



Analysis of Elementary School Students' Mathematical Anxiety Levels

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Abstract: The aim of this research is to measure students' anxiety levels regarding mathematics learning at the elementary school level in the city of Banda Aceh. This research uses a quantitative approach with a survey research type. This research was conducted on all elementary school students in the city of Banda Aceh with a sample of 90 students. The sampling technique used in this research was cluster random sampling. This research data uses a questionnaire. The data obtained is quantitative data which is then analyzed using descriptive analysis techniques. The results of this study show that the level of mathematics anxiety in elementary school students has an average score of 62.58%. The students' highest mathematics anxiety score was 92.18%, which means they fall into the very high anxiety level category. The lowest score achieved for students' mathematics anxiety was in the high category, because the score obtained was 53.12%. Based on the results of this research, we can conclude that the level of mathematics anxiety that occurs in elementary school students in the city of Banda Aceh is in the high level of mathematics anxiety category.

Keywords: mathematics anxiety, elementary school students, mathematics learning

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INTRODUCTION

Mathematics is an important element in human life. It can even be said that all human activities or things in our lives occur thanks to the contribution of mathematics in them. Call it counting activities, buying and selling transactions, technology, even simple activities such as looking at the clock in the morning when we wake up from sleep. It is important to study mathematics in the world of education because mathematics is often encountered in all areas of everyday life. According to James & James (Taleb et al., 2015), mathematics is the science of logic, of form, sequence, and concepts that relate one thing to another. This is also reinforced by the statement mentioned by Cockroft (Sadiq, 2007: 1) "It would be very difficult - perhaps impossible - to live a normal in very many parts of the world in the twentieth century without making use of mathematics of some kind ". This means that it would be very difficult or perhaps even impossible to live a normal life in many parts of the world in the twentieth century without using mathematics. Therefore, it

is appropriate for mathematics to become a need that must be fulfilled for every individual on this earth.

Given the importance of mathematics in human life, everyone must be able to acquire mathematical skills or knowledge to improve their standard of living and become a model for national growth. According to Saputra (2014:

75), "mathematics is a scientific discipline that is growing rapidly in increasing the progress of a country." The more professional a person is mathematically, the more he can advance his nation in various fields, both in the fields of economics, technology, agriculture, fisheries, and so on.

Given the importance of mathematics, Indonesia has made it a mandatory subject for all citizens to master. For many years now, mathematics has been required for all students, from elementary school to high school. Every exam at every level of education includes mathematics as a mandatory subject. In fact, students who wish to pursue higher education must pass college entrance examinations and professional examinations.

In addition, one of the goals of the Indonesian mathematics curriculum is the development of problem solving skills. Darminto (2013) stated that "the ability to solve problems is very important because in everyday life every human being is always faced with various problems that must be solved, including mathematical problems or problems whose solutions require mathematical calculations". Students who study mathematics are expected to have problem solving skills, such as understanding problems, creating mathematical strategies to solve them, completing mathematical models, and being accountable for the answers they produce.

An equally important benefit of learning mathematics is that it fosters problem-solving skills in humans. People who study mathematics can become more proficient in problem solving techniques, so they need to develop skills in understanding problems, creating mathematical models, solving problems, interpreting solutions (Oktaviyanti & Agus, 2018: 3). Here the teacher's task is to guide students' learning within a problem-solving framework so that they become proficient in problem-solving indications.

Based on TIMSS (Trend in Mathematics and Science Study) data in 2011, Indonesia was ranked 38th out of 42 countries with an average score of 386 in the problem-solving ability level category, reflecting the current reality. In 2015, Indonesia was ranked 69th out of 76 countries with an average score of 500. In the 2015 PISA survey published on December 6 2016, Indonesia also recorded poor performance by ranking 63rd out of 72 countries. Teachers should be able to determine learning that helps students improve problem solving abilities based on this data, even though students' problem solving abilities are still low.

Anxiety when studying is one element that can cause students' low problem-solving abilities. One popular description of anxiety is a condition where a person feels uncomfortable about something. Anxiety is defined as "an unpleasant condition including fear, tension, worry, confusion, dislike which is subjective in nature and arises because of a feeling of insecurity about the danger that will occur" by Nawangsari (Saputra, 2014: 77). For students, anxiety may arise from emotions of constant frustration with their academic tasks, Susanto (2016) states that "anxiety in learning greatly influences students' learning processes, both at school, in the family environment, and socially". Students will be encouraged to stay away from the source of their fear because of these feelings of anxiety.

According to Richardson & Suinn (1972), mathematics anxiety is a feeling of tension and anxiety that affects simultaneously when a student solves mathematical problems in everyday and academic life. This is in line with Sieber's opinion (in Sudrajat, 2008: 1) which states that anxiety is considered an inhibiting factor in learning which can interfere with the performance of a person's cognitive functions, such as concentrating, remembering, forming concepts and solving problems.

