The Relationship of Self-Concept and Learning Style with Mathematics Learning Outcomes of Students of Class VII MTSN 2 of Palangka Raya

Muhammad Hamdani[1], Orbit Thomas[2], Simpun[3], Rosha Safrina[4]

[1,2,3,4] FKIP Universitas Palangka Raya, Indonesia
muhamadhamdani182@gmail.com

Abstract

The aims of knowing: 1) The relationship between self-concept and mathematics learning outcomes of grade VII MTsN 2 Palangka Raya students based on visual learning styles. 2) The relationship between self-concept and mathematics learning outcomes for grade VII MTsN 2 Palangka Raya students based on auditory learning styles. 3) The relationship between self-concept and mathematics learning outcomes for grade VII students of MTsN 2 Palangka Raya City based on kinesthetic learning styles. This study uses a quantitative approach to the type of correlational research. This research was conducted in the odd semester of the 2020/2021 academic year. Based on the results of the self-concept questionnaire test results obtained 20 valid statements with a reliability coefficient of $r_{11} = 0.84$, and for the test of mathematics learning outcomes obtained 27 valid questions with a reliability coefficient $r_{11} = 0.87$. Prerequisite test results of parametric statistical analysis for normality test based on visual learning style, self-concept data obtained $\chi^2 count = 31.99 > 9.49 = \chi^2 tables$ and data on mathematics learning outcomes $\chi^2 count = 13.07 > 11.07 = \chi^2 table$ with $dk = i - 3 = 8 - 3 = 5$ and a significant level of 5% which means that all data are not normally distributed. For the normality test based on the auditory learning style, self-concept data were obtained $\chi^2 count = 9.21 > 7.81 = \chi^2 tables$ and data on mathematics learning outcomes $\chi^2 count = 2.76 < 7.81 = \chi^2 table$ with $dk = i - 3 = 6 - 3 = 3$ and a significant level of 5%, which means that self-concept data is not normally distributed and data on mathematics learning outcomes is normally distributed. Meanwhile, for the normality test based on kinesthetic learning styles, self-concept data were obtained $\chi^2 count = 27.29 > 9.49 = \chi^2 tables$ and data on mathematics learning outcomes $\chi^2 count = 1.13 < 5.99 = \chi^2 table$ with $dk = i - 3 = 5 - 3 = 2$ and a significant level of 5%, which means that the concept data is not normally distributed and the data on mathematics learning outcomes is normally distributed. The results of the study show that: (1) there is a significant positive relationship between self-concept and students' mathematics learning outcomes based on visual learning styles, the correlation coefficient is = 0.174; (2) self-concept with students' mathematics learning outcomes based on auditory learning style, the correlation coefficient is = 0.390; (3) there is a significant positive relationship between self-concept and students' mathematics learning outcomes based on kinesthetic learning styles, the correlation coefficient is = 0.549. $r_s r_s r_s$

I. Introduction

Education is an important thing in advancing a nation. Education as the basis of nation building can create human beings who have critical and creative thinking as capital to obtain a better future. This is in accordance with Law no. 20 of 2003 concerning the National Education System in Suardi (2018:25) states as follows:

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Education is a very important human need because education has a duty to prepare Human Resources (HR) for the development of the nation and state (Pradana et al, 2020). According to Astuti et al (2019) Education is an obligation of every human being that must be pursued to hold responsibilities and try to produce progress in knowledge and experience for the lives of every individual. Education is one of the efforts to improve the ability of human intelligence, thus he is able to improve the quality of his life (Saleh and Mujahiddin, 2020). Education is expected to be able to answer all the challenges of the times and be able to foster national generations, so that people become reliable and of high quality, with strong characteristics, clear identities and able to deal with current and future problems (Azhar, 2018). Education and skills are the main keys in gaining social status in community life (Lubis et al, 2019).

"National education functions to develop the ability of dignified national character and civilization in the context of educating the nation's life, aiming at developing the potential to become human beings who believe and are devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens".

