

Comparison of Mathematics Learning Outcomes Based on Outdoor Learning Model

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ARTICLE INFO	ABSTRACT
Keywords: Outdoor learning; learning outcomes; mathematics	Outdoor learning is learning that takes place outside the classroom and utilizes the environment as a learning resource. In learning mathematics, we can take advantage of the existence of objects around us in order to better understand the material of geometric nets. The aims of this study were to find out: 1) the learning outcomes of fifth grade students before using the outdoor learning model 2) the learning outcomes of fifth grade students after using the outdoor learning model and 3) differences in learning outcomes mathematics of fifth grade students between before and after using the outdoor learning model. This study used a comparative quantitative research method with 20 research subjects. Data were analyzed using the mean and standard deviation then proceed with the paired sample t test. The results of this study indicate that: 1) the learning outcomes of fifth grade students before using the outdoor learning model are included in the medium category, 2) the learning outcomes of fifth grade students after using the outdoor learning model are included in the medium category and 3) there were differences in the learning outcomes of fifth grade students between before and after using the outdoor learning model.
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INTRODUCTION

Learning is a process that is carried out by a person to obtain a new change in behavior as a whole, as a result of his own experience in interaction with his environment (Slameto, 2015). Learning can also be interpreted as an effort to achieve a certain goal, namely to get a change in behavior. Changes in behavior can occur as a result of experience, practice or training and individual interaction with the environment, these changes must take place consciously (Hidayati, 2019). In order for the changes experienced by students to occur consciously, students must be involved in learning activities. Learning activities can also be interpreted as individual interactions with the environment. The environment in this case are other objects that allow individuals to gain experience or knowledge, either new experience or knowledge or something that was previously obtained but raises attention again for the individual so as to allow interaction (Ainurrahman, 2013).

After going through all the learning process activities, students will have new abilities called learning outcomes. Learning outcomes are abilities possessed by students after receiving their learning experience (Mustaqim & Wahab, 2010). Learning outcomes can also be interpreted as the achievement of educational goals for students who take part in learning (Hikmah, 2022).

Unfortunately, the mathematics learning outcomes of students in Indonesia are still below average. This can be seen from the results of the implementation of PISA. PISA (Program for International Student Assessment) is an international level assessment study conducted by the Organization for Economic Co-operation and Development to evaluate the world's education system by measuring the academic performance of 15-year-old school students in the fields of mathematics, science, and reading ability (Habibi & Suparman, 2020). In the last PISA results held in 2018, Indonesia was in 72nd position out of 78 countries (Syafitri et al, 2023). This shows that the math skills of Indonesian students are in the bottom 10 positions.

Low mathematical ability is influenced by internal and external factors (Oktaviani, 2020). One of the causes of low student learning outcomes in mathematics is the model for presenting subject matter (Avriana, Syahrilfuddin & Antosa, 2020). Another obstacle is the delivery of learning material that is less interesting, monotonous and boring so that it becomes a problem for students in completing their assignments (Rosanti & Harahap). To overcome these problems, teachers must be wise in determining an appropriate learning model so as to create conducive situations and conditions so that the teaching and learning

process can take place in accordance with the expected goals (Nabillah & Abadi, 2019).

Researchers also encountered low mathematics learning outcomes when conducting interviews in February 2023 with the fifth grade teacher at SDN Simo 1 Ngawi who said that the average score for learning mathematics was only 55.5. This value is below the KKM score for mathematics, which is 70. Of the 20 students, only 30% achieved the KKM score (Sulastri, 2023). Other facts were also obtained by the researchers when they made observations in the same month in class V at SDN Simo 1 Ngawi. At the time of learning the teacher who seemed to be active explained, only a small number of students were active, the rest were mostly passive students, there were some students who talked with their friends and some who seemed less interested in learning mathematics. One of the causes is the saturation of students when carrying out learning in the classroom, because students have never done learning outside the classroom.

Based on Piaget's stage of intellectual development, fifth grade elementary school students are in the operational stage of concrete thinking because their logical thinking is based on physical manipulation and objects (Hidayati, 2012). With the interaction with objects can significantly increase student activity. One learning model that involves student activity is to use outdoor learning. Outdoor learning is an activity outside the classroom that makes learning interesting and fun and can be done anywhere by emphasizing the learning process based on real facts through learning materials that are experienced directly by students through direct learning activities with the hope that students will further develop meaning and impressions. in his long-term memory (Nur, Nandu & Nasrah, 2023). In outdoor learning students carry out activities that can lead them to observe the surrounding environment, according to the material being taught (Cintami & Mukminan, 2018).

