THE EFFECT OF MATH ANXIETY ON STUDENT LEARNING OUTCOMES WHEN LEARNING RETURNS TO NORMAL IN SMA NEGERI 1 RANDUDONGKAL

Dias Kurniasih Fajri[1], Nofita Sari[2], Muhammad Anugerah[3], Fina Rizqi Kamila[4], Nurul Husnah Mustika Sari[5], Herani Tri Lestiana[6]

IAIN Pekalongan

diaskurniasihfajri@gmail.com, snofita36@gmail.com, muhammadanugerah87@gmail.com, finarizqikamila@gmail.com, nurul.husnah.ms@iainpekalongan.ac.id, h.t.lestiana@gmail.com

ABSTRAK

Hasil belajar siswa pada mata pelajaran matematika di pembelajaran jarak jauh selama masa pendemi Covid-19 menurun drastis. Salah satu faktor utama penurunan nilai tersebut adalah pengaruh kecemasan. Kecemasan itu hadir ketika siswa mendapatkan banyak tugas, akibatnya siswa tidak mampu mengerjakan soal karena tidak dapat memahami materi. Namun, saat ini pembelajaran sudah kembali normal. Siswa sudah 100% melakukan pembelajaran tatap muka. Kehadiran guru dapat dirasakan secara nyata sebagai pendamping siswa memahami materi matematika. Penelitian ini memiliki tujuan untuk mengetahui pengaruh kecemasan matematika terhadap hasil belajar siswa saat pembelajaran kembali normal di SMAN 1 Randudongkal. Pengaruh kecemasan matematika tersebut dapat dilihat dari beberapa aspek diantaranya mengerti/pemahaman matematika, somatik, kognitif, dan tingkah laku. Penelitian ini merupakan penelitian kuantitatif dengan metode *survey*. Data diperoleh melalui angket kecemasan dan tes hasil belajar yang telah divalidasi. Sampel dalam penelitian ini adalah siswa kelas XI jurusan MIPA SMA Negeri 1 Randudongkal yang diambil

secara *random sampling* yaitu sebanyak 59 siswa. Hasil penelitian menunjukkan bahwa tidak ada pengaruh signifikan kecemasan matematika terhadap hasil belajar. Hal ini dapat dilihat dari nilai signifikansi pada analisis regresi sebesar 0.675<0.05.

 Kata Kunci : Kecemasan, Daring, Hasil Belajar Matematika

ABSTRACT

Student learning outcomes in mathematics subjects in online learning during pandemic covid-19 decrased drastically. One of the main factors of the decline in the value is the influence of anxiety. Anxiety is present when student get a lot of assignment as a result are unable to work on questions because they cannot understand the material. However, now learning has returned to normal. Students have 100% done offline learning. The presence of the teacher can be felt significantly as a companion for students to understand mathematical material. This study aims to determine the effect of mathematics anxiety on student learning outcomes when learning returns to normal at SMA Negeri 1 Randudongkal. The influence of math anxiety can be seen from several aspects including aspects of understanding / Mathematics knowledge, somatic, behavioral. This research is a quantitative research with survey method. Data were obtained through anxiety questionnaires and learning outcomes tests. Both instruments have been validated. The sample in this study were students of class XI majoring in Mathematics and Natural Sciences at SMA Negeri 1 Randudongkal which were taken by random sampling as many as 59 students. The results showed that there was no significant effect of math anxiety on learning outcomes. This can be seen from the significance value in the regression analysis that is 0.675 <0.05.

Keywords *: Anxiety, Offline, Math Learning Outcomes*

INTRODUCTION

The Covid-19 pandemic has had a huge impact in Indonesia. This impact forces all activities or work to be done from home. The teaching and learning process that was originally offline to be online for at least 2 years is also the impact of the pandemic so that the virus does not spread easily. The pandemic in Indonesia is now starting to be controlled and schools can return to their activities with offline learning. However, the impact of the Covid-19 pandemic, such as online learning, still affects students. This influence can be felt in the field of education, especially mathematics.

