


The Influence of Learning Interest on Understanding of Mathematical Concepts in Class XI PH 1 Students at SMKN 6

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 <https://doi.org/10.30595/alphamath.v10i1.19705>

ABSTRACT

This study aims to determine the effect of learning interest on understanding of mathematical concepts in class XI PH 1 students at SMKN 6 Padang. Research subjects were selected using purposive sampling with a total of 26 students. The approach used in this research is quantitative and analyzed by simple linear regression using the R program. The technique of collecting data by providing non-test instruments in the form of questionnaires on students' learning interests and test instruments about number patterns to measure understanding of mathematical concepts. Hypothesis testing is done by simple regression, by first looking at the pattern of relationships between variables and determining the correlation coefficient. The result showed that there is no significant effect of learning interest on understanding mathematical concepts with regression equation $Y=35.3555+0.3379X$. So, it can be concluded that learning interest has no significant effect on students' ability to understand mathematical concepts.

Keywords: Learning interest, regression, understanding of mathematical concept

ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh minat belajar terhadap pemahaman konsep matematika siswa kelas XI PH 1 SMKN 6 Padang. Subyek penelitian dipilih menggunakan purposive sampling dengan jumlah 26 siswa. Pendekatan yang digunakan dalam penelitian ini adalah kuantitatif dan dianalisis dengan regresi linier sederhana menggunakan program R. Teknik pengumpulan data dengan memberikan instrumen non tes berupa angket minat belajar siswa dan instrumen tes tentang Transformasi Geometri untuk mengukur pemahaman konsep matematika. Pengujian hipotesis dilakukan dengan regresi sederhana, dengan terlebih dahulu melihat pola hubungan antar variabel dan menentukan koefisien korelasinya. Hasil penelitian menunjukkan bahwa tidak terdapat pengaruh yang signifikan minat belajar terhadap pemahaman konsep matematika dengan persamaan regresi $Y=35.3555+0.3379X$. Jadi, dapat disimpulkan bahwa minat belajar tidak berpengaruh signifikan terhadap kemampuan pemahaman konsep matematika siswa.

Kata kunci: Minat belajar, pemahaman konsep matematis, regresi

Received : November 3, 2023

Accepted : May 4, 2024

Published : May 4, 2024

Introduction

Mathematics is a universal science that strengthens human thinking, underlies increasingly advanced technology, and is important in many other fields (Chairani, 2016; Gravemeijer et al., 2017). The importance of mathematics as a foundation of knowledge is demonstrated by the high standards that must be met in terms of mathematical abilities. Students must develop their mathematical skills to succeed in

math class (Fitrianingrum & Basir, 2020). One of the abilities that is very necessary in mathematics is understanding concepts (Kariman et al., 2019). Seeing the importance of mathematics, mathematics should be a favorite subject so that students will be interested in studying mathematics.

Interest is a feeling of liking and being interested in something or an activity without anyone telling you to (Friantini & Winata, 2019). When a student wants to improve their understanding of a subject and can do so, it is said that they have a student interest in learning (Luju et al., 2020). If a student shows interest or liking for a topic, then he or she tends to enjoy the learning process more and has a greater chance of successfully studying it, especially in mathematics subjects (Sodiq & Trisniawati, 2020). Correspondingly, subject matter that interests' students is easier to memorize and convey, because interest increases learning activities (Prastika, 2020; Asyaari, 2023). There was a study on the impact of students' learning interests on students' process skills in mathematics (Syaiful et al., 2021). The result of Syaiful's study is that student interest significantly influences the process skills of students in Madrasah Tsanawiyah schools, particularly about mathematics with flat side space material.

Understanding concepts is an important phase in learning mathematics since it forms the foundation in which to deal with both mathematical problems and everyday life (Febriantika, 2019). Conceptual understanding shows that students can express partially and completely in their mother tongue their understanding of the topic they are studying (Effendi, 2017). Students must first comprehend the concepts that are a prerequisite for the material to understand a mathematical idea since understanding concepts will serve as a basis for the formation of new knowledge and aid students in managing more challenging issues (Yusri, 2017; Yeh et al., 2019). From several reasons stated above, it can be concluded that understanding concepts is the basis for learning. Students will find it easier to participate in further learning if they have a strong understanding of mathematical concepts.

In interviews conducted with mathematics subject teachers and several students in class XI PH 1 SMKN 6, information was obtained that there were still many students who did not understand the learning material, especially mathematics. This is caused by students' lack of enthusiasm for learning which causes them not to like or be interested in studying mathematics which causes them to lack understanding of mathematical concepts. Based on the information above, research was conducted that aimed to determine the affect of learning interest on understanding of mathematical concepts in class XI students at SMKN 6 Padang.