As an alternative learning, outdoor learning has benefits including (1) clearer mind, (2) learning will be fun, (3) learning is more varied, (4) learning is more recreational, (5) learning is more real, (6) children more familiar with the real and wider world, (7) an embedded image that the world is a class, (8) the vehicle for learning will be wider and (9) the brain works more relaxed (Husamah, 2013). Based on the benefits above, many teachers are starting to apply the outdoor learning model, because the implementation of the outdoor learning model can improve student learning processes and outcomes (Pasinggi, Maryam & Mursyida, 2023).

The outdoor learning model is in great demand by teachers because it has several advantages, such as (1) learning activities are more interesting and not boring, (2) the nature

of learning will be more meaningful because students are faced with actual or natural situations and conditions, (3) materials things that can be learned are richer and more factual, (4) student learning activities are more comprehensive and more active because they can be done in various ways such as observing, asking or interviewing, proving or demonstrating, testing facts, (5) learning resources are richer because the environment what can be learned can be as diverse as the social environment, the natural environment, the artificial environment and (6) students can understand and appreciate the aspects of life in their environment, so that they can form individuals who are familiar with the life around them, and can cultivate a love for the environment (Husama, 2013)

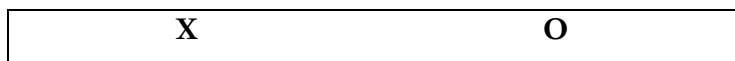
Behind the existing advantages, outdoor learning also has weaknesses, namely (1) students will lack concentration, (2) student management will be more difficult to condition, (3) time will be consumed (not timely), (4) reinforcement of concepts is sometimes contaminated by other students or other groups, (5) the teacher is more intensive in guiding and (6) pseudo-interest will appear (Husamah, 2013).

Based on the explanation of the data above, the researcher is interested in examining learning outcomes before using the outdoor learning model, learning outcomes after using the outdoor learning model and whether there are differences in learning outcomes between before and after using the outdoor learning model in fifth grade students at SDN Simo 1 Ngawi. This research is only limited to the use of outdoor learning models that are applied to learning mathematics on the material of nets of cubes and blocks.

RESEARCH METHOD

This research is in the form of quantitative with experimental methods. The experimental design used is a pre-experimental design, because there are still external variables that influence the formation of the dependent variable. So the experimental results which are the dependent variable are not solely influenced by the independent variable. This can happen because there is no control variable and the sample is not randomly selected. The pre-experimental design used is a one-shot case study, where a group is given a treatment and the results are then observed (Sugiyono, 2012). In this study, the independent variable is the outdoor learning model which is given as a treatment to research subjects. While the dependent variable is student learning outcomes.

Table 1 Research Design



Information

X : outdoor learning model

O : learning outcomes

The population in this study were 20 grade V students at SDN 1 Simo Ngawi. All of these students were used as research samples using non-probability sampling techniques using saturated sampling, namely all members of the population were used as samples. This is done because the population is relatively small (Sugiyono, 2017).

This outdoor learning model is carried out through stages, namely (1) preparation, (2) implementation and (3) follow-up (Husamah, 2013). At the preparatory stage the teacher determines the material discussed in mathematics learning, namely regarding cube nets and blocks. Then the place used for learning, namely the environment around the school. At the implementation stage students are invited to several places such as the library, teacher's room and school canteen. There students are asked to observe objects in the form of cubes and blocks. There are several objects that can be dissected so that you can see the shape of the nets, such as cake boxes and cardboard packaging for various products. There are also objects that can only be observed such as cupboards and tins of biscuits. Finally, at the follow-up stage, the teacher and students discuss the results obtained from visits to several places in the school environment and conclude that the material obtained is then linked to the material in the book.

Data collection techniques using tests given to 20 students as research subjects. Then the data were analyzed using the calculation of the average value and standard deviation then continued with the sample pair t test which had previously been tested for normality and homogeneity.