Anxiety can cause students' cognitive function performance to be disrupted, such as concentration and memory, problem solving, and concept formation (Ikhsan & Sukabumi, 2019). The negative influence of anxiety arises because many students consider

mathematics to be abstract and complicated, especially solving mathematical problems (Wijaya et al., 2018). Student achievement will be affected if students have excessive mathematics anxiety (Anita, 2014).

Students' dislike of mathematics lessons can cause high levels of mathematics anxiety and can reduce students' understanding of mathematics problems (Nurghufon, 2013). The causes of mathematics anxiety in students are due to their views on mathematics itself, experiences when learning mathematics in the classroom, teaching methods, and family (Kidd, 2003). Mathematics anxiety can occur because of students' negative thoughts about mathematics problems (Irfan, 2017).

Anxiety can occur because students face a situation or complete a task. Anxiety is a psychological disorder that can occur anytime and anywhere and can happen to everyone (Imro'ah, et.al.,

2019). Mathematics anxiety should not be underestimated because it can cause significant disruption to student learning achievement in mathematics. This means that mathematics anxiety can have an impact on students' low mathematics learning achievement at school.

Student achievement will be affected if students have excessive mathematics anxiety (Anita, 2014). Mathematics anxiety influences students' ability to solve mathematics problems (Adhimah & Ekawati, 2020). If students experience mathematics anxiety, their mathematics abilities will weaken and students will avoid things related to mathematics because of their inability to adapt so that students' mathematics learning outcomes and achievements will be low (Imroah, Winarso & Baskoro, 2019). Anxiety in learning results in learning difficulties (Irfan, 2017).

Mathematics anxiety can be seen when students complain, are uneasy and uncomfortable when learning mathematics in class and this condition can affect the results students get (Purnomo, 2016). Anxiety has an impact on disrupting student performance and reducing student memory performance and being unable to complete the tests they face using the information they have obtained (Ashcraft, 2002). Based on the results of previous research conducted by Richardson and Suin, one of the aims was to determine students' anxiety regarding learning mathematics in real life and academically. Not only are students involved in mathematics lessons at school academically, but whatever forms of problems in daily life come into contact with numbers, students will be anxious and tense.

This research uses context that comes from students' real lives, not from textbooks or teachers. This research also emphasizes students' thinking and discussion processes, not the final result or correct answer. This research also gives students the opportunity to discover and explore mathematical ideas on their own, not just follow the instructions or rules given by the teacher.

METHODS

This research aims to measure students' anxiety levels regarding mathematics learning at the elementary school (SD) level in the city of Banda Aceh. This research uses a quantitative approach with a survey research type. The survey used to measure the anxiety level of elementary school students in the city of Banda Aceh regarding mathematics learning can be compiled using a questionnaire consisting of structured questions shown to students. These questions can provide an idea of the level of anxiety felt by students regarding learning mathematics in elementary school.

This research was conducted in the city of Banda Aceh, Aceh province, Indonesia. The population of this study were elementary school (SD) students in the city of Banda Aceh. The sample for this research was students in grades I-VI of elementary schools, totaling 90 students. The research sample was determined using a cluster random sampling technique.

This research data is quantitative research. This research data was obtained using a questionnaire technique. The questionnaire in this study used a Likert scale (1-4). This research instrument refers to the student's mathematical anxiety instrument. The questionnaire that has been prepared is then given to students directly (offline). Below is presented the research instrument or questionnaire used in this research.

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1. When I solve math problems, I feel:
2. When I think about doing math, I feel:
3. When I work on difficult math problems that make me think hard, I feel:
4. Compared to other subjects, this makes me feel:
5. When I solve a math puzzle I feel:
6. When I have a difficult math problem I feel:
7. When the teacher calls me to answer a math problem, I feel:
8. When the teacher shows me solving math problems, I feel:
9. If I had to add up the numbers on the blackboard in front of the class, I would feel:
10. When I make a mistake in mathematics, I feel:
11. Thinking about doing math in class makes me feel:
12. Doing math at home makes me feel:
13. When the teacher gives me a math problem that I don't understand, I feel:
14. When my teacher said he would give me a math problem on the board, I felt:
15. When I found out that my class would be doing math at school, I felt:
16. When I found out that I had a math test, I felt:

The data obtained in this research is quantitative data which is then analyzed using descriptive statistics. Descriptive statistical methods were used to find out how much mathematics anxiety elementary school students have regarding mathematics learning. Data score calculations are used to determine students' mathematics anxiety scores. The scores obtained are then used to determine students' mathematics anxiety levels in the very high, high, low, and very low categories. The steps taken to calculate the data score are:

- a. Calculate each student's final score.
To determine the final score for students' mathematics anxiety levels, the following calculations are carried out:
Grade = (Total student scores) / (Total maximum scores) X 100%
- b. Create a frequency distribution table
- c. Score category

The following trend score formula refers to the Wagiran formula (Wagiran, 2014).

Table 1. *Category interval information score*

| Interval skor | Category |
|----------------------|-----------------|
| 65% - 80% | Very High |
| 49% - 64% | High |
| 33% - 48% | Low |
| 16% - 32% | Very Low |

RESULTS

The mathematics anxiety scores of elementary school students in the city of Banda Aceh who participated in the research are presented in table 2.

