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RESEARCH ARTICLE

Psichological Disposition of Student; Mathematics Anxiety Vesus Happines Learning on the Level Education

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ABSTRACT

The purpose of this study is to analyze students' psychological dispositions about student learning anxiety and happiness on the level of education. Elementary school, Junior high school and Senior High School students in the city of Cirebon were the subjects in this study. Mixed methods research with a sequential transformative strategy model was chosen to answer the problem of this research. Through a stratified random sampling technique, two types of research data were obtained; quantitative and qualitative data. Both of these data were analyzed by two data analysis techniques. Quantitative data analysis used is chi-square and contingency correlation, while qualitative data analysis uses triangulation of data sources. The results showed that there were differences in the level of mathematics anxiety and learning happiness of students at each level of education. Senior High School students have a high level of math anxiety when compared to elementary and Junior high school students. While in terms of happiness learn, students the elementary school is happier learning when compared to the other two types of students. This condition is also strengthened by the existence of a significant relationship between mathematics anxiety and happiness learn student with the level of education

1. INTRODUCTION.

The International Commission for 21st Century Education formed by UNESCO reported that this global perception of education was carried out by relying on four pillars of education, namely learning to know, learning to do, learning to be, and learning to live together (Delors, 1996). Learning to know is that students learn important knowledge in accordance with the level of education that is followed, learning to do, namely students develop skills by combining mastered knowledge with practice, so that skills are formed that enable students to solve problems and life challenges, learning to be, namely learners gradually learn to be intact individuals understand the meaning of life and vice versa done in order to live well, and learning to live together that students can understand the meaning of living with others, by respecting, respecting, and understanding mutual dependence.

Entering the 21st century, in Indonesia, a new paradigm has developed in the field of education. According to Wijaya, Sudjimat, Nyoto & Malang (2016), there are 3 trends in the implementation of the national education system, namely (1) shifting focus from the teaching process to the learning process, (2) flexible curriculum, (3) educational autonomy. Education that is more focused on the learning process than the teaching process is certainly intended to improve the quality of students. While education autonomy and curriculum flexibility are intended so that each educational institution can adjust to educational performance competencies and objective conditionality in the field. (Maba, 2017).

Likewise mathematics, as one of the compulsory subjects that must be given in schools, so that the teaching can be effective and effective, the psychological symptoms of students need to be considered, according to the situation and conditions of development of students (Resnick & Ford, 2012). The teacher has the main role in monitoring students' psychological/mental development during the learning process (Pianta, 1999).

Mathematics learning is a process of providing learning experiences about mathematics to students through planned activities prepared by educators (Steffe, 2012). In learning mathematics, the teacher must provide opportunities for students to try and find their own experiences regarding the mathematical objects that are being studied. According to Burton (2012), The purpose of learning mathematics is to encourage students to become problem solvers based on a critical, logical and rational thinking process.

There are many reasons for the need for students to study mathematics. One reason why mathematics is studied is because it is useful, both in everyday life and as a language and tool in the development of science and technology (Sembiring, 2014). Almost all fields of study require appropriate mathematical skills (Freudenthal, 2012). Mathematics is a powerful, concise and clear means of communication, mathematics can be used to present information in various ways. Mathematics can improve the ability to think logically, thoroughly, and awareness of space and

mathematics can provide satisfaction with the effort to solve challenging problems (Beth & Piaget, 2013).

Based on the description, it can be stated that mathematics is useful and closely related to all aspects of human life, especially for students. But ironically, mathematics is one of the subjects that is considered difficult for some students (Gafoor & Kurukkan, 2015). This negative assumption is growing with the increase in graduation standards in the school year 2016/2017. As for the results of the National Exam (UN) in the academic year 2015/2016. The evaluation results show a decrease in the average value of 6.04 points. These conditions appear to be very contrasting with differences (decreases). Because the evaluation results in 2015 were 56.28, while this year it was 50.24. Whereas for other subjects in 2016; Indonesian (70.75), English (57.17) and Natural Sciences (56.27). (Mendikbud, 2016).