Research Methods

This study uses a quantitative correlational research design to examine the relationship between learning interest and understanding of mathematical concepts among students of class XI PH 1 at SMKN 6 Padang. Correlational research is research that is intended to determine whether there is a relationship between two or several variables (Arikunto, 2014). There are two variables in this research, namely variables X and Y. Variable X is learning interest, and variable Y is understanding of mathematical concepts. Research subjects were selected using purposive sampling with a total of 26 students. The purposive technique was chosen because purposive sampling is used if the target sample has certain characteristics, in this research, the same Mathematics teachers. This research was conducted on 16-23 February 2022. Data collection techniques in this research used questionnaire methods and tests. The questionnaire method was used to collect data on the independent variable, namely learning interest, and test for the dependent variable, namely understanding of mathematical concepts. The questionnaire contains information regarding learning interests which consists of 20 statements and a test containing descriptive questions which contains 4 questions for students of class XI PH 1 at SMKN 6 Padang. [Table 1](#) contains a grid of learning interest questionnaire items and [Table 2](#) contains a grid of concept understanding tests.

Table 1. Grid of Learning Interest Instrument

Indicator Variable	Number	Question Point		Number of Questions
		(+)	(-)	
Learning Interest	Feeling happy	1,3	2	3
	Student interest	4,7,9	5,6,8	6
	Student engagement	10,13	11,12	4
	Study diligently and work diligently on math assignments	14	15,16	3
	Be persistent and disciplined in studying and have a study schedule	17,19,20	18	4
Total				20

Source: Modification (Hendriana et al., 2017)

Table 2. Grid of concept understanding tests

Basic competencies	Material Indicators	Indicators of Student Concept Understanding	Question Number	Weight	Scale	Score
Determining contextual	1. Determine the translation	1. Restate a concept	1	2	3	6

Basic competencies	Material Indicators	Indicators of Student Concept Understanding	Question Number	Weight	Scale	Score
problems related to geometric transformations	results on a flat shape	2. Presenting concepts in various forms of mathematical representation		3	3	9
		1. Restate a concept		2	3	6
	2. Determine the reflection results on a flat plane	2. Apply concepts or algorithms to problem-solving	2	3	3	9
		1. Restate a concept		2	3	6
	3. Determine the results of rotation on a flat plane	2. Presenting concepts in various forms of mathematical representation	3	3	3	9
		1. Restate a concept		2	3	6
	4. Determines the result of dilation of an object	2. Presenting concepts in various forms of mathematical representation	4	3	3	9

Source : Modification (Hermaini & Nurdin, 2020)

Using the R program, the data that has been collected is analyzed.

Result and Discussions

The learning interest questionnaire was distributed to 26 students. The results of data collection using a scale are then tabulated and the total score is calculated. The minimum score obtained in this study was 45 and the maximum score was 99. In the learning interest variable, the mean was 77 and the standard deviation was 13. Meanwhile, for the concept understanding test, the minimum score was 25, the maximum score was 95, the mean was 69 and the standard deviation was 15.

After obtaining the scores for interest in learning and understanding of concepts, the pattern of the relationship between these two variables was then examined. The scatter

plot of learning interest and understanding of concepts can be seen in [Figure 1](#), and the correlation coefficient of learning interest and concept understanding variables in [Figure 2](#).

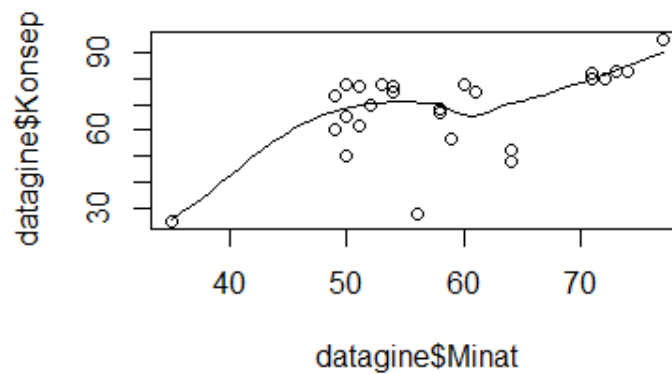


Figure 1. Scatter plot of learning interest and understanding of concepts

Based on the scatter plot in [Figure 1](#), there is a linear relationship between Learning Interest and Concept Understanding. The relationship that occurs is a positive relationship with a correlation coefficient of 0.5576966 ([Figure 2](#)), which means that learning interest increases as understanding of the concept increases.

