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THE EFFECT OF STUDENT LEARNING PREPARATION ON THE ACHIEVEMENT OF MATHEMATICS LEARNING IN SQUADRATE AND SQUARE ROOTS OF ROUND NUMBERS ON HIGH JUNIOR SCHOOL STUDENTS

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Abstract

The problem in this study is how students' learning readiness and how students' mathematics learning achievement, to know the data description of students' readiness in learning mathematics, knowing the description of students' mathematics learning achievement data, knowing whether there is a positive effect of student learning readiness on students' mathematics learning achievement. The population in this study were 139 students of class VII High Junior School . The sample in this study was 29% of the total population, namely 40 people. The samples were taken by a random method. The data collection tools used in this study were a questionnaire totaling 30 items and a test totaling 10 items. Then the data are collected, processed, and analyzed. The results showed that: (1) The average student learning readiness was 79.95 and the standard deviation was 10.536 (2) the students' average mathematics learning achievement was 8.825 and the standard deviation was 1.17 (3) The determination index was 0.92 which means the variable Student learning readiness (Xi) has an effect of 92% on students' mathematics learning achievement (4) There is a positive effect of student learning readiness on mathematics learning achievement of junior high school students

Keywords: Student learning, math, quadratic numbers

1. INTRODUCTION

Whether or not a student can learn something is also determined by the level of maturity. There are things that a child cannot do at the age of four but can be done by a child aged eight years, for example at the age of four children like to imitate but cannot distinguish what is appropriate to be imitated or not, while a child aged eight years already knows. According to S. [1], [2]Nasution At one time the child could think logically when faced with concrete events, but he was unable to show logical thinking when facing problems that contained symbolic elements".The opinion of S. Nasution explains that a child can think logically when faced with a real situation and cannot think logically when faced with a situation or event that uses symbols. So it can also be said that differences in the development of a child's maturity are caused by differences in intellectual skills that have been previously learned. [3]–[8]

The factors that affect student achievement are internal factors and external factors. Internal factors are factors that come from within the individual, while external factors are factors that come from outside the individual. External factors are very important because the failure and success of learning are very dependent on oneself. The ability of students to create a learning process in themselves includes supporting factors for student achievement. While the learning process occurs when students have good learning readiness.There are still many students who come to school without readiness so that at school when studying these students only play, disturb friends who are studying or just sit quietly without paying attention to when the teacher explains and does not want to do the assignment given by the teacher.[9]–[14] Although learning readiness comes from within, the teacher's role is very important in stimulating and improving the course of the teaching and learning process. To be able to carry out the task properly the teacher must know the stages of the learning process. That way the teacher knows the reasons why he does certain activities or attitudes. The teacher also has to know the extent of students' readiness to face lessons, so what the teacher does quickly gets a response from students, and vice versa.[15], [16]

2. METHOD

A. Population and Sample

1. Population is the whole object of research whose characteristics or characteristics are suspected or studied. In this study, the population was class VII High Junior School as many as 139 students.
2. Samples The sample is a portion of the population that is thought to describe the entire population. To determine the number of samples the writer cites the opinion of Suharsimi Arikunto (1997: 107): "If the number of subjects is less than 100, it is better to take all of them so that the research is a population study". The number of the study population was more than 100, so the number of samples was taken as much as 29% of the population, namely 40 people with the random method.

B. Data Collection Instruments Data collection tools in this study are adjusted to the variables with the following details:

1. To obtain data on learning readiness, in which this readiness is the independent variable (X), a closed questionnaire is used. The number of items in the study readiness questionnaire was 30 questions with a choice score of 3, 2, 1. For correct answers as expected are given a weight and answers that are not suitable are given a weight of 1 so that about the scores from the 30-90 student learning readiness questionnaire. The questionnaire is composed of: - 10 questions about attention - 10 questions about motivation - 10 questions about progress
2. To obtain data about student achievement in which student achievement as the dependent variable (Y) is done utilizing a test. The test used is in the form of multiple-choice which is arranged based on the subject matter of the Lanagan language, namely the square and the square root of integers. The number of items is 10 items with 4 answer choices. If it is true, it is given a score of 1 and if it is wrong it is given a score of 0 so the score of the test is 0-10. The test consists of: - The square of an integer is 2 questions - Determine the square of an integer of 4 questions - The square root of an integer is 4 questions

Table 1. Problem Grid

THEORY	ASPEL		ITEM NUMBER
	C_1	C_2	
THE SQUARE OF AN INTEGER		√	1,2
DETERMINE THE SQUARE OF THE INTEGER	√		3, 4, 5, 6
THE SQUARE ROOT OF AN INTEGER	√		7, 8, 9, 10

To find out the test as a data collector, the author has tested the test material, as is done by testing.

a. Test Validity

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

SX = Question score (number of students who answered correctly)

SY = Total score of all students

N = The total number of students

After writing is obtained, then it is compared with the critical price of the table from r product moment. If r¬count¬ is greater than table then the question in question is said to be valid.

b. Reliabilitas Tes

The formula used is the k-R20 formula

$$r_{11} = \left(\frac{n}{n-1}\right)\left(1 - \frac{S^2(n - \sum Pq}{S^2}\right)$$

r_{11} =Reliability test as a whole

p =Subject proposal that answers the questions correctly

q =The proportion of subjects who answered the questions incorrectly (q = 1 – p)