Based on this law, education cannot be separated from learning activities. One of the places is school. School is a formal educational institution. One of the functions of schools is to advance the quality of human resources. Schools are places where students get learning under the supervision of teachers, where students are taught to learn various sciences, one of which is mathematics.

Mathematics is an important subject for students to develop ways of thinking and problem-solving skills. Various efforts were made by the teacher to create effective learning activities for students with the aim of achieving the desired mathematics learning outcomes.

Learning outcomes are changes in the abilities possessed by students after carrying out learning activities. This is in line with Djamarah (2011:175) which states that learning outcomes are changes as a result of learning activities. Learning outcomes are obtained through a learning process that cannot be separated from the factors that influence it. According to Sudjana (Susanto, 2013:15), "learning outcomes achieved by students are influenced by factors, namely factors within students and factors that come from outside students". One of the factors that come from students is self-concept.

Self-concept is an important aspect in a person because self-concept has a strong influence on one's behavior. According to Ardiyanti, (2017: 30) self-concept is how an individual perceives himself. Self-concept is divided into two patterns, namely positive self-concept and negative self-concept. Students who have a positive self-concept will always try to learn mathematics by always doing the assignments given by the teacher with confidence, doing it according to their own abilities. While the negative self-concept will look pessimistic, feel unnoticed, and consider themselves helpless.

In addition to self-concept, factors that influence learning outcomes are learning styles. According to Susilo (2016: 94) learning style is a way that a person tends to choose to receive information from the environment and process that information. Learning style is a combination of how students absorb, organize and process information. Learning styles can be classified into three types, namely visual learning styles, auditory learning styles, and kinesthetic learning styles. Visual learning style emphasizes the sense of sight, tends to learn by looking at things such as pictures, diagrams, or videos. Auditory learning style prioritizes the sense of hearing, tends to learn by hearing things such as discussions, debates, and verbal instructions.

Based on the results of interviews with teachers who are deputy heads of madrasas in the academic section, it is stated that in the last three years the learning outcomes of

mathematics are still relatively low. In the last three years, it can be seen that the 2016/2017 school year was 39.20, the 2017/2018 school year was 39.40, and the 2018/2019 school year was 40.05.

Based on the results of observations made at MTsN 2 Palangka Raya City, most students consider mathematics to be a difficult subject. This assumption may be because students have a negative self-concept towards their mathematical abilities. This happens because there are still many students who are not confident in their abilities so that when learning activities take place they do not dare to come forward if they are ordered to work on the questions that have been given in front of the class. Furthermore, differences in the characteristics of students' learning styles are also seen during the learning process. During the teaching and learning process in the classroom, the teaching methods that teachers use are still focused on conventional teaching methods,

Based on the description above, the researchers are interested in conducting research entitled "The Relationship of Self-Concept and Learning Style with Mathematics Learning Outcomes of Class VII MTsN 2 Palangka Raya Students".

II. Research Method

This study uses a quantitative approach where the data taken are in the form of numbers and analyzed using statistics, with the aim of testing the established hypothesis (Sugiyono, 2015: 14). The type of research used is correlational research which aims to determine whether there is a relationship between the two independent variables on the dependent variable under study. To see the relationship between the variables in this study, namely self-concept and learning style with mathematics learning outcomes for class VII MTsN 2 Palangka Raya City.

This research involves two independent variables (independent variable) and one dependent variable (dependent variable). Where the first independent variable (X1) is self-concept and the second independent variable (X2) is learning style, while the dependent variable (Y) in this study is the mathematics learning outcomes of class VII MTsN 2 Palangka Raya students.
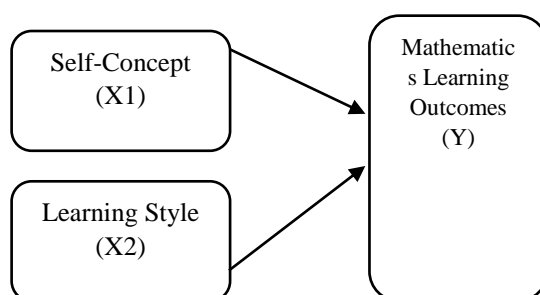
The population used in this study were all grade VII students of MTsN 2 Palangka Raya City for the 2020/2021 academic year which consisted of 10 classes with a total of 273 students. In this study, all students were given a questionnaire. So that the data analyzed in this study amounted to 203 students.

