

The Effect of Using Discovery Learning-Based Mathematics Learning Modules on Students' Interest in Learning Mathematics

Muhammad Habib Ramadhani¹, Kartono², Sri Haryani³

¹Primary Education, ²Mathematics Education, ³Chemistry Education,
Postgraduate School, Semarang State University, Semarang City, Indonesia

Corresponding Author: Muhammad Habib Ramadhani

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ABSTRACT

The purpose of this study was to analyze the effectiveness of the discovery learning-based mathematics learning module in terms of students' interest in learning mathematics. This type of research is quasi-experimental. The research design used was the One Group Pretest-Posttest Design. The research was conducted in class V SDN Ngijo 02 Gunungpati District, Semarang City. The number of students in the class is 28 students. The instrument used in the study was a questionnaire of interest in learning mathematics. Data analysis techniques used parametric statistical tests t-test and N-Gain. The statistical test results showed that the significance value was 0.00, meaning that the average score of students' learning interest after using the discovery learning model-based mathematics learning module was higher than the average score of students' learning interest before using the discovery learning model-based mathematics learning module. The average interest in learning mathematics in class V at SDN Ngijo 02 experienced an n-gain increase of 0.45 with the "medium" criterion. Thus, it can be concluded that the use of discovery learning model-based mathematics learning modules in learning has proven to be effective in increasing interest in learning mathematics for fifth-grade students at SDN Ngijo 02.

Keywords: learning modules, mathematics, discovery learning, interest in learning

INTRODUCTION

Education has an influence on the development of a country. A good education will affect the achievement of an advancement in a country's technology. Therefore, serious attention is needed to education in order to keep up with the times. One of the 21st century skills is mathematical problem solving skills (Rahman, 2019; Farikh & Haryani, 2022).

However, the reality on the ground shows that problem-solving skills in an elementary school in Semarang are still low. also found the fact that students' interest in learning mathematics is low (Ramadhani et al., 2023). Researchers believe that the low interest in learning has an effect on low mathematical problem solving skills. Based on research conducted by Agustin & Hartanto (2018); Nisrina (2020); Komariyah et al. (2018); Brahmsyah (2021); Yuliati (2021); Anggraini et al. (2022); Maulina (2022); and (Utomo et al., 2021) show that there is an influence of interest in learning on mathematical problem-solving skills. This is enough reason that improving students' mathematical problem-solving skills cannot be separated from aspects of student interest in learning. Therefore, increasing students' interest in learning mathematics needs to be a serious concern in order to achieve the goals of learning mathematics.

Based on some of these facts, it is necessary to find a solution to overcome these

problems. The solution can be in the form of using learning media or teaching materials that can support the implementation of learning. Research conducted by Puspita et al, (2014); Hadiya et al. (2015); Kholisho (2017); Ibrahim & Yusuf (2019); Pujiastuti et al. (2021); Utami et al. (2021); and Kusuma (2022) show that the developed module can increase students' interest in learning. This proves that it is necessary to use teaching materials such as learning modules to support the implementation of learning.

Learning modules can be designed in such a way as to support the implementation of learning. One of them is integrating learning modules with discovery learning models. According to Karlina & Anugraheni (2021) the discovery learning model invites students to be more active and creative in participating in the learning process, so students don't feel bored in learning. Karlina & Anugraheni (2021) also added that students will be more enthusiastic about participating in the learning process in class because discovery activities while participating in the learning process are activities where students will gain memorable experiences.

Based on the background and some relevant research, it is necessary to study the effectiveness of the mathematics learning module which is integrated with the discovery learning model in the material "Build Space (Cubes and Blocks)" for fifth grade elementary school students. Thus, the purpose of this study was to analyze the effectiveness of the discovery learning-based mathematics learning module in terms of students' interest in learning mathematics.

METHODS

This type of research is quasi-experimental. This method can be used to compare conditions before and after using the new system Sugiyono (2013). The research was conducted in class V SDN Ngijo 02 Gunungpati District, Semarang City. The number of students in the class is 28 students. The study consisted of 2 evaluations of learning interest and 3 learning meetings. The research design used by One Group Pretest-Posttest Design was adopted from Sugiyono (2013). The design of this study is shown in Figure 1.

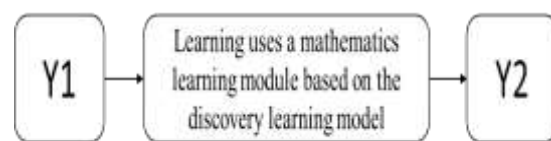


Figure 1 One Group Pretest-Posttest Design

Informations:

Y1 = given a questionnaire of students' early learning interest in the experimental class

Y2 = given a final student interest questionnaire in the experimental class

The instrument used in the study was a questionnaire of interest in learning mathematics. The questionnaire sheet was used in the experimental class and control class before treatment and after carrying out learning using the discovery learning-based mathematics learning module. The grid used in this study was compiled based on 4 indicators of interest in learning from (Slameto, 2015) and Lestari & Yudhanegara (2017: 93).

