The Influence of *Anxiety* and Perception on Mathematics Learning on Understanding the Concepts of Students of Class VIII Junior High School 16 Bengkulu City

Noke Hanif Afriani[✉], Hanifah Hanifah, and Zamzaili Zamzaili

Mathematics Education Study Program, Bengkulu University, Jl. WR Supratman,
Bengkulu 38122, Indonesia
nokehanif@gmail.com

Abstract. This research aims to determine the relationship and influence of anxiety and perception on learning mathematics on the concept of understanding. The research used is ex post facto and analyzed using pathway analysis. These instruments use anxiety questionnaires, perception questionnaires about learning mathematics, and understanding concepts. The population in this study is class VIII State Junior High School 16 Bengkulu City in the 2020/2021 school year, with a research sample of 64 people, namely the class. VIII.D numbered 32 people and class VIII.E numbered 32 people. The results showed that anxiety affects the understanding of concepts, the perception of learning mathematics also affects the understanding of concepts. Analysis of hypotheses shows that there is a significant and significant relationship between instruments.

Keywords: Understanding Concepts · *anxiety* · Perception in Learning Mathematics First Section

1 Introduction

A math lesson is a lesson that deals with many concepts. Solving mathematical problems is important, but on the other hand, learners often have difficulty solving mathematical problems. The weaknesses and difficulties of learners in answering math problems are caused by low mastery of mathematics, such as mathematical concepts (Hartati, Abdullah & Haji, 2017). This is in line with Ruseffendi (2006: 156) who argued that many learners who after learning mathematics, are unable to understand even the simplest parts, many concepts are mistakenly understood so that mathematics is considered a difficult, complicated, and difficult science.

Inability to understand mathematical concepts can cause anxiety of learners at the time of math lessons. Learners who experience math anxiety tend to avoid situations where they have to study and do math. The anxiety experienced by learners in math subjects is often referred to as mathematics anxiety. This is in line with Ashcraft in

Anita ([2014]: 97) which defines math anxiety as a feeling of tension, anxiety or fear that interferes with learners in doing math problems.

According to Everingham, Gyuris & Connolly ([2017]) anxiety is an unpleasant feeling or emotional state with a variety of physiological phenomena and behavior phenomena that occur naturally. Anxiety can also be interpreted as negative emotions. When a person is anxious, often unable to make specifications about the source of his anxiety (Sarastika, [2014]). In general, they experience fear. So they try to overcome it by finding a safe place. The anxiety that students experience in math subjects is often referred to as Math anxiety (Math anxiety). Math anxiety cannot be viewed as common, because students' inability to adapt to math lessons causes students difficulties as well as phobias of mathematics which eventually lead to lower learning outcomes and student achievement (Winarso & Haqq, [2019]; Zahro & Purwaningsih, [2018]).

I Gede ([2010]) explains that the manifestation of anxiety occurs as a result of collaboration and the uncontrolled fusion of three aspects in the individual. These aspects are: (a) Cognitive manifestations, which manifest in the form of tension of the student's mind, thus making it difficult for students to concentrate, confusion in answering questions and experiencing mental blocking, (b) affective manifestations, manifested in unpleasant feelings such as, fear, excessive restlessness, worry, and (c) uncontrolled motor manifestations, which are controlled in erratic movements trembling like trembling shaking.

Perception is the process of organizing and interpreting stimulus patterns in the environment. Perception is very important in the educational process because with this perception will affect the way students think. If in a good perception learning then education is considered successful while without any perception in students, then education does not succeed.

Based on the observations of researchers while teaching at SMPN 16 Kota Bengkulu and the results of interviews with math teachers at SMPN also showed that there has never been research on perception and anxiety and the relationship of the two variables with the ability to think critically of mathematics. Based on the background description above, the title of this study is "The Influence of Anxiety And Perception on Mathematical Learning on The Understanding of Students of Class VIII Junior High School 16 Bengkulu City".

2 Method

This research began with preparations to make a grid of instruments, compiling scientific research instruments justified by the guidance lecturer. Once the instrument is declared viable we just tested it. Furthermore, the test results are analyzed whether it is valid or reliable, if it is invalid and reliable will not be used and only uses those that are completely valid and reliable. Valid and reliable instruments are an absolute requirement to obtain valid and reliable research results. Valid means that the data obtained through questionnaires can answer the purpose of this study, while reliable means consistent or stable when used for other research.

