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The Influence of the Snowball Throwing Learning Model on Pythagorean Theorem Material on Learning Outcomes

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ABSTRACT

Lack of understanding by students during teaching and learning activities is a problem experienced in learning. One of the causes is that the learning process is less effective in delivering learning, so student learning outcomes tend to be low. This study aimed to determine the effect of the snowball throwing learning model on Pythagorean theorem material on the mathematics learning outcomes of class VIII students at MTs Darul A'mal. The samples used in this research were classes VIII C and VIII D, each numbering 30 students. This type of research is a quasi-experimental quantitative research method (Quasi-Experimental Design) with one class as the experimental class and one as the control class. Data collection techniques include interviews, documentation, and tests (pre-test and post-test). Tests were conducted to determine student learning outcomes before and after using the snowball-throwing learning model. This study concluded that the snowball-throwing learning model affected student learning outcomes for class VIII MTs Darul A'mal Metro.

Keywords: Learning Model, Learning Outcomes, Snowball Throwing.

INTRODUCTION

Learning can be interpreted as an effort to influence someone's emotional, intellectual, and spiritual so that they want to learn with their own will (Drigas & Papoutsi, 2018; Gamage et al., 2021). Learning mathematics is one of the essential education lessons. Mathematics is a science that is constantly developing because of the demands of human needs for technology (Hansson, 2020). Therefore, mathematics is a subject taught at every level and type of education, according to the level of need (Esra, 2018; Grønmo, 2018; Laurens et al., 2017; Phuong Uyen et al., 2021). However, until now, students are still challenged to learn mathematics. This can be seen from the low interest and enthusiasm for learning students when they encounter mathematics.

The elements in learning are also referred to as components that influence each other's learning objectives, meaning there is relevance to the existing learning components to achieve the desired learning objectives. Learning components are a complete system that mutually supports each other. The learning component includes educational objectives, students, teaching materials, media, methods, and evaluation

(Bima & Barus, 2023; Lisnawati, 2018; Puspitarini & Hanif, 2019). In learning at school, sometimes a teacher is not precise in choosing the method to be used in learning, is not precise in identifying student learning problems, or is inaccurate in evaluating student work.

The learning process involves reciprocal interaction and communication activities between teachers and students in educative situations to achieve learning goals. In the learning process, teachers must be creative in developing learning models that will be used so that students can understand the material presented (Puspitarini & Hanif, 2019). The role of the teacher as an educator dramatically influences the ability and success of students (Zeng, 2023). A teacher is in charge of planning learning, carrying out learning activities, and providing an assessment of student learning outcomes.

The purpose of learning mathematics is an important thing that must be achieved in learning. Mathematics can also form a logical, critical, careful, disciplined, and creative attitude (Sellars et al., 2018; Wahyudi, 2020). Learning outcomes are often used to determine how far students have mastered the material that has been taught (Fitrianingtyas, 2017). Based on the results of an interview with one of the mathematics teachers who teach at MTs Darul A'mal, the learning media used for teaching are LKS and printed books, and the learning process still uses the question-and-answer discussion method. Many students at MTs Darul A'mal are less interested in learning mathematics because they think it is complex and there are too many formulas to memorize.

RESEARCH METHOD

This type of research is quantitative research. This study used the Quasi-Experimental Design method (pseudo-experimental research). The experimental research method determines the effect of an action or treatment deliberately carried out on a specific condition (Sanjaya, 2014). The design used in this study was the Nonequivalent Control Group Design, where the experimental and control groups were not randomly selected in this design (Creswell & Creswell, 2017). This research design uses two classes: one class as the experimental class and one as the control class.

The population in this study were all class VIII MTs Darul A'mal. The sample in this research was selected using a random sampling technique, so classes VIII C and VIII D were selected, each consisting of 30 students. In this research, there are two variables to be studied. The independent variable in this research is the snowball-throwing learning model, and the dependent variable is the learning outcomes.

RESULTS AND DISCUSSION

This quantitative research was conducted at MTs Darul A'mal Metro 2022/2023 Academic Year. The population in this study were all class VIII students at MTs Darul A'mal Metro, and the samples taken were class VIII C and VIII D. Class VIII C was the experimental class, and class VIII D was the control class, each class numbering 30. student. This research is experimental in which there is an effect on the mathematics

learning outcomes of class VIII students of MTs Darul A'mal Metro before and after carrying out the learning process using the snowball throwing learning model.

Obtained data on pre-test and post-test learning outcomes using the help of SPSS Version 16 with the following results:

Table 1. Descriptive of Learning Outcome Pre-Tes

	N	Minimum	Maximum	Means	Std. Deviation
Experiment Pre-test	30	45	100	67.00	14,300
Post-test Experiment	30	60	100	81.67	9,942
Control Pre-test	30	45	90	65.50	11,697
Post-test Control	30	50	100	76.00	11,700
Valid N (listwise)	30				

Based on the data above, the pre-test data was obtained for the minimum value of the experimental and control classes, namely, both obtaining a value of 45. The maximum value obtained by the experimental class is 100, and the control class is 90. Then, the average value of the experimental class is 67.00, while the average value of the control class is 65.50. The experimental class has a standard deviation of 14,300, while the control class has a standard deviation of 11,697. These data show that the experimental and control classes have the same minimum value, maximum value, and average value of the experimental class is higher than the control class.