Many children are afraid of math subjects. This fear causes a condition called mathematical anxiety. Mathematical anxiety is the state of the students who are frightened and worried about math studies(Fadilah & Munandar, 2019). Another research anxiety is an uncomfortable feeling that often occurs in everyday life-a human day(Saputra, 2014). Math anxiety prevails among adolescents and is a determiner of their future.

Mathematics anxiety is a feeling of tension, helplessness, mental disorganization and a person's fear that arises when faced with the problem of manipulating numbers and forms of problem solving (Zakaria & Nordin, 2008). Stated that anxiety involves feelings of tension and anxiety that affect various ways of solving math problems in real life and academics. Meanwhile, Bursal and Paznokas said that mathematics anxiety is a state of helplessness and panic when asked to do mathematical tasks(Gresham, 2010).

The condition of the student concerned about math anxiety can adversely affect the learning outcomes. According to Nana Sudjana, learning outcomes are a must or activity that can be achieved by students after learning designed and implemented by teachers in a particular school and class. In line with that, learning outcomes are abilities possessed by students after receiving learning experiences (Nasution et al., 2017). Adapted from Sudjana defines, "Student learning outcomes are essentially changes in behavior as a result of learning in a

broader sense covering the cognitive, affective, and psychomotor fields" (Hasibuan, 2015).

Based on the results of research conducted involving 15 students of class VIII in one of the junior high schools in Karawang, it can be concluded mathematical anxiety has a negative impact on mathematical synthesis ability (Wulandari & Lestari, 2022). Meanwhile the study concluded that the obstacles in the learning process of mathematics experienced by students are mathematics anxiety factors in the form of feelings of tension, anxiety, and fear (Julya et al., 2022). Based on the explanation above, we want to know if the anxiety that arises when learning mathematics affect to learning outcomes.

DISCUSSION

This is a quantitative research. The population in this study is students from five classes of XI MIPA SMA Negeri 1 Randudongkal. By using simple random sampling method, it is obtained 59 students as a sample.

The instruments that used in this study are anxiety questionnaire and learning outcomes test. Adapted from Cooke suggested that the indicators of mathematics anxiety consisted of 4 components, namely understanding, somatic aspects, cognitive aspects, and behavioral aspects (Dzulfikar, 2016).

In understanding aspects, mathematics knowledge/understanding relates to things such as the emergence of thoughts that he does not know enough about mathematics. Whilst somatic relates to changes in the state of the individual's body, for example the body sweats or the heart beats fast. On the other hand, according to several researchers who agree that math anxiety includes cognitive aspects (Purnomo & Suci, 2016). According to Nolen-Hoeksema, Stice, Wade & Bohon symptoms of math anxiety from the cognitive aspect, namely anxiety related to cognitive factors, including: disturbed concentration, worry, likes to think (confused) (Huda et al., 2021). Meanwhile, according to Anggreini cognitive symptoms such as being pessimistic about being unable to do

math problems, worrying or unsure about their own math work (Zahro & Purwaningsih, 2018). The last, behavioral aspects, mathematics anxiety is from behavioral aspects such as avoiding math lessons (Ekawati, 2015).

On the mathematical anxiety instrument, the researcher distributed a Likert scale questionnaire using a google form containing 16 statements related to math anxiety. The following is presented data validity test and reliability result of mathematics anxiety instrument.

Table 1.
The Validity Test to The Level of Student Mathematical Anxiety

Statement	Significant	Correlations	Information
item 1	0.00	0.562**	Valid
item 2	0.00	0.713**	Valid
item 3	0.00	0.656**	Valid
item 4	0.00	0.629**	Valid
item 5	0.00	0.659**	Valid
item 6	0.00	0.655**	Valid
item 7	0.00	0.649**	Valid
item 8	0.00	0.776**	Valid
item 9	0.30	0.283*	Valid
Item 10	0.00	0.644**	Valid
item 11	0.00	0.553**	Valid
item 12	0.00	0.447**	Valid
item 13	0.196	0.137	Invalid
item 14	0.05	0.640**	Valid
item 15	0.00	0.360**	Valid
item 16	0.21	0.300*	Valid

*Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

In the Table 1, the significance of every item is less than 0.05 excepts item 13. It means, all statements are valid, except statement 13. Then, statement 13 is removed as it is tested invalid.

