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The Relationship Between Anxiety and Numerical Literacy of Elementary School Students

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ABSTRACT

This study aims to: 1) Describe the level of mathematics anxiety of fifth grade students of SDN 6 Singkawang, 2) Describe the level of numeracy literacy of fifth grade students of SDN 6 Singkawang, 3) Describe the relationship between mathematics anxiety and numeracy literacy of fifth grade students of SDN 6 Singkawang. This type of research is quantitative research. The research design uses a correlation design. The population in this study were all fifth grade students of SDN 6 Singkawang. The sample used saturated sampling totaling 21 students. Data collection techniques used a mathematics anxiety questionnaire and a numeracy literacy test. Data analysis techniques used descriptive percentage tests and Pearson product moment correlation tests using Excel and SPSS 27. The results of the study showed: 1) students' mathematics anxiety was in the very low category with a percentage of 48%, 2) students' numeracy literacy was in the very low category with an average value of 49, 3) there was no significant relationship between students' mathematics anxiety and numeracy literacy. The correlation value is 0.118 and the correlation coefficient is in the very low category.

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1. INTRODUCTION

Mathematics Anxiety and Students' Numeracy Literacy have a close relationship both theoretically and practically. Theoretically, mathematics anxiety can interfere with students' thinking processes, which reduces their ability to understand and apply numeracy concepts. Practically, students who experience mathematics anxiety tend to avoid tasks related to mathematics, which ultimately hinders the development of their numeracy literacy. Therefore, it is important to understand and overcome mathematics anxiety in order to improve students' numeracy literacy.

One of the basic sciences learned from elementary school, junior high school and high school to higher education is mathematics education. Learning mathematics at elementary school level is the starting point for a child to develop his/her ability to understand mathematical concepts. (Mathematics

is related and supports various fields of science and various aspects of life (Sari, 2019). The definition of mathematics according to Yolanda (2019: 353) is the study of numbers, and the study of logic that are interconnected, and are divided into three large groups, namely algebra, analysis, and geometry. With mathematics, students can think systematically, critically, creatively and logically. Therefore, it can be seen that understanding mathematical concepts is very important. In the world of basic education, mastery of mathematical competencies is important. Mathematics is always used in everyday life, mathematics is there from waking up, seeing the time, measuring speed, predicting distance and so on until going back to sleep. Mathematics is everywhere, "it is experienced and practiced by every culture ..." (Brandt & Chernoff, 2015). However, mathematics is still considered a difficult subject to understand because the mathematics taught is not relevant to the student's context. Mathematics is one of the courses that plays a role in developing students' ability to reason and solve everyday problems (Kusmaryono & Ulia, 2020). Problems that often occur in students are feelings of boredom in learning, students think that mathematics is a difficult subject, are afraid to try, are embarrassed to ask, and have difficulty in working on problems. So that mathematics becomes one of the learning materials that is less interesting for some students (Muhari et al, 2024).

Anxiety is something that is naturally experienced by every individual when studying (Nofrialdi, Maison & Muslim., 2018). Anxiety is a subjective experience associated with mental tension that indicates anxiety and inability to handle problems well (Diana, Marethi & Pamungkas., 2020). Anxiety felt when studying mathematics is called mathematics anxiety (Meriyati et al., 2018). There are students who think that mathematics is a scary subject. As a result of this thinking, most students are afraid to deal with mathematics and other related subjects. Mathematics is one of the subjects that students do not like. Mathematics anxiety should not be underestimated because it can cause disruption to student learning achievement (Winarso & Supriady, 2016). Mathematics anxiety in the affective domain can support achievement in the cognitive domain, such as students' ability to reason mathematically (Umaroh et al., 2020). The abstract nature of mathematics, full of numbers and formulas makes mathematics often seen as a difficult and scary subject (Ekawati, 2015). Mathematics anxiety is seen as a student's response to situations in mathematics learning when they feel pressured which can then trigger feelings of discomfort that are shown both physically and psychologically (Winarso & Haqq, 2019).