	MinatBelajar	PemahamanKonsep
MinatBelajar	1.0000000	0.5576966
PemahamanKonsep	0.5576966	1.0000000

Figure 2. The correlation coefficient of learning interest and concept understanding variables

Next, carry out a simple regression test using the `lm()` function and `summary()` function to see the results of the regression test ([Figure 3](#)).

```
model<- lm(MinatBelajar~PemahamanKonsep, data = datagine)
summary(model)
```

Figure 3. The `lm()` Function and `Summary()` Function

The output after execution can be seen in [Figure 4](#)

```
Call:
lm(formula = MinatBelajar ~ PemahamanKonsep, data = datagine)

Residuals:
    Min       1Q   Median       3Q      Max
-11.713  -7.242  -1.023   9.310  12.425

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   35.3555     7.1711   4.930 4.96e-05 ***
PemahamanKonsep  0.3379     0.1027   3.292  0.00307 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 8.535 on 24 degrees of freedom
Multiple R-squared:  0.311,    Adjusted R-squared:  0.2823
F-statistic: 10.83 on 1 and 24 DF,  p-value: 0.003075
```

Figure 4. Output of syntax

Based on the output in [Figure 4](#), several interpretations can be made as follows.

Regression Equations

Obtained a regression equation that shows a linear relationship between the variables Conceptual Understanding (Y) and Interest in Learning (X). Here's the regression equation:

$$Y = 35.3555 + 0.3379X \quad (1)$$

[Equation 1](#) shows the positive influence of the learning interest variable on concept understanding. The estimator value β_1 or its slope is 0.3379, indicating that for every one-unit increase in learning interest, the concept understanding score will increase by 0.3379. Meanwhile, the estimator value β_0 or intercept of 35.3555 can be interpreted as an average understanding of concepts if there is no learning interest.

Partial Test

This test is used to see the significance of the influence of each parameter estimator on the regression model.

- a) A partial test of the constant β_0

The hypothesis is as follows:

$H_0: \beta_0 = 0$ (The intercept is not significant in the regression model)

$H_1: \beta_0 \neq 0$ (The intercept is significant in the regression model)

Decision making: H_0 is rejected if $p\text{-value} < \alpha$. Based on the output above, the $p\text{-value} = 0.0000496 < \alpha = 0.05$ is obtained so that the intercept has a significant effect on the regression model with a confidence level of 95%.

- b) A partial test of the constant β_1

The hypothesis is as follows:

$H_0: \beta_1 = 0$ (The slope is not significant in the regression model)

$H_1: \beta_1 \neq 0$ (The slope is significant in the regression model)

Decision making: H_0 is rejected if $p\text{-value} < \alpha$. Based on the output above, it is obtained that $p\text{-value} = 0.0037 < \alpha = 0.05$ so that learning interest has a significant effect on the regression model with a confidence level of 95%.

Simultaneous Test

This test was carried out to measure the overall significance of the regression model. In this output, the F-statistic value is 10.83, and the $p\text{-value} = 0.003075$, which means the regression model is statistically significant.

Determination Coefficient

This determination coefficient test was carried out to measure the model's ability to explain how the influence of the independent variables together (simultaneously) affects the dependent variables, which can be indicated by the adjusted R-squared value (Ghozali, 2016; Asdar et al., 2023). The coefficient of determination (R-squared) shows how well the model can explain variations in the data. Based on the output above, it can be concluded that the regression model used is good, this can be seen from $R\text{-squared} = 0.311 = 31.10\%$. This means that 31.10% of the variation in Y can be explained by variable X, the rest is influenced by other factors.

Based on the interpretation, it can be concluded that the simple linear regression model between the variables of conceptual understanding and learning interest is not very good, because it has a low R-squared value and the coefficient of interest in learning is not statistically significant. This corresponds with research by (Hidayati & Munandar, 2023) and (Firmansyah, 2015).

In the Geometry Transformation material, researchers gave students 4 questions that included indicators of understanding concepts and learning interest. The research results were grouped according to high, medium, and low criteria.

Figure 5 explains that students' EL answers meet the indicators of understanding mathematical concepts and have a high learning interest. This student can solve all the problems given regarding Geometry Transformation material well, can write concepts for the problems given, and has an interest in studying. Students EL are diligent and disciplined in completing or answering all questions given and play an active role in group discussions. This shows that interest in learning is related to understanding mathematical concepts, whereas high learning interest is related to a high understanding of mathematical concepts.