Then the mathematics anxiety instrument that only consists of total 15 items was tested again with the result all of the items are valid because each item X shows the $0 < 0.5$ signs. The result can be seen in Table 2. From Table 2 also correlated each item X with correlation > 0.3 so it can be inferred data from each ID is proven valid.

Table 2.

The Validity Test to The Level of Student Mathematical Anxiety after Item 13 is removed

Statement	Significant	Correlations	Information
item 1	0.00	0.562**	Valid
item 2	0.00	0.713**	Valid
item 3	0.00	0.656**	Valid
item 4	0.00	0.629**	Valid
item 5	0.00	0.659**	Valid
item 6	0.00	0.655**	Valid
item 7	0.00	0.649**	Valid
item 8	0.00	0.776**	Valid
item 9	0.30	0.283*	Valid
Item 10	0.00	0.644**	Valid
item 11	0.00	0.553**	Valid
item 12	0.00	0.447**	Valid
item 14	0.05	0.640**	Valid
item 15	0.00	0.360**	Valid
item 16	0.21	0.300*	Valid

*Correlation is significant at the 0.05 level (2-tailed)

The mathematics anxiety instrument that consists of 15 items then tested for the reliability. The result can be shown in Table 3.

Table 3
Reality Test Results to A Level ff Student Mathematical Anxiety

Reliability Statistics

Cronbach's Alpha	N of Items
.856	15

The instrument is reasonalized when the coefficient of reability is at least 0.6 (Cronbach's Alpha > 0.60) (Sugiyono, 2015). The results of the reality in Table 3 obtained the cronbach's Alpha value of 0.856. So it can be concluded that mathematics anxiety instrument is reliabel.

While for the learning outcomes instrument, it consists of questions regarding the newly learned material, namely derivatives. Table 4 showed the tes validity of each question in learning outcomes instrument.

Table 4
Test the validity of student learning outcomes

Statement	Significant	Correlation	Information
item 1	0.00	0.566**	Valid
item 2	0.00	0.665**	Valid
item 3	0.029	0.285*	Valid
item 4	0.00	0.547**	Valid

item 5	0.00	0.452**	Valid
item 6	0.046	0.261*	Valid
item 7	0.00	0.616**	Valid
item 9	0.00	0.721**	Valid
item 10	0.020	0.302*	Valid

On the chart above question item 8 is removed because when tested using a SPSS significant value 0.05 therefore invalid. Then learning outcomes instrument that consists of 9 question is validity tested again. The result can be seen in Table 5. The output of the SPSS shows that the correlation between each indicator (item 1, item 2, item 3, item 4, item 5, item 6, item 7, item 9, and item 10) to the total constructive score shows significant results. So it can be concluded that each question indicator is valid.

Table 5
The Validity of Student Learning Outcomes

Statement	Significant	Correlation	Information
item 1	0.00	0.566**	Valid
item 2	0.00	0.665**	Valid

item 3	0.029	0.285*	Valid
item 4	0.00	0.547**	Valid
item 5	0.00	0.452**	Valid
item 6	0.046	0.261*	Valid
item 7	0.00	0.616**	Valid
item 8	0.517	0.084	Invalid
item 9	0.00	0.721**	Valid
item 10	0.020	0.302*	Valid

The learning outcomes instrument then tested for reliability. The result is shown in Table 6. From Table 6, cronbach's alpha=0.636 > 0.60. So the learning outcomes instrument is reliabel.