The decline in the results of the National Examination on mathematics subjects indicated one of the contributing factors, namely mathematics anxiety. Mathematics anxiety is a response to situations that are full of stress experienced by students when learning mathematics. Stress can be defined as the perception of threats to expectations that trigger feelings of anxiety both physically and psychologically. As a result, students will learn to relieve behavior because they experience various negative psychological symptoms (Mujtaba & Reiss, 2013).

Student learning anxiety can be related to achievement and learning outcomes in mathematics at school (Seng, 2015; Erzen, 2017). With mathematics learning anxiety experienced by students can have a negative effect on students' psychology (Godbey, 1997), so that the concentration and understanding of learning material can be disrupted. Disturbed psychological conditions can be a domino effect on poor student learning outcomes. (Wang et al., 2015).

On the other hand, there are differences in the level of mathematical anxiety between male and female students (Mutodi & Ngirande, 2014; Pourmoslemi, Erfani, & Firoozfar, 2013). Mathematical anxiety can also be caused by the teacher's poor teaching strategy (Sloan, Daane, & Giesen, 2006). Apart from that, teacher psychology also influences students' mathematics learning outcomes, where female teachers experience anxiety more than male teachers (Stoehr, 2017). So that the teacher's ability to innovate in mathematics learning is needed. one of them is the use of music media can have a positive effect on decreasing mathematical anxiety. music media can make students relax and calm in learning mathematics(Gan, Lim, & Haw, 2016).

Psychological calm and the achievement of student learning goals can have implications for student learning happiness. Comfortable and enjoyable learning is needed by students. For example, out-of-class learning/Outbound can have a positive impact on personality formation, even student learning attitudes (Can et al., 2017). Even the happiness of learning can be modeled mathematically-geometry (Satsangi & Sinha, 2012). According to Smith (2010), happy students can do mathematical performance well. where differences in geographical conditions, socio-economic students have little impact on mathematical performance. Most students can do a mathematical performance by habituation done by teachers in mathematics learning in class.

Based on these concepts and phenomena, the urgency in his research is to analyze students' psychological dispositions about mathematical anxiety and student learning happiness. This research was built, based on students can experience psychological symptoms in the form of mathematical anxiety. In addition, students can also experience the turmoil of happiness learn in mathematics learning at school. The factors that influence the psychological condition of students, as well as the analysis of the relationship between math anxiety and happiness learn student with differences in the level of education, are the priorities of this study.

2. RESEARCH METHOD

The study was conducted at every level of education in Cirebon City-Indonesia. The level of education studied starts from Elementary School (SD), Junior high school (SMP), and Senior High School (SMA). The basis for this consideration was chosen because the focus of the study emphasized changes in students' mental development based on different levels of education.

The research approach used is Mixed Methods Research with the Sequential Transformative Strategy model (Terrell, 2012). Where this research method uses a mixture of quantitative and qualitative approaches (Creswell & Creswell, 2017). The basis for considering the choice of the research method is centered on fundamental questions in research and not solely oriented towards research methods. Mixed methods for data collection are carried out in order to obtain answers about the problem under study. So as to obtain a comprehensive research problem analysis.

2.1 Participan

Research is divided into two stages; quantitative and quality research. In the Quantitative research stage, the research population is divided into two types; the target population and affordable population (Bhattacherjee, 2012). The target population is all students who attend school in the city of Cirebon. While the population is affordable, namely Elementary School , Junior high school, and Senior High School students in the city of Cirebon. The sampling technique used is Stratified Random Sampling. (Kothari, 2009; Kadilar & Cingi, 2003). Where the sampling process is done randomly at representations at each level of education. The following details are used as research samples.

Table 1. Distribution of Research Samples

Level of education	Educational institution	Total
SD	SDN Silih Asah I	80
	MI Salafiyah Huda	85
SMP	MTs Syarif Hidayatulloh	82
	MTs Darul Masoleh	83
SMA	SMA N 1 Cirebon	75
	MA Darul Masoleh	90
Quantity Research Samples		495

While at the qualitative research stage, the subject of the research was representation of students who experienced various types of mathematical anxiety and types of learning happiness. The object of the research is focusing on math anxiety and the learning section of students in school mathematics learning activities.

