THE RELATIONSHIP BETWEEN STUDENTS' ANXIETY AND STUDENTS' UNDERSTANDING OF MATHEMATICAL CONCEPTS IN WHOLE NUMBER MATERIAL

Melati Purnama Sari[1], M. Arie Firmansyah[2], Retno Andriyani[3]
Mathematics Education Study Program, Faculty of Teacher Training and Education, University Of Muhammadiyah Tangerang
melatips8600@gmail.com

Abstrak

This writing aims to determine the relationship between student anxiety and understanding of mathematical concepts. This research uses a quantitative approach with a survey method. The analysis used in this survey method is correlation analysis. The population in this study were all VIII grade students of Dharma Siswa Junior High School totaling 207 students. Then the sample studied was 35 students from class VIII D. The selection of this sample class used the *purpose sampling* method. Data collection techniques using non-test instruments (questionnaires) and essay tests. The results of this study indicate that there is a significant negative relationship between student anxiety and understanding of mathematical concepts as much as -0.735, the negative relationship in question is if the level of student anxiety is higher, then the level of understanding of mathematical concepts of students will be lower and vice versa if the level of student anxiety is low, then the understanding of mathematical concepts of students will also increase. The t-test results show that the value of $t_{count} \geq t_{tabel}$ with a value of t_{hitung} 6,227 > $t_{tabel\ (0,05;33)}$ 2.034 then H_0 rejected and H_1 accepted. Thus it can be concluded that there is a relationship between anxiety and understanding of mathematical concepts.

Keywords: *Math Anxiety*, Mathematical Concept Understanding.

INTRODUCTION

Education is a conscious learning process to understand everything that has never been known, understood and learned before. One of the lessons that has an important role in the educational process is mathematics. (Handayani 2016) says mathematics is a universal science that has an important role in various disciplines and develops human thinking. Mathematics is a scientific discipline that has been studied since basic education and helps the development of other disciplines such as physics, chemistry, biology, economics, and others.

One of the places of formal education is the school. Schools as formal education providers always have educational goals that will be a benchmark for the success or failure of schools as education providers. One of the learning sciences in school is mathematics. Based on Permendiknas No. 22 of 2006, one of the objectives of learning mathematics is that students have the ability to understand mathematical concepts, explain the relationship between concepts or algorithms, flexibly, accurately, efficiently, and precisely in problem solving. Thus, concept understanding is the most important part of learning mathematics

which is in line with one of the objectives of education. (Diana, Marethi, and Pamungkas 2020).

According to (Dirgantoro 2018) explains that one of the achievements that students from elementary to high school must have is understanding mathematical concepts, explaining the relationship between concepts and applying concepts or algorithms, skillfully, flexibly, accurately efficiently and precisely in problem solving. According to (Handayani 2019), students need to master mathematical concepts because mathematical concepts have a relationship between one another. Basic concepts must be truly mastered first before learning further mathematics, because if students have understood the concept first, students will more easily accept new material. Then understanding the concept is very necessary in learning mathematics, especially when students find a problem in working on problems. When students find difficulties in working on problems, with the ability to understand good mathematical concepts students can remember and develop basic concepts that have been mastered before so that students can solve these problems.

Understanding of students' mathematical concepts can be achieved if during the learning process there are no inhibiting factors. (Syafri 2017) mentions one of these inhibiting factors is math anxiety. Then (Susanto 2016) explains that mathematics anxiety is a condition where there is a feeling of fear and worry when learning mathematics, mathematics anxiety arises as a response to what is being faced in learning mathematics, mathematics anxiety exists due to students' lack of ability in mathematics, the character of the mathematics teacher, the models and learning methods used, mathematical difficulties and lack of confidence.