Table 6
Results of the Realibitory Test for Student Learning Outcomes Reliability Statistics

Cronbach's Alpha	N of Items
.636	9

Construct has met the validity test then the constructs will also reliable, but otherwise a reliable construct is not necessarily valid .

Regression Analysis

Before repressive analysis, it should first meet the OLS (ordinary

Least Squares) assumption of regression or often called the classic assumption that makes the estimate of OLS the best linear (Gujarati, 2012). There are three components to note in regression analysis, which is the r-purpose determinations (R-squares) significance of the F test, and the significance of the T test.

Based on the data of the two variable sanxiety (X) and the results of mathematical studies (Y) as many as 59 at SMA Negeri 1 Randudongkal may be conducted simple regression analysis and data obtained as follows.

Table 7
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.056[a]	.003	-.014	18.783

a. Predictors: (Constant), anxiety

The output in Table 7 explains the magnitude of correlation / relationship (r) of 0.056 of the output is obtained by the coefficient of determination of 0.003 which contains the understanding that the effect of free variable (mathematical anxiety) to the bound variable (learning outcome) is 0.3%.

Tabel 8. ANOVA

Model	Sum of Squares	Df	Mean Square	Sig.
1 Regression	62.521	1	62.521	.675[b]
Residual	20110.360	57	352.813	
Total	20172.881	58		

a. Dependent Variable: learning outcomes

b. Predictors: (Constant), anxiety

Tabel 9
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	44.166	12.490		3.536	.001
anxiety	.120	.285	.056	.421	.675

a. Dependent Variable: learning outcomes

Based on the output in Table 9 ANOVA is known that F = 0.177 with

significant level of $0.675 > 0.05$. it means the regression model is not significant. In other word, there is no influence of mathematical anxiety (X) to the learning outcomes (Y).

This has been reinforced by interviews at SMA Negeri 1 Randudongkal. The interviews were obtained from three respondents including one respondent who had high anxiety and high learning outcomes, one respondent with low learning outcomes and low anxiety levels, and one respondent with moderate learning outcomes and moderate anxiety levels. From the interview, it is known that students who feel anxious about mathematics subjects tend to be more diligent in studying so that the value of learning outcomes shows satisfactory results. Meanwhile, students who have learning outcomes that show low scores do not feel anxious about math subjects so there is no more interest in learning mathematics. Meanwhile, for students who have moderate grades on learning outcomes and moderate levels of anxiety, students learn mathematics as necessary according to what is taught by the teacher but there is no deeper intention to learn mathematics.

The level of anxiety does not always affect the cognitive outcomes of or learning outcomes. For example, a study involving 96 biology education students, concluded that the results showed that students had moderate levels of anxiety in facing the Mid-Semester Examination (Suratmi et al., 2017). Most of the students have sufficient learning outcomes in studying the Biology Process Evaluation and Learning Outcomes course. So the conclusion is that there is no significant relationship between the level of anxiety facing exams with student learning outcomes of the Untirta Biology Education Study Program.

Research which involved 123 students of SMP Negeri Urumb also concluded that the results showed that mathematics anxiety had a significant indirect effect on students' mathematics learning outcomes through metacognitive awareness (Nur'aini et al., 2021). So the conclusion is that there is no significant relationship between the level of mathematics

anxiety and the mathematics learning outcomes of Urumb State Junior High School students.

CONCLUSSION

Based on data analysis and a discussion of the mathematical anxiety over the students' learning subjects from the 11th grade with random sampling, it can be concluded that there was no significant effect of mathematics anxiety on mathematics learning at SMA Negeri 1 Randudongkal. It is proven by regression that indicates that math anxiety has a positive effect but does not significant because the significancy of regression model is 0.675 that is more than 0.05.

This study only discusses there is no effect between mathematical mechanical variables with learning outcomes, is expected to exist further research on other factors that can affect the learning outcomes of mathematics learners. So the student learning outcomes can be controlled because it already knows the factors that influence it.

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