014. *Model Pembelajaran Menciptakan Proses Belajar Mengajar yang Kreatif dan Efektif*. Jakarta: Bumi Aksara.

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