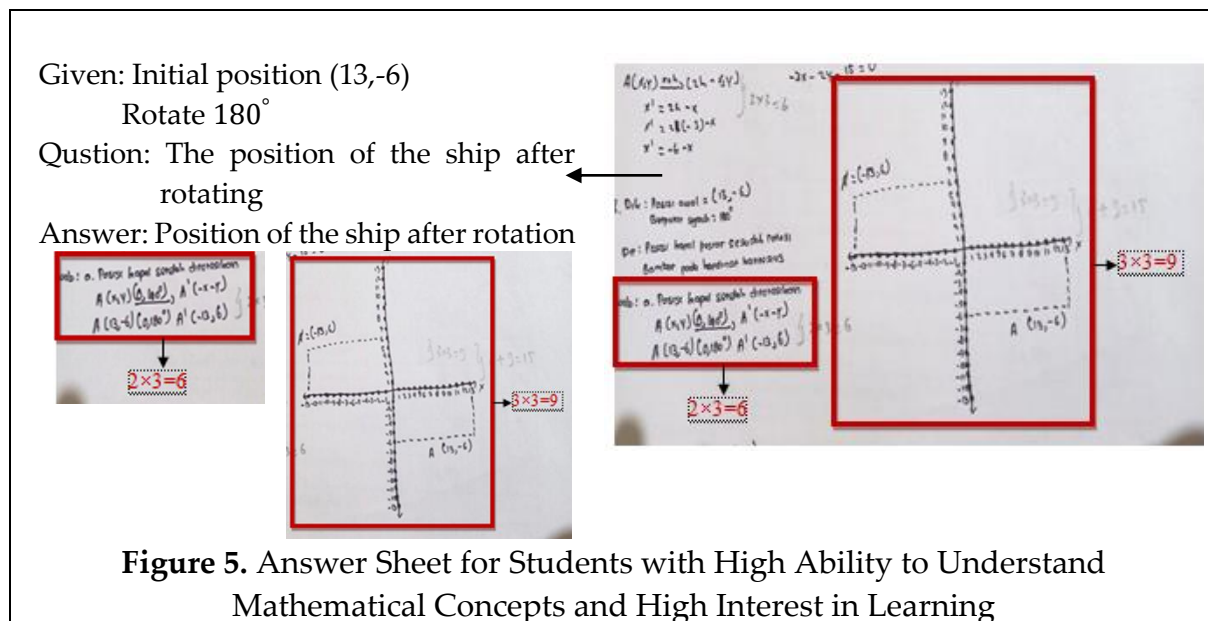


Figure 6 explains that students' SI answers do not meet the indicators of understanding mathematical concepts and have a moderate interest in learning mathematics. Students SI have not solved all the problems given regarding Geometry Transformation material properly and correctly. During the learning process, students SI feel happy so he can understand the material given by the teacher and students SI are interested in taking part in the lesson, but students SI do not participate enough when the teacher gives questions, where students SI feel embarrassed when they are ordered to do questions in front of the class. This shows that learning interest is related to understanding mathematical concepts, whereas moderate learning interest is related to a moderate understanding of mathematical concepts.