Weilin, et al (2017) stated that numeracy literacy is the knowledge and ability to use various numbers and symbols related to basic mathematical concepts to solve relevant practical problems that are contextual, as well as to examine information provided in various formats including graphs, tables, charts, and the like and then use the interpretation of the results of the analysis in decision making. Students' numeracy literacy skills are very much needed considering that mathematics is not only related to formulas but trains students' critical thinking and reasoning skills in solving the problems presented (Salvia et al., 2022). Based on the theory above, it can be concluded that numeracy literacy is the knowledge and ability to use various numbers and symbols related to basic mathematical concepts to solve relevant practical problems that are contextual, as well as to examine information provided in various formats including graphs, tables, charts, and the like and then use the interpretation of the results of the analysis in decision making. This is supported by what was done by (Auliya 2016) entitled "The Effect of Mathematics Anxiety on Students' Mathematical Understanding". The results of the study indicate that the presence of mathematical anxiety in class VIII of South Jakarta State Junior High School has a significant effect on students' mathematical understanding abilities. This study supports the research to be conducted because it uses the same variables. However, differences in data sources allow for differences in research results. Then the study conducted by (Nursyifa 2023) entitled "Analysis of the Relationship between Numeracy Literacy and Student Learning Outcomes." The results of this study indicate that numeracy literacy has a mutually influential relationship with student learning outcomes, because with students' understanding and ability to use skills in managing numbers and symbols well, their learning outcomes in mathematics subjects can improve more than before. In addition, numeracy literacy skills can also improve the ability to solve problems related to numbers, tables and symbols in everyday life. This study supports the research to be conducted because it uses

the same variables. However, differences in data sources allow for differences in research results. Based on this previous study, the relationship between mathematical anxiety and numeracy literacy of fifth grade students has never been studied before.

Based on the pre-research that has been done, the researcher conducted a written test of numeracy literacy in grade V stating that out of 21 students, 17 students still do not understand what numeracy literacy is, while only 4 students already understand numeracy literacy. Therefore, there are students who are anxious during learning, feel tense, lethargic, cannot rest peacefully, are easily shocked, cry easily, tremble and are restless. In addition, numeracy literacy in the classroom is still lacking in interest and enthusiasm in this matter because many students do not understand the use of various numbers and symbols related to basic mathematical concepts. From the above explanation, this study aims to describe the level of mathematical anxiety of grade V students of SDN 6 Singkawang, explain the level of numeracy literacy of grade V students of SDN 6 Singkawang, and describe the relationship between mathematical anxiety and mathematical literacy of grade V students of SDN 6 Singkawang. Based on the description above, the author is interested in conducting a study entitled "The Relationship between Mathematical Anxiety and Numeracy Literacy of Fifth Grade Elementary School Students".

2. METHOD

The method in this study uses a quantitative method. According to Sugiyono (2019), the quantitative method is a research method based on the philosophy of positivism. This method is used to conduct research on a specific population or sample, where data is collected using research instruments. Data analysis is quantitative or statistical, with the main objective of testing the previously formulated hypothesis. Meanwhile, the research design applied in this study is correlation. According to Arikunto (2010), the correlation research design aims to measure the level of relationship between two variables without changing the data that has been collected. The study was conducted at SDN 06 Singkawang, located on Jl. Hansip Gg.Pendidikan. Village / District,: Sekip Lama, Kec.Singkawang Tengah.Singkawang City, West Kalimantan. The study was conducted in the odd semester of the 2024/2025 academic year at SDN 06 Singkawang.

The population of this study was all fifth grade students of SDN 06 Singkawang, totaling 43 students, consisting of 22 class A students and 21 class B students with the research sample using purposive sampling technique for sampling. According to Sugiyono (2019), purposive sampling is a sampling technique based on certain considerations. This means that the sample is selected based on certain criteria or considerations that have been previously determined by the researcher. Therefore, the sample in this study included all fifth grade students of SDN 06 Singkawang, with a total of 43 students consisting of 22 class A students and 21 class B students.