RESULT AND DISCUSSION

Based on the results of research on the mathematics learning outcomes of fifth grade students at SDN Simo 1 Ngawi, the following data are obtained:

Table 2. Mathematics Learning Outcomes of Grade V Students at SDN 1 Simo Ngawi Before Using the Outdoor Learning Model

Minimum Value	40
Maximum Value	80

N	20
Mean	55,5
Standard Deviation	12,44

Based on the data in table 2 taken from 20 students, it is known that the mathematics learning outcomes of fifth grade students at SDN 1 Simo 1 Ngawi before using the outdoor learning model have a minimum score of 40, a maximum score of 80 with an average score of 55.5 and a standard deviation 12.44. Then each of these data is classified into 3 categories, namely high, medium and low categories. For the categorization of learning outcomes before using the outdoor learning model can be seen in the following table:

Table 3 Categorization of Mathematics Learning Outcomes Before Using the Outdoor Learning Model

Category	Score	Frequency	Percentage
High	> 67,94	6	30 %
Medium	43,06 – 67,94	9	45 %
Low	< 43,06	5	25 %
Total		20	100 %

Based on the data in table 3, it is known that the mathematics learning outcomes of class V students at SDN 1 Simo Ngawi before using the outdoor learning model are the high category with a score of > 67.94 as many as 6 people (30%), the medium category with a value of 43.06 – 67, 94 as many as 9 people (45%) in the low category with a value <43.06 as many as 5 people (25%). The data if graphed looks like in the following figure:

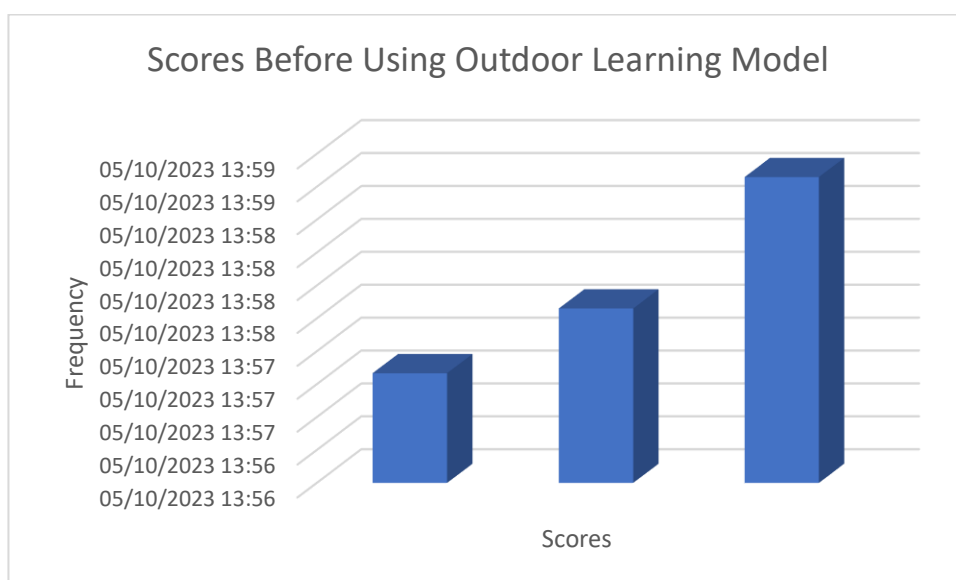


Figure 1. Mathematics Learning Outcomes of Grade V Students at SDN 1 Simo Ngawi Before Using the Outdoor Learning Model

Based on the results of research on the mathematics learning outcomes of fifth grade students at SDN Simo 1 Ngawi after using the outdoor learning model, the following data were obtained:

Table 2. Mathematics Learning Outcomes of Grade V Students at SDN 1 Simo Ngawi After Using the Outdoor Learning Model

Minimum Value	60
Maximum Value	100
N	20
Mean	80,5
Standard Deviation	9,206

Based on the data in table 4 taken from 20 students, it is known that the mathematics learning outcomes of fifth grade students at SDN 1 Simo 1 Ngawi after using the outdoor learning model have a minimum score of 60, a maximum score of 100 with an average score of 80.5 and a standard deviation 9.206. Then each of these data is classified into 3 categories, namely high, medium and low categories. For the categorization of mathematics learning outcomes after using the outdoor learning model can be seen in the following table:

Table 5 Categorization of Mathematics Learning Outcomes After Using the Outdoor Learning Model