∑pq =The sum of the intermediate products p x q

N =Many questions

S=Standard Deviation of the test (Standard Deviation is the root of the variance)

3. RESULT AND DISCUSSION

A. Description of Data Processing

Before the data was obtained, first the test was given to the students to be tested, looking for the conditions for making good questions, namely the validity of the questions obtained 14 valid and 6 invalid (attachment 4), the reliability of the questions was obtained in the medium category (attachment 5), the level of difficulty of the questions. There are 12 medium and 8 easy categories (attachment 6), the distinguishing power of the questions is obtained 2 categories not once, 3 good, enough and 9 bad (attachment 7), distractors (distractors) obtained good results because they have been functioning at least 5% of followers of the test as well as the turnover of more than 10% of the followers of the test.

B. Data Analysis

1. Determine the range of data, namely the largest data minus the smallest data The largest data is 90 and the smallest data is 60, then the range = 90 - 60 = 30
2. Determine the number of interval classes needed, namely 3 (three)
3. Determine the length of the p interval class

1. $P = \frac{\text{Range}}{\text{many classes}} = \frac{30}{3} = 10$

Thus the criteria for students' mathematics learning readiness are:

Score 60-70 = low

Score 71-81 = moderate

Score 82-91 = high

4. Looking for the average and standard deviation of each variable as follows:

$\sum X_1$ = 3198

$\sum X_i^2$ = 260010

$\sum Y_i$ = 353

$\sum Y_i^2$ = 3169

N = 40

Mean and standard deviation of students' mathematics learning readiness (X)

$$\overline{X} = \frac{\sum X_i}{n}$$

$$= \frac{3198}{40}$$

$$\overline{X} = 79{,}95$$

$$S_x = \sqrt{\frac{n\sum X_i^2 - (\sum X_i)^2}{n(n-1)}}$$

$$= \sqrt{\frac{40(260010) - (3198)^2}{40(40-1)}}$$

$$= \sqrt{\frac{10400400 - 10227204}{40(39)}}$$

$$= \sqrt{\frac{173196}{1560}}$$

$$= \sqrt{111{,}023}$$

$$S_x = 10{,}536$$

Average standard deviation of mathematics learning achievement (Y)

$$\overline{Y} = \frac{\sum Y_i}{n}$$

$$= \frac{353}{40}$$

$$\overline{Y} = 8{,}825$$

$$S_x = \sqrt{\frac{n\sum Y_i^2 - (\sum Y_i)^2}{n(n-1)}}$$

$$= \sqrt{\frac{40(3169) - (353)^2}{40(40-1)}}$$

$$= \sqrt{\frac{126760 - 124609}{40(39)}}$$

$$= \sqrt{\frac{2151}{1560}}$$

$$= \sqrt{1{,}378}$$

$$S_y = 1{,}17$$

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5. Calculating the correlation coefficient (r)

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

$$= \frac{40(28689) - (3198)(353)}{\sqrt{\{40(260010) - (3198)^2\}\{40(3169) - (353)^2\}}}$$

$$= \frac{1147560 - 1128894}{\sqrt{\{(10400400) - (10227204)\}\{(126760) - (124609)\}}}$$

$$= \frac{18666}{\sqrt{(372544596)}}$$

$$= \frac{18666}{19301{,}41}$$

$$= 0{,}96$$

From the calculation results, it can be seen that $r \neq 0$, meaning that there is a positive correlation between variable X and variable Y. This shows that by increasing student learning readiness, student learning achievement will also increase.

6. Calculating the Determination Index

By looking at the value of r that has been obtained, the index of determination:

$I = r^2$

$I = (0{,}96)^2$

$I = 0{,}92$

This means that the Y variable has a high degree of relationship with the X variable of 0.92 or 92%, then the high and low level of student mathematics learning achievement can be seen by the student's learning readiness by 98%.

7. Research Hypothesis Test

$H_0 : \rho = 0$

$H_1 : \rho \neq 0$

The results of the calculation of the hypothesis test are:

$$T = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$= \frac{0{,}96\sqrt{40-2}}{\sqrt{1-(0{,}96)^2}}$$

$$= \frac{5{,}92}{0{,}28}$$

$$= 21{,}14$$

$T = 21{,}14$

These results are compared with the t value in the table for the real level $\alpha = 0.05$ and degrees of freedom (n-1) = 39 obtained: t $(1-1 / 2\alpha)$ = t (0.975) (39) = 0.316 It turns out that thit> t (0.975) (39) then H1 is accepted or Ho is rejected and it can be stated that there is an effect of student learning readiness on mathematics learning achievement of seventh-grade junior high school students.

4. CONCLUSION

Based on the results of the research that has been obtained from the data analysis of the research hypothesis testing funds, it is concluded, the average student learning readiness = 79.95 and the standard deviation (Sx) = 10.536, the students' average mathematics learning achievement = 8.825 and the standard deviation (SY) = 1.1, the determination index is 0.92, which means that the student learning readiness variable (Xi) has an effect of 92% on students 'mathematics learning achievement or (Yi), there is a positive influence on students' learning readiness on mathematics learning achievement on Quadratic Subjects and Square Root of the student's Integer Number.

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