2.2 Data Collection

The type of data in this study consists of quantitative data and qualitative data. Quantitative data was obtained from scores on mathematics anxiety questionnaires and student learning happiness. While qualitative data are in the form of data from interviews, observations and expert judgment.

The research instruments used were observation guidelines, interview guidelines, and questionnaires (mathematics anxiety and learning happiness) with a 4 likert scale choice (Nemoto & Beglar,

2014). Where the four choices in the questionnaire consist of; Very Appropriate (SS), Appropriate (S), Not Appropriate (TS), Very inappropriate (STS).

Mathematical anxiety of students in this study was measured through data from the questionnaire using a Likert scale. where the mathematics anxiety questionnaire was developed by researchers from the indicator of the Taylor Manifest Anxiety Scale (TMAS) (Taylor, 1953). Whereas student learning happiness is measured through questionnaire dissemination data developed by researchers adopting a scale of Subject Welling-Being (SWB) (Seligman, 2004).

The analysis technique of the research instrument used consisted of 2 stages; (1) Test the validity of research instrument indicators using Confirmatory Factor Analysis *(Mulaik, 1988), (2)* Test the validity and reliability of the instrument using expert judgment. The results of expert judgment were then analyzed using the CVR formula to obtain the index ratio validity with a reliability of research instruments using the Cronbach Alpha formula (Gliem & Gliem, 2003).

2.3 Data Analysis

The analysis was carried out into 2 types of research data. First, quantitative data analysis in the form of data on mathematics anxiety and learning happiness were analyzed by chi-square and contingency correlation (O'Mahony, 2017). But before testing hypotheses, prerequisite testing is needed which includes the normality test and homogeneity test. Second, qualitative data analysis uses triangulation of data sources (Denzin, 1997). The second analysis technique is needed to explore the depth of information related to math anxiety and student learning happiness through observation and interviews on the subject of the study.

3. RESULT AND DISCUSSION

3.1 Mathematical Anxiety of Student

According to Ashcraft & Krause (2007), Mathematical anxiety is a feeling of tension, anxiety or fear that disrupts mathematical performance. Feelings of stress and anxiety can interfere with the manipulation of mathematical problems both in daily life and in the academic life of students (Richardson & Suinn, 2003). Where students' math anxiety can be detected through 3 symptoms experienced; 1). Physical symptoms such as increased heart rate, sweaty hands, and abdominal pain, 2). Psychological symptoms such as: unable to concentrate and feeling helpless, worry and disgrace/shame, and 3). Behavioral symptoms such as: avoid math classes, are reluctant to complete math assignments and do not study mathematics regularly (Blazer, 2011)

The results gathered from this study which aims to describe students' mathematics anxiety and learning happiness based on differences in levels of education in the city of Cirebon-Indonesia. The research data relating to mathematics anxiety was obtained from the Mathematics anxiety questionnaire which amounted to 20 statement items distributed to 495 students at various levels of education in Cirebon City. As for the processing of the results of the contingency are as follows.

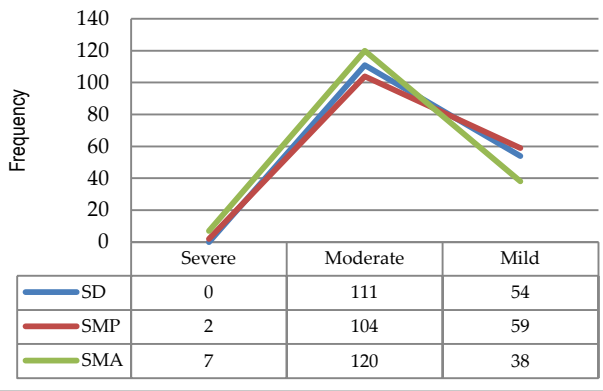
Table 2. Contingency - Mathematics Anxiety