Before the data is analyzed, it is necessary to test the requirements of the analysis. The test is a normality test. The normality test was carried out on the two variables to be studied, namely the independent variable and the dependent variable. In this study, the normality test used the Chi-Square test ($\square^2$). The Chi-Square test formula (Mairing, 2017: 129) is as follows:

$$\chi^2\text{count} = \sum \frac{(O_i - E_i)^2}{E_i}$$

Information:

χ^2 = Chi-Square

O_i = i-th class observed frequency

E_i = Theoretical frequency/expected class i

With a significant level of 5% obtained from comparing χ^2count with χ^2table so that if χ^2count$\leq\chi^2$table then the data is normally distributed and vice versa if χ^2count$>\chi^2$table then the data is not normally distributed.

This study has three hypotheses that must be tested for truth, namely:

a. There is a positive relationship between self-concept and mathematics learning outcomes for grade VII MTsN 2 Palangka Raya students based on visual learning styles.

b. There is a positive relationship between self-concept and mathematics learning outcomes for grade VII MTsN 2 Palangka Raya students based on auditory learning styles.

c. There is a positive relationship between self-concept and mathematics learning outcomes for grade VII MTsN 2 Palangka Raya students based on kinesthetic learning styles.

To test the first, second and third hypotheses, Spearman Rank correlation analysis was used (Mairing, 2017: 313) as follows:

$$r_s = 1 - \frac{6\sum_{i=1}^{n}(R(X_i) - (R(Y_i))^2}{n(n^2 - 1)}$$

Information:

(X_i, Y_i) = data pair for the i-th subject

$R(X_i)$ = data rank with i = 1, 2, 3, … , n

$R(Y_i)$ = data rank with i = 1, 2, 3, … , n

n = number of data

If the number of sample members is more than 30, the standard normal distribution approach is carried out as follows:

$$z_{hitung} = r_s\sqrt{n - 1}$$

Meanwhile, to test the significance is calculated by t-test (Sugiyono, 2015: 257) as follows:

$$t = \frac{r\sqrt{N - 2}}{\sqrt{1 - r^2}}$$

Information:

t = value tcount

r = Correlation coefficient

N = Sample size

Furthermore, the tcount value obtained is compared with ttable at a significant level of 5% and degrees of freedom (dk = n - 2) with the test criteria, namely if tcount > ttable then the correlation coefficient tested is significant and vice versa if tcount $\leq$ t table then the correlation coefficient tested is not significant.

2.1 Research Instruments

The instruments used in data collection in this study were questionnaires and tests. Questionnaires were used to obtain data from the independent variables, namely self-concept and learning styles, while tests were used to obtain data from the dependent variable, namely mathematics learning outcomes.

III. Result and Discussion

3.1 Research result

The analytical prerequisite test used is the normality test with the Chi-Square test. Based on the calculation of the normality test data, the self-concept score based on the visual learning style is obtained x^2_{count} of 31.99 at a price of x^2_{table} with dk = 4 and = 0.05 is 9.49 then $x^2_{count} > x^2_{table}$ (not normally distributed). Test the normality of the score data on mathematics learning outcomes based on visual learning styles obtained x^2_{count} of 13.95 at a price of x^2_{table} with dk = 5 is 11.07 then $x^2_{count} > x^2_{table}$ (not normally distributed).