The study uses instruments by spreading research instruments to the entire sample. The scale of the instrument used is the likert scale. In this study the scale used for perception questionnaires is the Likert Scale as shown in Table 1.

Table 1. Alternative of answers and scores by *Likert scale*

Alternative Answers	Score for statements	
	Positive	Negative
Totally agree (SS)	4	1
Agree (S)	3	2
Disagree (TS)	2	3
Strongly Disagree (STS)	1	4

3 Result and Discussion

3.1 Data Description

The description of research data obtained from this field is intended to provide an overview of the dissemination of data or data distribution in the form of central symptom size, location size, and frequency distribution. Based on the number of variables and referring to research problems, it can be grouped into five parts, namely Anxiety (X1), Perception in Learning Mathematics (X2), and Understanding Concepts (Y).

From the data obtained, the distribution of each variable can be described. Grouping data, frequency distribution, average, standard deviation, median, mode, standard deviation, variance, range, minimum, maximum. The results of the description can be seen in the following Table 2.

3.2 Prerequisite Test Data Analysis of Student Problem Solving Skills

Prerequisite tests are normality test, multicollinearity and linearity test.

The calculation of the normality test in the test of the requirements of this analysis is done using the regressi estimate error (residue). Calculation of estimated error using *SPSS* version 23 help using shapiro-wilk formula. The decision-making for SPSS version 23 is:

If sig. $> \alpha = 0.05$ then normal distributed data
If sig. $< \alpha = 0.05$ then the distribution of data is not normal.

Normality testing is done on between variables, namely X_1 with X_2 X_1 with Y and X_2 with Y. The results of the data normality test calculation between research variables are obtained as shown in Tables 3 and 4.

Table 2. Summary of Statistical Analysis of Each Variable Statistics

Anxiety (X1)			Perception In Learning Mathematics (X2)	Understanding Concepts (Y)
N	Legitimate	64	64	64
	Missing	0	0	0
Mean		73,5156	38,1094	73,3594
STD. Mistakes Mean		1,84990	,78336	2,03837
Median		73,5000	37,0000	75,0000
Mood		64.00[a]	37,00	75,00
Std. Deviations		14,79918	6,26686	16,30694
Variance		219,016	39,274	265,916
Range		58,00	24,00	60,00
Minimum		44,00	27,00	40,00
Maximum		102,00	51,00	100,00
Sum		4705,00	2439,00	4695,00

Table 3. Normality Test Error

		Minimum	Maximum	Mean	Std. Deviation	N
Galat X1 dan Y	Predicted Value	59.03	87.19	73.36	7.185	64
	Residual	-31.022	37.572	0.000	14.639	64
Galat X2 dan Y	Predicted Value	57.30	91.99	73.36	9.059	64
	Residual	-34.647	28.363	0.000	13.559	64
Galat X1 dan X2	Predicted Value	34.11	41.96	38.11	2.003	64
	Residual	-11.852	12.938	0.000	5.938	64

Based on Table 4 it can be concluded that all test pairs have normal distributed data due to each test pair of Asymp values. Sig > .05. 0.867 for x1 and y, i.e. 0.782 for x2 and y and i.e. 0.077 for x1 and x2.

1. Linearity Test
Linearity testing in this study uses the help of SPSS version 23 with conditions, namely:

Table 4. Normality Test Results

	Shapiro-Wilk		
	Statistic	df	Sig.
Residu x1 dan y	0.990	64	0.867
Residu x2 dan y	0.988	64	0.782
Residu x1 dan x2	0.966	64	0.077

Table 5. Linearity Test Results

Test Partner	Sig.	Alpha	Condition	Decision
X1 with X2	0,341	0.05	Sig > Alpha	Linear Relationships
X1 with Y	0,094		Sig > Alpha	Linear Relationships
X2 with Y	0,792		Sig > Alpha	Linear Relationships

Table 6. Matris Intercorrelation

		Anxiety	Perception	Understanding Concepts
Anxiety	Pearson Correlation	1	.320*	.441**
Perception	Pearson Correlation	.320*	1	.556**
Understanding concepts	Pearson Correlation	.441**	.556**	1

If sig. > 0.05, there is a significant linear relationship.
If sig. < 0.05, there is no significant linear relationship.
Results of data linearity the following research variables.