Category	Score	Frequency	Percentage
High	> 89,71	5	25 %
Medium	71,29 – 89,71	12	60 %
Low	< 71,29	3	15 %
Total		20	100 %

Based on the data in table 5, it is known that the mathematics learning outcomes of class V students at SDN 1 Simo Ngawi after using the outdoor learning model are the high category with a score of > 89.71 for 5 people (25%), the medium category with a value of 71.29 – 89, 71 as many as 12 people (60%) and low category with a value <71.29 as many as 3 people (15%). The data if graphed looks like in the following figure:

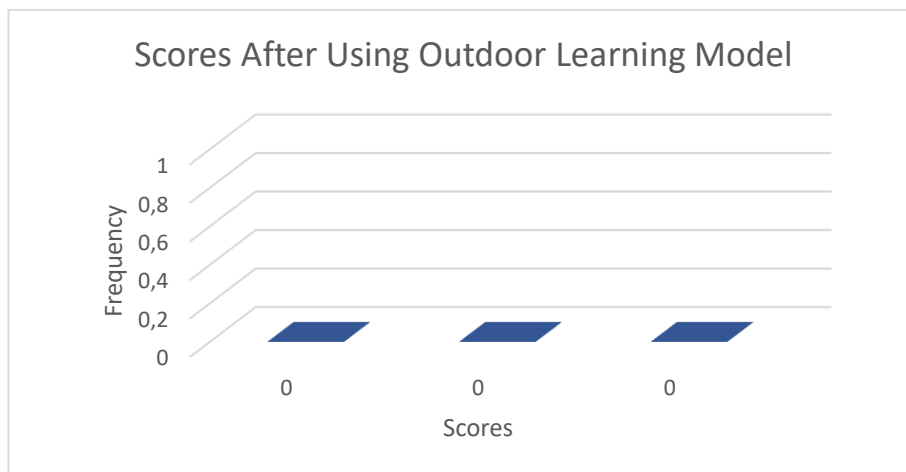


Figure 1. Mathematics Learning Outcomes of Grade V Students at SDN 1 Simo Ngawi After Using the Outdoor Learning Model

Based on the data presentation, there was an increase in the value of mathematics learning outcomes between before and after using the outdoor learning model, namely the minimum score increased from 40 to 60, the maximum value increased from 80 to 100; the mean score increased from 55.5 to 80.5. This is in accordance with the research by Badriyana, Maidiyah & Zubaidah (2023) which shows that learning outcomes have increased, namely mathematics learning outcomes between before and after using the outdoor learning model with the acquisition of a minimum score increasing from 15 to 40, the maximum score increasing from 75 to 85; the average score increased from 45.65 to 65.46. Another study conducted by Hikmah (2022) also stated that there was an increase in students' mathematics learning outcomes after using the outdoor study method.

From the two data on the results of learning mathematics before and after using the outdoor learning model then it is compared using the independent sample t test at a significance level of 5%. From the test results obtained $t_{\text{count}} = 10.162$ and $t_{\text{table}} = 2.093$. Based on these values it is known that $t_{\text{count}} > t_{\text{table}}$, there is a significant difference in learning outcomes between before and after using the outdoor learning model. This difference is due to the treatment of outdoor learning, this is in accordance with the results of Hikmah, Prayitno & Damayanti's research (2020) which states that the application of outdoor mathematics learning is one way to improve student learning outcomes to achieve the expected competencies.

CONCLUSION

The conclusion of this research is (1) the learning outcomes of fifth grade students

before using the outdoor learning model at SDN Simo 1 Ngawi, namely 6 students with a score of $> 67,94$ are included in the high category, 9 students with a score of $43,06 - 67,94$ are included in the medium category and 5 people with a score of $< 43,06$ are in the low category, (2) the learning outcomes of fifth grade students after using the outdoor learning model at SDN Simo 1 Ngawi, namely 5 people with a score of $> 89,71$ are in the high category, 12 people with a score of $71,29 - 89,71$ included in the medium category and 3 people with a score $< 71,29$ included in the low category and (3) there were differences in the learning outcomes of fifth grade students between before and after using the outdoor learning model at SDN Simo 1 Ngawi with $t_{count} = 10,162$ and $t_{table} = 2,093$ at a significance level of 5%.

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