Table 2. *Category interval information score*

| Student (N) | Highest score | Lowest score | (mean) | Modus | Standard deviation |
|--------------------|----------------------|---------------------|---------------|--------------|---------------------------|
| 90 | 92,18 % | 53,12% | 62,58% | 65,62% | 15,52% |

From table 2 it appears that the average student mathematics anxiety score is 62.58%. If we refer to the classification of students' mathematics anxiety levels in table 1, it shows that the mathematics anxiety levels of students at elementary school level in Banda Aceh City are generally at a high level of anxiety. This category is also the condition of most elementary school students in Banda Aceh City, which is indicated by the mode value of 65.62% which is also included in the very high level of anxiety.

The highest score for students' mathematics anxiety was 92.18%, which means they fall into the very high anxiety level category. However, the lowest score for students' mathematics anxiety was in the high level category, because the score obtained was 53.12%.

DISCUSSION

Based on the results in table 3, it shows that the level of mathematics anxiety of elementary school students in Banda Aceh City is included in the very high level category, in fact this very high level category is also a mode among elementary school students in Banda Aceh City. Likewise, the results shown in table 3 show that only 18.89% of students experienced low levels of anxiety, and students who were categorized as low or even very low anxiety were 2.22% of students.

This data is good capital for mathematics educators in Banda Aceh City to map students' conditions in improving students' mathematics, related to students' attitudinal and cognitive abilities, both in the dimensions of the mathematics learning process and students' mathematics learning outcomes.

This is in accordance with recommendations from Stuart (2000) that the classroom, among other things, should be a mathematical community that develops for problem solving which builds mathematical self-confidence in students. Likewise, recommendations from the research results of Ramirez et al. (2013), namely for mathematics teachers to investigate the development of students' mathematics anxiety as an important first step in developing interventions that are designed, among other things, to improve students' mathematics learning achievement.

The results in table 3 provide guidance to mathematics educators in Banda Aceh City to pay attention to things that constitute students' mathematics anxiety items. Based on the existing sequence, educators can determine the priority focus for handling mathematics anxiety items. Continuously and gradually, educators think about strategies to overcome students' mathematics anxiety starting from the mathematics anxiety item with the highest average and so on to the anxiety item with the lowest average. This is in accordance with the opinion of Stuart (2000) who states that educators must be able to recognize that students' mathematics anxiety is real and must think about strategies to reduce students' levels of mathematics anxiety.

From table 3 it is also known that the anxiety results with the highest average currently are 51.11%. This shows that students' math anxiety problems stem from students' individual beliefs or self-confidence about mathematics. This is reinforced by the results related to the dimensions of students' mathematics anxiety, namely that students have higher mathematics evaluation anxiety compared to mathematics learning anxiety. This is in accordance with the theory presented by Dodd (1922) which explains that when

someone has low or no self-confidence in their own beliefs, obstacles to learning occur because of the idea that "beliefs govern action".

Therefore, the most important thing for mathematics educators is to determine learning strategies using various methods that can increase students' self-confidence to be successful in mathematics. This is in line with the opinion of Stuart (2000), that mathematics is 90% mental, or how students understand their own level of competence when doing mathematics. Therefore teachers need to find methods to increase students' self-confidence to ensure they can experience success.

And more than that, with the creativity of professional mathematics educators, they are able to change students' mathematics anxiety into mathematics confidence. With good confidence and self-confidence, students will participate in mathematics learning well, so they will be better prepared to take mathematics tests without anxiety. And in the end students are able to obtain optimal mathematics learning outcomes. This is in accordance with the opinion of Ma (1999) who states that when educators are able to change mathematics anxiety into mathematics confidence, students not only receive an emotional boost to their self-esteem, but teachers are able to find ways to bridge the gap between academic achievement and mathematics anxiety.

CONCLUSION

This research conducted a survey to measure students' anxiety levels regarding mathematics learning at the elementary school level in the city of Banda Aceh. The research method used is a survey with a quantitative approach and using a questionnaire with a Likert scale. The results of data analysis show that the mathematics anxiety scores of elementary school students in the city of Banda Aceh are in a varying range, from very low to very high. The math anxiety level of elementary school students in Banda Aceh City is generally at a high anxiety level, with an average math anxiety score of 62.58%. The percentage of mathematics anxiety levels of elementary school students in Banda Aceh City based on anxiety level categories, namely: very high 51.11%, high 27.78%, low 18.89% and very low 2.22%. Based on the highest average of students' mathematics anxiety, in general the problem of mathematics anxiety among elementary school students in Banda Aceh City originates from students' individual beliefs or self-confidence about mathematics. The implication of these findings is the need for special attention to student anxiety in learning mathematics at the elementary school level. With a better understanding of students' anxiety levels, more supportive learning approaches and appropriate teaching strategies can be developed to help reduce student anxiety and improve mathematics achievement. Thus, this research makes an important contribution to understanding student anxiety in learning mathematics at the elementary school level, as well as providing a basis for developing more effective learning strategies in overcoming student anxiety related to mathematics subjects.

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