Table 1. Grid of Interest in Learning Mathematics Questionnaire

Indicators	Informations	Amount of items
Feeling happy	Willingness to learn without coercion	4
	Passion for learning or optimism	4
Student Engagement	Activeness during math lessons	4
Interest	Enthusiastic when following math lessons	2
	Student response to the assignment given	2
	Curiosity towards math lessons	2
Attention Students	Student attention while following math lessons in class	2

Data analysis was taken from the results of student response questionnaires before

carrying out learning using the mathematics learning module based on the discovery

learning model. Furthermore, the results of the questionnaire data were analyzed using the parametric statistical test t test. Furthermore, to find the level of effectiveness, this study uses the N-Gain index. The formula used according to Lestari & Yudhanegara (2017) is as follows.

$$N - Gain = \frac{Posttest\ score - Pretest\ score}{Max\ score - Pretest\ score}$$

Furthermore, the results of calculating the average N-Gain are interpreted using the following criteria.

Table 3. Average Similarity Test of Interest in Learning Mathematics Data

Statistic Test		Significance Value	Information
Normality test	Before	0,882	<i>Sig</i> > 0,05, data is normal
	After	0,129	<i>Sig</i> > 0,05, data is normal
T-Test		0,00	<i>Sig</i> < 0,05, there is a difference

Based on Table 3 it can be seen that the data on interest in learning mathematics in class V at SDN Ngijo 02 is normal, so the statistical test uses the parametric T-test. The statistical test results show that the significance value is 0.00. This means that Ho is rejected, so it can be concluded that the average score of students' interest in learning after using the discovery learning model-based mathematics learning module is higher than the average

Table 2 Criteria for the N-gain Value

N-Gain Value	Criteria
0,70 - 1	high
0,31 - 0,69	medium
0 - 0,30	Low

(Source: Lestari & Yudhanegara, 2017)

RESULT

Based on the research that has been done, the data obtained from the interest in learning mathematics for fifth-grade students are as follows.

score of students' learning interest before using the discovery learning model-based mathematics learning module.

Furthermore, to find out the criteria for increasing students' interest in learning mathematics after using the mathematics learning module based on the discovery learning model was analyzed using the n-gain test. The results of the n-gain test analysis obtained the following data.

Table 4 N-Gain Test Data of Interest in Learning Mathematics

Data of Interest in Learning	Amount Of Students	Ideal Max Score	Average N-Gain Index	Criteria
Before	28	100	0,47	Medium
After	28	100		

Based on Table 4 it can be seen that the average data on interest in learning mathematics in class V SDN Ngijo 02 has increased n-gain by 0.45 with the "medium" criterion. This shows that student's interest in learning has increased after using the mathematics learning module based on the discovery learning model.

DISCUSSION

Based on statistical tests on data on students' interest in learning mathematics, it was found that the use of mathematics learning modules based on the discovery learning model in learning proved to be effective in increasing

interest in learning mathematics for fifth-grade students at SDN Ngijo 02. The increase in student learning interest occurred because of students' curiosity when presented with a problem. Students feel challenged to solve problems. The pessimistic attitude of students can be anticipated with the guide steps contained in the module. So that it is enough to help students in solving problems. Based on the four indicators of interest in learning used, indicators of feeling happy and indicators of interest have increased quite highly. The increase in these indicators specifically occurred in the aspects of willingness to learn without coercion,

enthusiasm for learning, and aspects of curiosity.

Findings in the field during three learning meetings showed that when students held group discussions using the developed learning modules, students were able to work together with their groups and were able to explain the material they understood to their friends in the group. Some students have confidence in their skills, but some have a distrust of the skills they have. This negative view can turn into a positive one when students and their groups feel they have been able to solve problems well. When students can solve a problem in a learning module, students feel addicted and want to solve other problems. This addiction fosters students' enthusiasm for learning mathematics. Thus, the content designed in the learning module can increase students' interest in learning mathematics.

Based on the results of statistical tests on student learning interest questionnaire data, shows that there are differences in student learning interest scores before and after carrying out learning using the developed learning modules. There is an increase in learning interest after students learn to use the discovery learning-based mathematics learning module. This fact is in line with research conducted by Puspita et al, (2014); Hadiya et al. (2015); Kholisho (2017); Ibrahim & Yusuf (2019); Pujiastuti et al. (2021); Utami et al. (2021); and Kusuma (2022) which shows that learning modules can increase students' interest in learning.

CONCLUSION

Based on the results and discussion, it can be concluded that the mathematics learning module based on the discovery learning model is effective in increasing the learning interest of fifth-grade elementary school students. This is indicated by the significant level of the average similarity test result of 0.00 and the N-Gain test result of 0.47 with the criteria of "medium" or "sufficient." The mathematics learning module based on the discovery learning model has been proven effective in increasing students' interest in

learning mathematics so it can be used as an alternative to learning mathematics.

Declaration by Authors

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