The post-test data obtained the minimum value for the experimental class, namely 60, and for the control class, namely 50. The maximum value obtained by the experimental class and the control class was the same as 100. Then, the average value of the experimental class was 81.67. Meanwhile, the average score for the control class is 76.00. The experimental class has a standard deviation of 9,942. Meanwhile, the control class has a standard deviation of 11,700. These data show that the experimental and control classes have the same maximum value and minimum value, and the average value of the experimental class is higher than that of the control class.

Table 2. Descriptive of Learning Outcome Post -Tes

	Student Learning Model	N	Means	Std. Deviation	Std. Error Means
Student learning outcomes	Experiment Class	30	81.67	9,942	1,815
	Control Class	30	76.00	11,700	2,136

Table 3. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	Q	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Student learning outcomes	Equal variances assumed	.546	.463	2021	58	.048	5.667	2.803
	Equal variances are not assumed.			2021	56,528	.048	5.667	2.803

Based on the output above, it is known that the sig value for Levene's Test is 0.463. Because this value is 0.463 > 0.05, it can be concluded that the variance of the two data is homogeneous. Because Levene's Test results state that the two data are homogeneous, the t-count value in the first row is 2.021 with a Sig. (2-tailed) value of 0.048. The Sig (2-tailed) value is 0.048 < 0.05, so it can be concluded that Ho is rejected and Ha is accepted. It can be concluded that using the snowball throwing learning model on Pythagorean theorem material influences the learning outcomes of class VIII students at MTs Darul A'mal.

Based on the T-test results, t-count = 2.021 and t-table = 2.00 (at a significant level of 0.05 and DF = n_1+ n_2-2). Because t-count > t-table, Ho is rejected and Ha is accepted, so it can be concluded that there is an effect of using the snowball throwing learning model on the Pythagorean theorems material on student learning outcomes in class VIII MTs Darul A'mal.

The snowball-throwing learning model influences student motivation and learning outcomes (Irawahyuni et al., 2021; Ningsih et al., 2020; Sagala & Hasibuan, 2023). In the learning process, motivation can be said to be the overall driving force within students, which gives rise to learning activities, namely ensuring the continuity of learning activities and providing direction to learning activities so that the goals desired by the learning subject can be achieved.

Snowball-throwing also trains students to be more responsive in conveying information to their friends in a group. Students must also be good listeners to convey the message as it should (Sipayung et al., 2021; Syahputra, 2020). This message is in the form of useful learning material for students. In implementing the Snowball Throwing learning model at MTs Darul A'mal, all students are actively involved in learning and increase individual responsibility in group discussions. Learning that uses the snowball-throwing learning model shows the influence of students' mathematics learning outcomes. Factors that influence learning outcomes are influenced by two main factors: those from within the student himself or internal factors and those from outside the student or external factors. If student learning outcomes are high, this is influenced by students' motivation during learning. Theoretically, the higher the student's learning motivation, the higher the student's learning outcomes.

This research is also in line with research conducted by (Manurung et al., 2019; Mazidah et al., 2023; Nurfitri, 2020), that implementing the snowball-throwing learning model can support student success in learning. Through the snowball-throwing learning model, students can discuss well and responsively and create a pleasant learning atmosphere so that students are motivated to learn. Using the snowball-throwing learning model can provide a way to overcome the problem of learning outcomes. This is evident from the cognitive learning outcomes tests given to students in the experimental and control classes. From the final test given to the two sample classes, the results showed that the average score of the experimental class students was higher than that of the control class.

Look at the use of the snowball-throwing learning model. The advantages are that it encourages students to think actively and discuss with friends, creating a fun learning atmosphere because using the snowball-throwing model allows students to learn while playing (Iqbal Saputra & Munadi, 2019; Irawahyuni et al., 2021; Ningsih et al., 2020). In addition, the teacher provides opportunities for students to ask questions so they can answer these questions. Differences of opinion between students can be taken in a middle way; questions that are interesting and direct students' attention can prevent

drowsiness, can review material previously discussed, students become brave, and can hone their mastery in answering and expressing opinions.

During the learning process, there were several obstacles during the use of the snowball-throwing learning model in the learning process; namely, not all questions could be answered by students due to time constraints. In addition, some students are still not confident when answering the teacher's questions. Another obstacle is that the assignments given to students cannot be carried out continuously because they can affect students' psychological condition so that they can experience learning difficulties.

CONCLUSIONS

Based on the results of the data analysis, it was obtained that the average pre-test data for the experimental class was 67.00, while the average value for the control class was 65.50. At the same time, the average value of the control class is 76.00. It can be concluded that using the snowball-throwing learning model on the Pythagorean theorem material affects student learning outcomes in class VIII MTs Darul A'mal. Based on the description above, it can be concluded that the snowball-throwing learning model can influence the learning outcomes of class VIII students of MTs Darul A'mal in the Pythagorean theorem material. It can be concluded that the accepted hypothesis is that the snowball-throwing learning model based on the Pythagorean theorem material has a significant effect on the learning outcomes of class VIII students at MTs Darul A'mal.

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