Based on Table 5, it is obtained that the value sig. > 0.05. Therefore, we can conclude that there is a significant linear circuit in the variable test pair.

2. Multicollinearity Test
First look at the intercorrelation matrix between variables calculated using the help of SPSS obtained the results as shown in Table 6.

It is seen that correlations between variables The highest is perception (x2) and concept understanding (y) which is 0.556, which means qualified.

Table 7. Multicollinearity Test Results

Variabel Independen	*Tolerance*	*Tolerance Condition*	VIF	VIF Condition	Conclusion
Anxiety	0,898	*tolerance* > 0.10	1,114	VIF < 10	There is no multicollinearity
Perception on Learning Mathematics	0,898	*tolerance* > 0.10	1,114	VIF < 10	

The calculation of multicollinearity test in this study was conducted using the help of SPSS by looking at tolerance values and Variance Inflation Factor values:

1. Based on tolerance
   Decision making is if *the tolerance* value < 0.10 then there is multicollinearity in the regression model, and vice versa.
2. *Variance Inflation Factor* (VIF) Decision making is that if the VIF value > 10 then there is multicollinearity in the regression model, and vice versa.

The results of the multicollinearity test calculations of these study variables in the study sample using the help of SPSS version 23 were obtained as shown in Table 7.

Based on the Table 7, it is known that the *tolerance* value for each variable is greater than 0.10. Meanwhile, the VIF value for each variable is less than 10.00. Therefore, we can conclude that there are no symptoms. multicollinearity in regression models.

Hypothesis Test

1. *Anxiety* (X_1) has a direct effect on Perception in Mathematical Learning (X2) The research hypothesis to be tested is formulated in the form of the following statistical hypothesis.

Ha	: ρx2x1 = 0	There is a relationship between *anxiety* (X1) and perception in learning. Mathematics (X2)
Ho	: ρx2x1 ≠ 0	There is a relationship between anxiety (X1) of perception in mathematical learning (X2)

Table 8. Direct Influence of X1 on X2

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	28.160	3.820		7.371	0.000
	Kecemasan	0.135	0.051	0.320	2.656	0.010

To know the significance of the path analysis is to compare the probability value of 0.05 with the probability value of Sig. on the basis of decision-making as follows:

- If the probability value of 0.05 is smaller than or equal to the sig probability value or [$0.05 \leq$ Sig.] then H0 is accepted and Ha To be rejected is insignificant.
- If the probability value of 0.05 is greater than or equal to the probability value of Sig or [$0.05 \geq$ Sig.] then H0 is rejected and Ha Accepted means significant.

Based on the results of calculations in the sig column. in the attachment obtained the value tcalculate $= 2,656 >$ ttable $= 2.0003$, $\rho yx2x1 = 0.320$ sig. 0.010. Since the value sig.0.010 is less than the probability value of $\alpha = 0.05$, Ho is rejected and Ha is accepted meaning that the path analysis coefficient is related. So, there is The direct influence between anxiety (X1) on perception on mathematical learning (X2) is as large as itis. $\rho x1x2 = 0.320$ (Table 8).

2. Anxiety (X1) has a direct effect on understanding concepts (Y)
   The research hypothesis to be tested is formulated in the form of the following statistical hypothesis

Ha   : $\rho yx1 = 0$ There is a significant effect *of anxiety* (X1) Understanding concepts (Y)

Ho   : $\rho yx1 \neq 0$ There is no significant influence *on anxiety* (X1) On understanding Concept (Y)

The basis of decision making is as follows:

- If the probability value of 0.05 is smaller than or equal to the sig probability value or [$0.05 \leq$ Sig., then H0 is accepted and Ha rejected means insignificant.
- If the probability value of 0.05 is greater than or equal to the probability value of Sig or $0.05 \geq$ Sig. Then H0 is rejected and Ha is accepted to mean significant.