Based on the results of observations and interviews of researchers with Mrs. Dila Aulia Fitri, S.Pd as a VII grade mathematics teacher at Dharma Siswa Junior High School, especially integer operation material on Monday, November 28, 2022, it states that only 35% of students are able to understand the material presented by the teacher during learning, while 65% of other students still do not understand the material presented, this is because students do not like mathematics because students think that mathematics is a difficult lesson to understand. This low concept understanding can be seen from the process and results of students in doing the tasks given by the teacher. The researcher also interviewed students who were considered by the teacher to have anxiety while learning, namely there were

students who came in and out when the math lesson was in progress, the student said that he felt dizzy because math lessons really drain the mind in counting and math has many formulas. This is in line with Froggat's opinion in (Mukholil 2018) stating that dizziness is one of the symptoms that arise due to anxiety.

Based on this description, researchers are interested in knowing how much anxiety is related to understanding mathematical concepts, especially integer operation material in VII grade students of Dharma Siswa Junior High School by conducting research on "The Relationship between Student Anxiety and Understanding of Student Mathematical Concepts on Integer Material".

METHODS

This research uses a quantitative approach with a survey method. Sugiyono (2021) states that the survey method is research used to obtain data about beliefs, opinions, characteristics, variable relationships to test several variable hypotheses from samples taken from certain populations.

In order to facilitate the research to be carried out, the research design is practically described regarding "The Relationship between Student Anxiety and Students' Mathematical Concept Understanding" as follows:

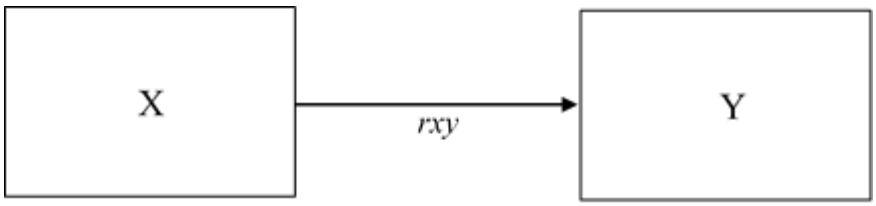

Figure 1. Research Design

The population in this study were 8th grade students of Dharma Siswa Junior High School in semester 2 of the 2023/2024 school year, totaling 207 students. Sugiyono (2021) defines sempel as part of the number and characteristics possessed by the population. Sampling in this study using the purpose sampling method is due to the consideration of the math teacher at Dharma Siswa Junior High School. Lestari and Yudhanegara (2017) explain the purpose sampling method as determining the sample with certain considerations, this is because the researcher adjusts the research needs to be used. The sample in this study were VIII D class students.

The data collection techniques used in this study were tests and non-tests. The test technique was carried out to determine the understanding of mathematical concepts of VIII grade students using integer material. With essay tests students are required to be able to understand mathematical concepts. While the non-test technique given is in the form of a questionnaire, the questionnaire is used to obtain data on the anxiety of VIII grade students. With a questionnaire students are expected to choose answers according to their respective feelings when dealing with math lessons.

The data analyzed were quantitative data in the form of mathematical concept understanding test results and anxiety questionnaire results. Before the research data is processed, it must first prepare several things, including testing the quality of the instrument by testing the validity, reliability, distinguishing power and difficulty index of the instrument.

Furthermore, the data is tested using the Prerequisite Test, namely the Normality Test, the Normality Test is carried out to determine whether the data from the research obtained is normally distributed or not. In the Normality Test, researchers use the SPSS program, then also the Linearity Test to see the relationship between the independent variable and the dependent variable.

Furthermore, the hypothesis test used in this study if the n-gain data is normally distributed, then use the correlation test and t-test. Meanwhile, if one or both of the data normality results are not normally distributed, then use a non-parametric statistical test with the Man Whitney U test (Lestari & Yudhanegara, 2017).

RESULTS AND DISCUSSION

The result of this study is whether or not there is a relationship between student anxiety and understanding of mathematical concepts. The mathematics material used in this study is integer material.

The following are the results of the calculation of the description of the Anxiety Questionnaire data and the Student Mathematical Concept Understanding data:

Table 1. Descriptive Data

No.	Statistics	Hasil	
		Anxiety (X)	Understanding Math concept (Y)
1	Mean	54.48571429	50.08571429
2	Median	54	46

3	Modus	49	33
4	Max	68	79
5	Min	39	25
6	Total	1907	1753
7	Standard Deviation	8.283120429	14.9063181
8	Variance	68.61008403	222.1983193

From the table above, it can be seen that the average of variable X is 54.486 and variable Y is 50.086. The standard deviation value of variable X is 8.283 and variable Y is 14.906. And the variant value for variable X is 68.610 and variable Y is 222.198.