Type of Mathematical Anxiety	Level of Education			Total
	SD	SMP	SMA	
Severe	0	2	7	9
Moderate	111	104	120	335
Mild	54	59	38	151

Through the mathematics anxiety questionnaire tested, the research data in table 2 shows data on the results of mathematics anxiety contingency students at each level of education starting from SD, SMP, and SMA of Cirebon City. Most students experience moderate category math anxiety (∑SD=111; ∑SMP=104; ∑SMA=120). This is based on the division of levels of anxiety according to Stuart (2014), that the level of mathematics anxiety is divided into 3 levels; Severe anxiety, moderate anxiety, and mild anxiety.

Whereas if seen from the tendency of mathematics anxiety with the level of student education, Figure 1 shows that students at the level of high school education experience more math anxiety, when compared to students in the levels of SD and SMP. This is in line with some of the results of research that state that student mathematics anxiety occurs more in students who attend school at the middle and high education level (Beilock & DeCaro, 2007; Ramirez, Gunderson, Levine, & Beilock, 2013).

Figure 1. Proportion of mathematical anxiety



This condition can occur, because most of SMA students sometimes address the exam as a problem in their lives, he will feel very embarrassed because he did not get good grades and felt unsure of the preparation he had. Feelings of fear or tension in solve of a problem are called Mathematics anxiety.

Table 3. Crosstabulation-Mathematics Anxiety

			Type of Mathematical Anxiety			Total
			Mild	Moderate	Severe	
Level of Education	SD	Count	54	111	0	165
		Expected Count	69,3	92,7	3,0	165,0
		% within Type of Mathematical Anxiety	19,4%	53,4%	0,0%	33,3%
	SMP	Count	59	104	2	165
		Expected Count	69,3	92,7	3,0	165,0
		% within Type of Mathematical Anxiety	28,4%	37,4%	22,2%	33,3%
	SMA	Count	38	120	7	165
		Expected Count	69,3	92,7	3,0	165,0
		% within Type of Mathematical Anxiety	18,3%	43,2%	77,8%	33,3%
Total		Count	208	278	9	495
		Expected Count	208,0	278,0	9,0	495,0
		% within Type of Mathematical Anxiety	100,0%	100,0%	100,0%	100,0%

Table 4. Chi-square tests - mathematical anxiety

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	74,990[a]	4	,000
Likelihood Ratio	77,682	4	,000
Linear-by-Linear Association	69,932	1	,000
N of Valid Cases	495		

a. 3 cells (33,3%) have expected count less than 5. The minimum expected count is 3,00.

Furthermore, the results of the Crosstabulation analysis of students' mathematical anxiety. In table 3 shows that students with mild math anxiety (SD=19,4%; SMP; 28,4%, SMA=18,3%), students with moderate math anxiety (SD=53,4%; SMP=37,4%; SMA=43,2%). and students with severe anxiety (SD=0%; SMP=22,2%; SMA=77,8%).

Hypothesis testing is also done through Pearson Chi-Square. Table 4 shows the Asmp value. Sig (0,000). With the magnitude of the Asmp Value. Sig (0,000 <0,050), it can be concluded that Ha is accepted, which means that there is a significant relationship between mathematics anxiety of students with education level. The higher the level of education of students is most likely to experience mathematical anxiety.

The next phase of this research uses Colaizzi's strategy to explain descriptive qualitative phenomenology(Shosha, 2012). Where the process of data analysis involves starting from merging, Connecting, Building, Embedding, and Mixed so as to obtain comprehensive research data. The following are some examples of statements of representation from each level of mathematical anxiety at the level of education.