The normality test of the self-concept score data based on the auditory learning style was obtained x^2_{count} of 9.21 at a price of x^2_{table} with dk = 3 and = 0.05 is 7.81 then $x^2_{count} > x^2_{table}$ (not normally distributed). The normality test of the score data on mathematics learning outcomes based on auditory learning styles is obtained x^2_{count} of 2.76 at a price of x^2_{table} with dk = 3 and = 0.05 is 7.81 for then $x^2_{count} < x^2_{table}$ (normally distributed).

The normality test of the self-concept score data based on the kinesthetic learning style was obtained x^2_{count} of 27.29 at a price of x^2_{table} with dk = 4 and = 0.05 is 9.49 then $x^2_{count} > x^2_{table}$ (not normally distributed). The normality test of the score data on mathematics learning outcomes based on kinesthetic learning styles is obtained x^2_{count} of 1,130 at a price of x^2_{table} with dk = 2 and = 0.05 is 5.991 for then $x^2_{count} < x^2_{table}$ (normally distributed).

The following are the conclusions of the normality test of self-concept data and learning outcomes of the three learning styles:

Table 1. Results of Data Normality Test Analysis

Normality test		x^{2count}	x^{2table}	Information
Self-concept	Visual	31.99	9.49	Not normally distributed
	Auditorial	9.21	7.81	Not normally distributed
	Kinesthetic	27.29	9.49	Not normally distributed
Learning outcomes	Visual	13.95	11.07	Not normally distributed
	Auditorial	2.76	7.81	Normal Distribution
	Kinesthetic	1,130	5,991	Normal Distribution

a. Hypothesis Testing the Relationship of Self-Concept (X) with Mathematics Learning Outcomes (Y) Based on Visual Learning Style

Testing the first hypothesis using the Spearman Rank correlation, the correlation coefficient between self-concept and students' mathematics learning outcomes is 0.174 or $z_{count} > z_{table} = 1.90 > 1.64$. Significance test using t, obtained t value of 1.92. The value of t_{table} with dk = 120 – 2 = 118 and = 5% is 1.66. The value of $t_{count} > t_{table}$, so it can be stated

that Ho1 is rejected and Ha1 is accepted. So, it can be concluded that there is a significant positive relationship between self-concept and mathematics learning outcomes based on visual learning styles.

b. Hypothesis Testing the Relationship of Self-Concept (X) with Mathematics Learning Outcomes (Y) Based on Auditorial Learning Style

Testing the second hypothesis using the Spearman Rank correlation, the correlation coefficient between self-concept and students' mathematics learning outcomes is 0.390 or $z_{count} > z_{table} = 2.65 > 1.64$. Significance test using t, obtained t value of 2.84. The value of t_{table} with dk $= 47 - 2 = 45$ and $= 5\%$ is 1.68. The value of $t_{count} > t_{table}$, so it can be stated that Ho2 is rejected and Ha2 is accepted. So, it can be concluded that there is a significant positive relationship between self-concept and mathematics learning outcomes based on auditory learning styles.

c. Hypothesis Testing the Relationship of Self-Concept (X) with Mathematics Learning Outcomes (Y) Based on Kinesthetic Learning Style

Testing the third hypothesis using the Spearman Rank correlation, the correlation coefficient between self-concept and students' mathematics learning outcomes is 0.549 or $z_{count} > z_{table} = 3.25 > 1.64$. Significance test using t, obtained t_{count} value of 3.83. The value of t_{table} with dk $= 36 - 2 = 34$ and $= 5\%$ is 1.69. The value of $t_{count} > t_{table}$, so it can be stated that Ho3 is rejected and Ha3 is accepted. So, it can be concluded that there is a significant positive relationship between self-concept and mathematics learning outcomes based on kinesthetic learning styles.