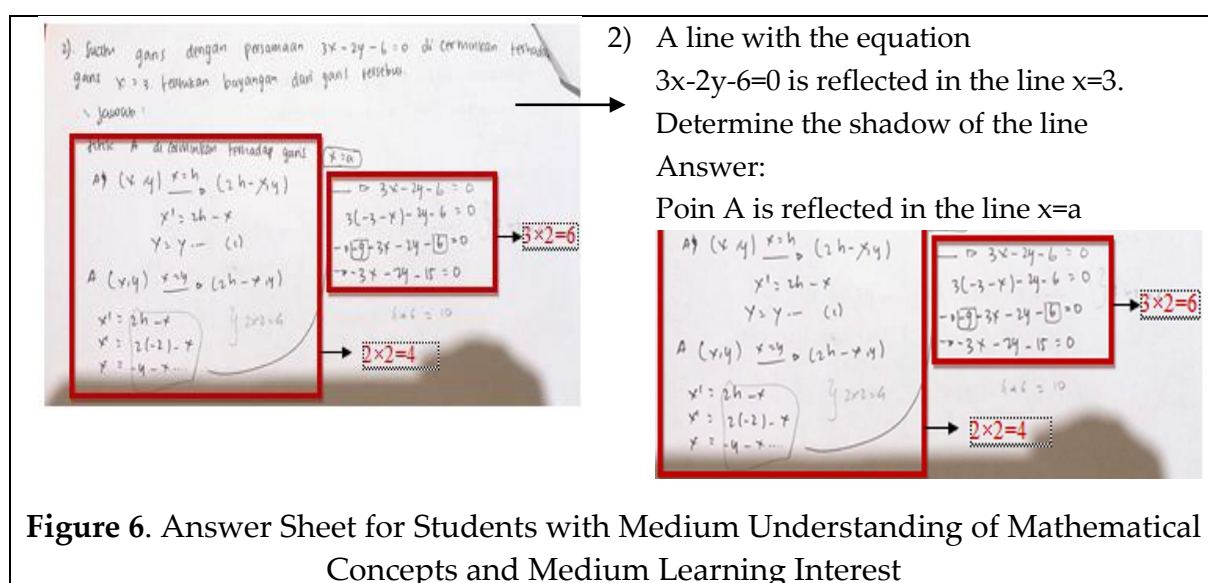
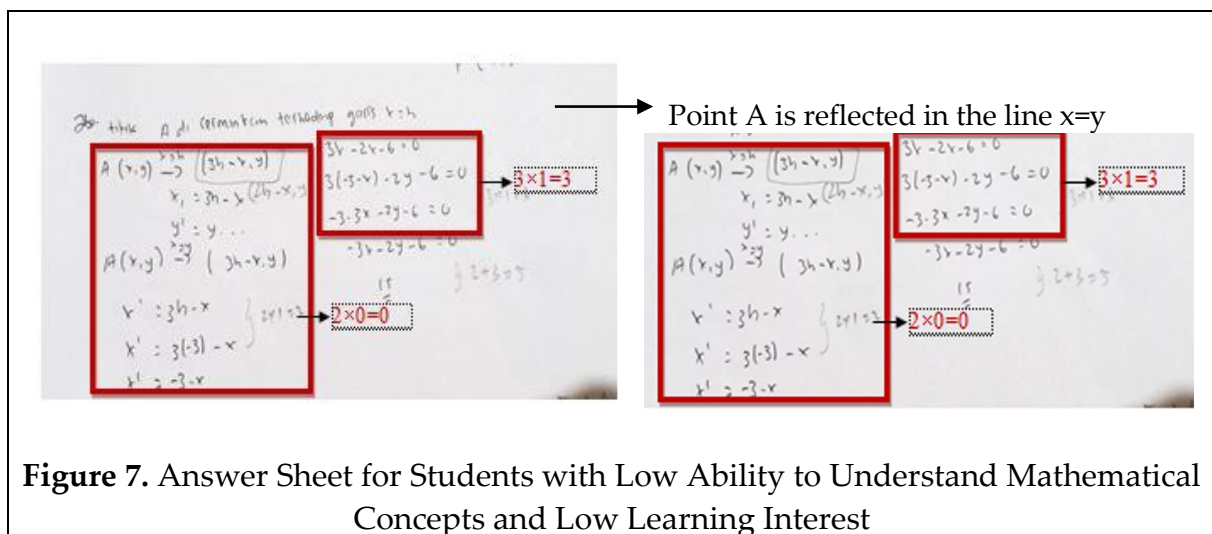


Figure 7 explains that students' BR answers do not meet the indicators of understanding mathematical concepts and have low interest in learning mathematics. Students BR were not able to solve all the problems given regarding Geometry Transformation material well, students BR were not able to write down concepts for the problems given. During the learning process, student BR did not feel happy and during group discussions, student BR just accepted the group's decision without asking first. Students BR do not respond to the assignments given. This shows that learning interest is related to understanding mathematical concepts, whereas low learning interest is related to a low understanding of mathematical concepts.



Conclusion

This research aims to determine the effect of learning interest on understanding of mathematical concepts in class XI students at SMKN 6 Padang. From the analysis carried out, a correlation of 31.10% shows that there is a positive relationship between students' interest in learning and understanding of mathematical concepts, although this relationship is not statistically significant. This conclusion is based on the processing and analysis of research data. From this, only 31.10% of students' learning interests play a role in understanding mathematical concepts; other elements not included in the research model account for the remaining portion. Further investigation is to determine the influence of other variables that have not been studied which may interact with learning interest in influencing understanding of mathematical concepts.

Acknowledgment

We would like to express our deepest gratitude to Universitas PGRI Sumatera Barat for supporting the completion of this article. We also thank the students who have helped and contributed to this research.

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