Math Anxiety Level	Description
Mild	"I sometimes start to worry if tomorrow there will be a math test. To anticipate this, then the night before I studied harder than usual days "(SD-005). “The fear of mathematics began when I heard that the math teacher was fierce! but when the learning passed, I felt was not worried about it "(SMP-054) "Only one subject I feared did not pass the National Examination (UN) later, namely mathematics, hupsstt ,," (SMA-023)
Moderate	"When the math teacher told me to answer math questions in front of the class, my heartbeat was pounding" (SD-088) "My hands sweat when the teacher approaches to see the results of my math work (answering practice questions)" (SMP-75) "I have difficulty concentrating in learning mathematics, because I still remember my math performance which is always bad" (SMA-016)
Severe	"I didn't want to go to school before, because on that day there was a math lesson" (SMP-105) "I chose to go home early (not according to school time) because there would be mathematics" (SMA-143)

Based on the interview data in table 5, the research subjects (SD-005; SMA-023;) were more directed at math anxiety in terms of learning readiness. (Janus & Duku, 2007). Another case in the research subject (SMP-054; SD-088), student mathematics anxiety was more directed at negative perceptions of mathematics teachers. Kunter et al., (2008) explained that this must be realized by students in learning mathematics, building positive perceptions of mathematics teachers can increase enthusiasm for learning mathematics. Whereas the cases in the research subjects (SMP-073; SMA-016) were more directed at mathematics anxiety in students' metabolic and physical impairments (Rawson, Bloomer, & Kendall, 1994). Because that anxiety, stress and even depression itself can have an impact on students' physical health. Another the cases in the research subjects (SMP-105; SMA-143) are more likely to be caused by fear of mathematics or confidence in their potential. (Hoffman, 2010).

3.2 The happiness of student learning

According to Franken (2007), happiness as a way of making reasonable progress steps to realize a learning goal. happiness Learn is a form of interaction between students and their learning environment (Trautwein, Lüdtke, Köller, & Baumert, 2006). The happiness of student learning in this study was measured through the results of the distribution of instruments using the scale of the Subject Welling-Being (SWB).

The scale of Subject Welling-Being (SWB), is a measurement with a series of questions about how students conduct an evaluation of their lives in affection and related cognitions about happiness. Student learning happiness instruments are developed by researchers through a combination of SWB scale and Obien learning concepts (Armetta, 2011; O’brien, 2008).

Likewise, the research data relating to learning happiness student was obtained from a questionnaire which amounted to 20 items statement distributed to 495 students at various levels of education in the city of Cirebon. The process of contingency results is as follows.

Table 6. Contingency – the happiness of student learning

Type of happiness Learn	Level of Education			Total
	SD	SMP	SMA	
Very Happy	30	5	-	35
Fairly Happy	128	108	65	301
Not Happy	7	52	100	159

Table 6 Showing data on contingency learning happiness of students at each level of education starting from SD, SMP and SMA in the city of Cirebon. Data The results of the study show that most students experience Fairly Happiness ($\sum$ SD = 128 Students; $\sum$ SMP = 108 Students; $\sum$ SMA = 65 students). This is based on the categorization of the level of happiness learn through a statistical approach to the rules of Sturges (frequency distribution) (Sturges, 1926; Kumaidi & Manfaat, 2013). Where the results of the frequency distribution are divided into three levels; Very Happy,

Fairly Happy, and Not Happy.

Whereas if seen from the tendency at the level of student education. Figure 2 shows that students at the elementary school level experience happiness learning in mathematics learning in school, when compared with students at the junior and senior high school level.

Figure 2. Proportion of learning happiness

The results of the Crosstabulation analysis of students' learning happiness. Table 7 shows that students with a not happy level (SD = 4.4%; SMP; 32.7%, SMA = 62.9%). Students with Fairly Happy level (SD = 42.6%; SMP = 35.9%; SMA = 21.6%). While the level of Very Happy (SD = 85%; SMP = 33.3%; SMA = 0%).