3.2 Discussion

In the results of research with statistical analysis, it is known that the first hypothesis, second hypothesis and third hypothesis are accepted. For the first hypothesis obtained a correlation coefficient of 0.174 where the relationship is classified as very low. The value means that there is a positive relationship between self-concept and mathematics learning outcomes. While the results of the calculation of t obtained $t_{count} = 1.92 > t_{table} = 1.66$ so that it can be stated that Ho1 is rejected and Ha1 is accepted. So, it can be concluded that there is a significant positive relationship between self-concept and mathematics learning outcomes based on visual learning styles, which means that the higher the student's self-concept, the higher the mathematics learning outcomes. $z_{hitung} = 1,90 > z_{tabel} = 1,64$

For the second hypothesis obtained a correlation coefficient of 0.390 where the relationship is relatively low. The value means that there is a positive relationship between self-concept and mathematics learning outcomes. While the results of the calculation of t obtained $t_{count} = 2.84 > t_{table} = 1.68$ so that it can be stated that Ho2 is rejected and Ha2 is accepted. So, it can be concluded that there is a significant positive relationship between self-concept and mathematics learning outcomes based on auditory learning styles, which means that the higher students' self-concept, the higher their mathematics learning outcomes. This is in accordance with research conducted by Wirawan, et al. (2018) which concludes that there is a significant positive relationship between self-concept and mathematics learning outcomes. $z_{hitung} = 2,65 > z_{tabel} = 1,64$

Meanwhile, for the third hypothesis, a correlation coefficient of 0.549 is obtained where the relationship is classified as moderate. The value means that there is a positive relationship between self-concept and mathematics learning outcomes. While the results of the calculation

of t obtained t_{count} = 3.83> t_{table} = 1.69 so that it can be stated that Ho3 is rejected and Ha3 is accepted. So, it can be concluded that there is a significant positive relationship between self-concept and mathematics learning outcomes based on kinesthetic learning styles, which means that the higher students' self-concept, the higher their mathematics learning outcomes. This is in accordance with research conducted by Cresli (2019) which concluded that there was a significant positive relationship between self-concept and mathematics learning outcomes. $z_{hitung} = 3,25 > z_{tabel} = 1,64$

Students who have a good self-concept also have high self-confidence and a positive view of themselves so that they are able to take part in mathematics learning well, because students who have a good self-concept always have a positive attitude towards everything (Sumiyati, et al., 2017). If students have a positive self-concept, they will always be optimistic to be better, especially when studying in order to get good learning outcomes.

In this study, a large correlation coefficient is found in the kinesthetic learning style, which is 0.549. This is in accordance with research conducted by Putri, et al. (2019) where the kinesthetic learning style is one of the learning styles that students often use. This shows that the student learning styles in the kinesthetic learning style group are appropriate. Kinesthetic learning styles tend to include movement or touch when receiving information. Students who have a kinesthetic learning style prefer math lessons through games.

Based on the theory expressed by Deporter and Henarcki (2017), students who have a kinesthetic learning style learn through active moving, touching, and doing. Students with this learning style cannot stand if they have to sit for long listening to the subject matter. In learning mathematics, students are required to always practice working on problems related to the mathematical material being studied so that students who have a kinesthetic learning style prefer group learning accompanied by games or using learning media related to mathematics (Jumroidah, et al, 2018).

Students with appropriate learning styles will not easily give up in doing or completing math assignments, this is in line with a positive self-concept. Students who have a positive self-concept tend to have high confidence in their ability to solve mathematical problems. With a positive self-concept and appropriate learning styles, students will have good learning outcomes as well.

Based on the description above, because the results of this study are in accordance with the opinions of experts and in line with several studies from previous researchers, it can be concluded that the better students' self-concept towards mathematics lessons and the more appropriate the learning styles of students, the better students' learning outcomes in mathematics.

IV. Conclusion

Based on the results of data analysis that has been presented in chapter IV, the research conducted can be concluded as follows:
a. There is a significant positive relationship between self-concept and students' mathematics learning outcomes based on visual learning styles.
b. There is a significant positive relationship between self-concept and students' mathematics learning outcomes based on auditory learning styles.
c. There is a significant positive relationship between self-concept and students' mathematics learning outcomes based on kinesthetic learning styles.

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