Table 9. Direct Influence of X1, X2 Against Y

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	**Std. Error**	**Beta**		
1	(Constant)	3.823	11.355		0.337	0.737
	Kecemasan	0.323	0.117	0.293	2.767	0.007
	Persepsi	1.202	0.276	0.462	4.361	0.000

Based on the results of calculations in the sig column, in attachment obtained value tcalculate $= 2,767 >$ ttable $= 2.0003$ ρyx1 $= 0.293$ sig. 0.007. Because of the sig value. 0.007 is less than the probability value of $\alpha = 0.05$, so Ho is rejected and Ha is accepted meaning that there is a significant influence on *Anxiety* (X1) on understanding concepts (Y). Thus, *Anxiety* (X1) significantly affects concept understanding (Y).

3. Perception in Mathematics Learning (X2) directly affects understanding concepts (Y)
The research hypothesis to be tested is formulated in the form of the following statistical hypothesis.

The basis of decision making is as follows:

Ha	: ρyx2 $= 0$	There is a significant influence of Perception on Mathematical Learning (X2) on Understanding Concept (Y)
Ho	: ρyx2 $\neq 0$	There is no significant influence of Perception On Mathematical Learning (X2) on Understanding Concept (Y)

- If the probability value of 0.05 is smaller than or equal to the sig probability value or [0.05 $\leq$ Sig.] then H0 is accepted and Ha to be rejected is insignificant.
- If the probability value of 0.05 is greater than or equal to the probability value of Sig or [0.05 $\geq$ Sig.] then H0 is rejected and Ha accepted means significant.

Based on the results of calculations in the sig column. in the attachment obtained the value tcalculate $= 4,361 >$ ttable $= 2.0003$, ρyx2 $= 0.462$ sig. Since the value sig.0.000 is less than the probability value of $\alpha = 0.05$, then Ho is rejected and Ha is accepted meaning that the path analysis coefficient is significant. So, there is the influence of perception on learning Mathematics (X2) is significant to conceptual understanding (Y) (Fig. 1 and Table 9).

$$R^2_{yx_1x_2} = 0,386$$

$$\rho_y\varepsilon = 1 - R^2_{yx_1x_2} = 1 - 0,386 = 0,614 = 61,4\%$$
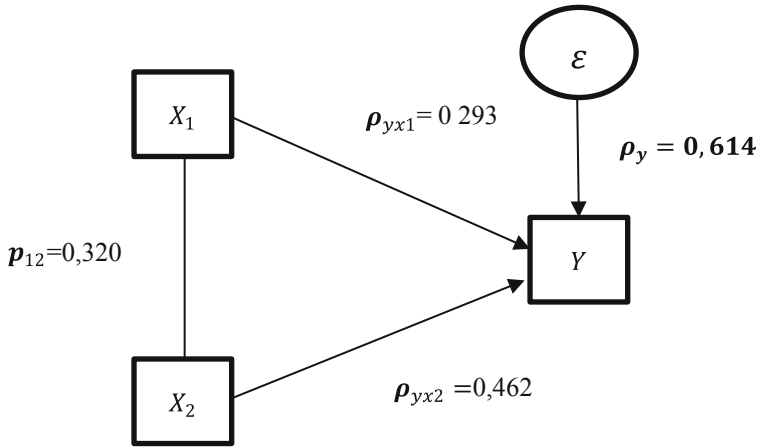
Fig. 1. Diagram of Empirical Causal Relationship Path X1 and X2 against Y

4 Conclusion

Anxiety directly affects the thinking ability of students of junior high school 16 Bengkulu City As big as $\rho_{yx1X1} = 0.293$. This means that the understanding of the concept of students of junior high school N 16 Bengkulu City, is directly influenced by the increase in anxiety or *anxiety*. Perception on mathematics learning has a direct effect on understanding the concept of junior high school students 16 Bengkulu City of $\rho_{yx2X2} = 0.462$. This means that the improvement of the ability to understand the concept of junior high school students N 16 Bengkulu City, is directly influenced by the increase in perception in mathematical learning. *Anxiety* is connected to perception in the learning of mathematics of junior high school students N 16 Bengkulu City State of $\rho_{yx2x1} = 0.320$. This means that if anxiety or anxiety *increases* then the perception in math learning also increases.

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