The data collection technique was carried out using a questionnaire in the form of questions given to fifth-grade students of SDN 06 Singkawang once to analyze the relationship between mathematics anxiety and numeracy literacy and a test in the form of tasks carried out was used to measure students' abilities. The data collection instrument used a mathematics anxiety questionnaire sheet using Yes and No answers, which were then given an assessment weight. The scale consists of 16 statements, including 4 somatic statements, 4 cognitive statements, 4 affective statements, and 4 statements of mathematical knowledge. The questionnaire sheet contains positive and negative statements regarding the mathematics anxiety of fifth-grade students of SDN 06 Singkawang, then a written numeracy test consisting of 10 questions. The results of the validity test showed that 9 out of 10 questions were valid, with a reliability of 0.638, so this instrument can be used in research. The data analysis technique used descriptive statistical data analysis, which included percentages, values, and correlations. The first analysis of mathematics anxiety data collected through questionnaires, analysis of the relationship between mathematics anxiety and numeracy literacy using normality tests, using the Shapiro-Wilk test with the help of SPSS version 27 and hypothesis test analysis to evaluate the level of relationship between independent variables and dependent variables.

3. FINDINGS AND DISCUSSION

Results

Mathematics Anxiety of Grade V Students of SDN 6 Singkawang

Students' math anxiety was collected using a questionnaire consisting of 13 statements, with 21 student respondents. The results of the analysis showed that students' math anxiety reached a total score of 132, with an average of 6.29 and a percentage of 48%, which is included in the very low category.

The results of data analysis in table. 1 show that the somatic indicator has a value of 40 and an average of 1.29. Then with a percentage of 43% and is in a very low category. The cognitive indicator has a value of 27 and an average of 1.29. Then with a percentage of 43% and is in a very low category. The affective indicator has a value of 38 and an average of 1.81. Then with a percentage of 45% and is in a very low category. The mathematical indicator has a value of 27 and an average of 1.29. Then with a percentage of 64% and is in the medium category.

Table. 1
Student Mathematics Anxiety Data Based on Indicators

Indicator	Number	Middle	Percentage (%)	Group
Somatic	40	1.90	48	Very low
Cognitive	27	1.29	43	Very low
Affective	38	1.81	45	Very low
Mathematics	27	1.29	64	Moderate

The results of the data analysis in table 2 show that there is 1 student with a percentage of 4.8% in the high category, there are 2 students with a percentage of 9.5% in the medium category, there are 4 students with a percentage of 19% in the low category, and there are 14 students with a percentage of 66.7% in the very low category.

Table 2
Student Mathematics Anxiety Data by Category

No	Category	All over	Percentage
1	Very high	0	0
2	Tall	1	4.8
3	Currently	2	9.5
4	Low	4	19
5	Very Low	14	66.7
All over		**21**	**100%**

Based on the research data contained in tables 1 and 2, it can be concluded that students' mathematical anxiety at SDN 6 Singkawang is in the very low category. This shows that students do not have high anxiety during mathematics learning so that they can easily follow mathematics learning well.

Numeracy Literacy Data of Grade V Students of SDN 6 Singkawang

The results of data analysis in table 3 show that the number indicator has an average score of 24, an average score of 38, and is in the very poor category. The measurement and geometry indicator has an average score of 26, an average score of 62, and is included in the deficiencies category. The data and uncertainty indicator has a value of 19, an average score of 45, and is in the very poor category. The algebra indicator has an average score of 25, an average score of 60, and is in the deficiencies category.

Table 3
Student Numeracy Literacy Test Results Based on Indicators

Indicator	Number	Average Score	Group
Amount	24	38	Very poor
Measurement and Geometry	26	62	Not enough
Data and uncertainty	19	45	Very poor
Algebra	25	60	Lack

The results of the data analysis in table 4 show that there are 15 students with a percentage of 71.5% in the very poor category, there are 2 students with a percentage of 9.5% in the very good category, there are 2 students with a percentage of 9.5% in the good category, and there are 2 students with a percentage of 9.5% in the very good category.