Table 7. Crosstabulation- the happiness of student learning

			Type of happiness Learn			Total
			Not Happy	Fairly Happy	Very Happy	
Level of Education	SD	Count	7	128	30	165
		Expected Count	53,0	100,3	11,7	165,0
		% within Type of happiness Learn	4,4%	42,5%	85,7%	33,3%
	SMP	Count	52	108	5	165
		Expected Count	53,0	100,3	11,7	165,0
		% within Type of happiness Learn	32,7%	35,9%	14,3%	33,3%
	SMA	Count	100	65	0	165
		Expected Count	53,0	100,3	11,7	165,0
		% within Type of happiness Learn	62,9%	21,6%	0,0%	33,3%
Total		Count	159	301	35	495
		Expected Count	159,0	301,0	35,0	495,0
		% within Type of happiness Learn	100,0%	100,0%	100,0%	100,0%

Furthermore, the results of the Pearson Chi-Square calculation can be seen in table 8 of the Asmp value. Sig (0,000). With the acquisition of Asmp Value. Sig (0,000 <0,05), it can be concluded that Ha is accepted, which means there is a significant relationship between students' learning happiness and education level.

Table 4. Chi-square tests - the happiness of student learning

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	146,566[a]	4	,000
Likelihood Ratio	166,663	4	,000
Linear-by-Linear Association	138,996	1	,000
N of Valid Cases	495		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 11,67.

It is the same as the description of students' mathematical anxiety. The second phase of qualitative exploration of student learning happiness also uses the Colaizzi's strategy (Shosha, 2012). The following are some examples of statements of representation of research samples (learning happiness) in each level of happiness and level of education as follows.

Table 8. Interview result - the happiness of student learning

Type of happiness Learn	Description
Not Happy	"I once got a good math score, while I answered by guessing (multiple choice questions)" (SD-032) "The teacher gave an appreciation for my mathematical achievements, even though when I did the test, I copied the answers from my friends" (SMP-092) "I am the overall champion in school, even though I feel inadequate in the field of exact science, especially mathematics" (SMA-005)
Fairly Happy	"It's great to hear tomorrow's holiday ... and when you meet math subjects (you miss an effective day studying at school)". (SD-001) "It's happy if I can go forward answering math questions in front of the class ... and the results are correct" (SMP-123) "spaciousness of heart ,,,, if working on difficult math problems can be solved correctly" (SMA-034)
Very Happy	"Still remembering ... if I ever received a prize from a math teacher (silver queen chocolate) because my results were the best answer compared to classmates" (SD-046) "Feeling happy with the mathematical achievements. When studying before the test at home according to the questions given by the teacher at the time of the test ... so that the results of my mathematical answers also get a value of 100 "(SMP-115)

Based on the interview data in table 9, the research subjects (SD-032; SMP-092) described the condition of students' learning happiness with heart problems (false happiness). In addition, these conditions are counterproductive to academic ethics and are more inclined to academic fraud (Anderman & Danner, 2008). Another case that occurs in the subject of research (SMA-005) describes the happiness of learning through the ability to self-assessment (Tremblay, Inman, & Willms, 2000). Whereas in the research subject (SD-001) described negative learning happiness. That is, because it is based on students who are less precise in the sense of inner satisfaction. In addition, the condition is counterproductive to the need for science (mathematics) (Maddux & Rogers, 1983). Another case with the research subject (SMP-123; SMA-034) describes the ability to modify themselves through the creation of learning happiness with the ability to solve mathematical problems (Mayer, 1998). Whereas in research subjects (SD-046; SMP-115) describe learning happiness created by giving rewards (Nuttin & Greenwald, 2014; Carlson, Mann, & Alexander, 2000).

4. CONCLUSION

Based on research data, it can be concluded that level SMA students are more likely to experience math anxiety when compared to elementary and junior high school students. Whereas when viewed from the level of happiness of learning, elementary school students are happier learning when compared to junior and senior high school students. Discourse related to this is also reinforced by the results of hypothesis testing which shows that there is a significant relationship between mathematics anxiety and learning happiness with the level of education of students.

To overcome the obstacles found in this study, the authors put forward recommendations; Further studies can be improved with wider research sampling to the higher education level. In addition, the process of learning mathematics in schools requires special consideration in the application of innovative learning strategies that are appropriate to students' cognitive development in order to create student learning happiness.

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