The prerequisite tests and hypothesis tests that have been carried out are as follows:

Table 2. Normality test of Anxiety Questionnaire data

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Kecemasan	.105	35	.200*	.962	35	.271

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the table above, it can be seen that the results of the normality test calculation using *shapiro-wilk* obtained that the significant value> 0.05. This indicates that the data is normally distributed.

Table 3. Normality Test of Student Mathematical Concept Understanding data

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pemahaman Konsep	.151	35	.042	.941	35	.059

a. Lilliefors Significance Correction

Based on the table above, it can be seen that the results of the normality test calculation using shapiro-wilk obtained that the significant value> 0.05. This indicates that the data is normally distributed.

Table 4. Linearity Test

ANOVA Table

			Sum of Squares	Df	Mean Square	F	Sig.
Pemahaman Konsep * Kecemasan	Between Groups	(Combined)	6290.410	22	285.928	2.714	.038
		Linearity	4086.345	1	4086.345	38.784	.000
		Deviation from Linearity	2204.065	21	104.955	.996	.522
	Within Groups		1264.333	12	105.361		
	Total		7554.743	34			

Based on the results of the linearity test, it is known that the Sig. *Deviation From Linearity* is 0.522. Because the result of Sig. 0.522 > 0.05, it can be concluded that there is a significant linear relationship between anxiety and understanding of mathematical concepts.

Table 5. Correlation Test

Correlations

		Kecemasan	Pemahaman Konsep
Kecemasan	Pearson Correlation	1	-.735**
	Sig. (2-tailed)		.000
	N	35	35
Pemahaman Konsep	Pearson Correlation	-.735**	1
	Sig. (2-tailed)	.000	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the correlation test results, it can be seen that the Pearson Correlation value is - 0.735, meaning that there is a strong relationship between anxiety and understanding of mathematical concepts. Then there is a negative sign which means there is a reverse relationship where the higher the anxiety in students, the lower the understanding of mathematical concepts and vice versa.

Then to test a hypothesis rejected or accepted and the level of relationship closeness can be done with the t-test as follows:

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

$$= \frac{0{,}735\sqrt{35-2}}{\sqrt{1-0{,}735^2}}$$

$$= 6{,}227$$

$t_{tabel\ (0{,}05;33)}$ = 2,034

So that t_{hitung} 6,227 > $t_{tabel\ (0{,}05;33)}$ 2,034. Then H_0 rejected, meaning that there is a relationship between anxiety and understanding of mathematical concepts.

Table 6. Determination Coefficient Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.735[a]	.541	.527	10.252

a. Predictors: (Constant), Kecemasan

b. Dependent Variable: Pemahaman Konsep

Based on the table above, it shows that the *Adjusted R Square* value is 0.527 or 52.7%, meaning that there are 47.3% of understanding of mathematical concepts that are influenced by other factors.

CONCLUSION

Conclusion

Based on the results of the research that has been carried out, it shows that:

1. There is a significant relationship between student anxiety and mathematical concept understanding of -0.735.
2. The t-test results show t_{hitung} 6,227 > $t_{tabel\ (0{,}05;33)}$ 2,034. Then H_0 rejected, meaning that there is a relationship between anxiety and understanding of mathematical concepts.

Suggestion

Based on the results of this study, the following suggestions are made:

1. It is expected that teachers can create an interesting and interactive learning atmosphere in order to minimize the level of anxiety in students and can improve understanding of mathematical concepts.

2. It is expected for parents to always check, guide and control student learning activities both learning activities at school and learning activities at home.
3. It is expected for students to always try and repeat the material that has been delivered by the teacher so that students can understand the material and can reduce the level of anxiety when learning math.
4. It is expected for future researchers to try to use materials other than integers and use other variables or even add variables used for research, in order to add types of research as a source of reference.

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