Table 4
Students' Mathematics Numeracy Literacy Test Results by Category

No	Group	All over	Percentage
1	Very good	2	9.5
2	Good	2	9.5
3	Fair	2	9.5
4	Poor	0	0
5	Very poor	15	71.5
All over		21	100%

Based on the research data contained in tables 4.1 and 4.2, it can be concluded that the average numeracy literacy of students at SDN 6 Singkawang is in the very poor category. This shows that students' numeracy literacy is still in a worrying condition because low numeracy literacy can affect other abilities.

Discussion

a. Students' Mathematics Anxiety

The results of the study showed that the average mathematics anxiety of students was very low, with a percentage of 48%. Based on the indicators that form mathematics anxiety, the average is in the very low category, with a percentage of 48% for somatic, 43% for cognitive, 45% for affective, and 64% for mathematics. This shows that students do not experience problems with mathematics anxiety, meaning that they can control their anxiety about mathematics lessons so that they can follow the lessons well. Very low mathematics anxiety allows students to be more confident, enjoy mathematics lessons, feel that mathematics is not a difficult subject, and improve their ability to solve the problems given. Thus, students do not feel tense, worried, or afraid during mathematics lessons. These results indicate that students are able to control excessive anxiety in themselves. This finding is in line with Blazer's opinion (2011) which states that mathematics anxiety can be controlled in several ways, such as getting used to practicing mathematics problems every day with independent learning techniques, understanding mathematical concepts rather than just memorizing them, being confident, asking and asking for help when they do not understand the concept, and practicing self-calming techniques when feeling nervous and afraid.

b. Numeracy Literacy

The results of the study showed that the average students' numeracy literacy skills were in the very poor category, with an average score of 49. Based on the indicators that form mathematical anxiety, it can be seen that the average indicators are in the poor and very poor categories. The average score

for each indicator is 38 for numbers, 62 for measurement and geometry, 45 for data uncertainty, and 60 for algebra. This indicates a problem with students' numeracy literacy, which means that students do not have good literacy and numeracy skills, so that it can affect other abilities. Basically, one of the factors that causes students' low numeracy literacy skills is the preconceived notion that numeracy-based subjects are difficult, so they give up before trying. This has an impact on enthusiasm and enthusiasm in participating in learning in class (Salvia et al., 2022).

c. The relationship between math anxiety and numeracy literacy

The results of the study showed that the research data was normal, and the Pearson product moment correlation analysis showed that there was no significant relationship between mathematics anxiety and numeracy literacy, with a correlation value of 0.118 which is included in the very low category. This shows that an increase in mathematics anxiety is not followed by an increase or decrease in students' numeracy literacy, and vice versa. This disconnection can be caused by various other factors that contribute to students' low numeracy literacy. According to previous studies, several factors that influence numeracy literacy include learning motivation (Hasibuan, 2022), interest and critical thinking (Septia, 2023), parenting patterns (2022), and other factors that still require further research. Mathematics anxiety is not a determining factor in students' low numeracy literacy at the research location, as stated in previous research by Bainuddin Yani et al (2015), which stated that there is no relationship between mathematics anxiety and students' mathematics learning achievement.

4. CONCLUSION

The mathematics anxiety of 5th grade students of SDN 06 Singkawang is in the very low category, with an average percentage of 48%. The somatic anxiety indicator shows a percentage of 48%, cognitive 43%, affective 45%, and mathematics-related anxiety 64%. On the other hand, students' numeracy literacy skills are in the very low category, with an average score of 49. The number skill indicator scores 38, measurement and geometry 62, uncertainty data 45, and algebra 60. Furthermore, the results of the analysis show that there is no significant relationship between mathematics anxiety and numeracy literacy, with a correlation value of 0.118, which is included in the very low category. This indicates that the mathematics anxiety factor does not directly affect students' numeracy literacy in the context of this study. Therefore, a more comprehensive educational approach may be needed to improve the relationship between mathematics anxiety and numeracy literacy.

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