ANALYSIS OF LEARNING OBSTACLE TO NUMERACY ABILITY BASED ON MATHEMATICAL RESILIENCE OF ELEMENTARY STUDENTS

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ABSTRACT

The difficulty felt by students in the learning process when students face a question and students feel difficulties in using their knowledge, we can say it to be a learning obstacle. Meanwhile, in learning, mathematical resilience can be said to be a positive attitude of students in the learning process. The relationship of mathematical resilience to mathematics learning will make students more interested and motivated in learning mathematics. This type of research is descriptive qualitative. This study studies and explores the characteristics of learning obstacles to numeracy ability based on students' mathematical resilience in geometry materials. The data collection techniques used are numeracy ability tests with geometry materials, student mathematical resilience questionnaires, and interviews. The subjects in this study were 24 students of class V B of SDN Mekarjaya 01. In this study, the data were analyzed by identifying the answers of 24 respondents to the numeracy ability test and mathematical resilience questionnaire that students had conducted. The result is that we can see some of the characteristics of learning barriers found in grade V students of SDN Mekarjaya 01, the characteristics of these learning barriers include difficulties and weaknesses in calculating, difficulties in transferring knowledge, and difficulties in understanding mathematical language. Looking at the characteristics of learning barriers, it is concluded that students have resilience in mathematics can affect students' attitudes in facing problems in learning mathematics.

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INTRODUCTION

Based on assessment and learning ministry of education and culture, (2020) numeracy is the ability to think by using a concept, procedure, fact, and mathematical tool used to solve problems that occur in everyday life in various types of contexts. Numeracy itself has three aspects which include numeracy relations, numeracy and arithmetic operations (Ayuningtyas & Sukriyah, 2020). These three aspects are basic aspects of learning that are important to be

introduced from an early age. At the beginning of elementary school age, numeracy skills will develop and lead to numeracy knowledge with abstract concepts. With students having numeracy skills, the student will have a sensitivity to numeracy which is closely related to daily life (Ayuningtyas & Sukriyah, 2020). We relate the importance of numeracy skills in students in mathematics learning to problem solving in mathematics. Without the ability to solve problems in mathematics, the use of learning mathematics becomes very limited. This can cause learning obstacles, where learning obstacles are difficulties felt by students in learning, where students cannot use their knowledge of the questions faced. Learning obstacles are various kinds of views based on the situation and conditions that occur, such as based on the condition of students, teachers or the environment in which we carry out learning (Nurani et al., 2021).

Geometry is one mathematics materials in elementary school. Opinion from Schwartz (Haqq et al., 2019) geometry is a concept that connects various fields in mathematics, by studying geometry students can connect mathematical concepts from abstract to more concrete ones so that they can easily see the relationship between the two so that understanding arises. In learning geometry, there are skills that students must have, including visualizing, knowing various kinds of flat buildings and building spaces, describing images, and the ability to recognize differences and similarities between geometric buildings, therefore students need a mature concept in order to apply these geometry skills (Fauzi & Arisetyawan, 2020; Maarif et al., 2018). Geometry has benefits in everyday life, used in problem solving for various fields such as architects, scientists who are people who use concepts from geometry for their work (Novianda, 2022). Another benefit of studying geometry is to have knowledge that can provide insight to understand the shapes around, by studying geometry will have knowledge and insight in understanding scientific thinking (Wardhani, 2020).

At the elementary school level, they taught geometry to know how to identify the properties of flat buildings and determine the circumference and area of flat buildings. However, there are many difficulties that students feel in this geometry material, those difficulties include students finding it difficult to form constructions in a real way, and in this material it takes a long time to prove answers. Students who are incapable of understanding abstract concepts in geometry material indirectly show that students cannot decipher and interpret evidence (Maarif, 2017). The difficulties in the geometry of material experienced by the student we can see the proof from his research Yunia Mulyani (S. D. Fitria & Maarif, 2021) explains that the difficulty of students in completing geometry lies in the difficulty of understanding concepts and the difficulty of counting. If students have difficulty in understanding concepts, there can be obstacles when solving geometry problems.

Another important thing that students need is not only limited to the ability to understand concepts, but students also need to have a mathematical resilience that contains positive attitudes in learning such as self-confidence, perseverance, optimism and perseverance in the process (Asih et al., 2019; Maarif et al., 2021). When students face difficulties, students felt anxiety and avoid related things in problem solving. The relationship of resilience to mathematics learning students will be more interested and motivated in the learning process and students can believe that it is valuable. When students' motivation is great in learning it, the greater they will survive when faced with difficulties (Zanthy, 2018). Evidence of resilience in learning can be see in research conducted by Iman & Firmansyah, (2020) which explains that students' mathematical resilience has a contribution in influencing students' mathematics learning, where if the student's resilience ability is high, it will create good student learning outcomes.

The studies that discuss learning obstacles in mathematics learning include by Wahyuningtias (2020) Learning obstacles of grade IV elementary school students on the concept of fractional summation. Anggraini et al., (2020) Analysis of student learning difficulties in elementary school mathematics subjects. Nurani et al., (2021) Analysis of students' learning obstacles on fractional material worth in grade IV elementary school. Lestari & Suryadi (2019) Learning obstacle analysis on the learning of the place value of grade II elementary school students.

From previous studies related to learning constraints in mathematics learning, researchers are interested in studying "Learning Obstacle Analysis of Numeracy Ability Based on Mathematical Resilience Aspects of Class V Elementary School Students in Geometry Material". This study examines and explores the characteristics of learning obstacles to numeracy ability based on aspects of mathematical resilience of grade v elementary school students in geometry material.

METHOD

This research is a type of qualitative descriptive research because in this study will describe the situation that occurs at the present time systematically and factually to explain and solving the problem under study. The reason for using this type of research is to describe student learning barriers based on the aspects of mathematical resilience of students. using this method as a solution to a study to solve the problem under study, namely analyzing the obstacles to mathematics learning based on mathematical resilience whose results can be clear and accurate. The research was conducted with 24 students with 12 female students and 12 male students.

The data collection techniques used are tests, questionnaires, interviews, and documentation. I used test instruments to measure students' numeracy ability. Questionnaires are used to get information from respondents about what they experienced and knew, while interviews are used to know things from respondents directly for more detail and depth. The data analysis technique used is to follow Miles and Huberman's model, which includes data reduction, data presentation, and drawing conclusions. Data analysis carried out by analyzing the results of the student numeracy ability test, students given 11 questions with a score of 2 each on each question. 3 representative subjects were determined to interview in order to get more in-depth information. In taking mathematical resilience data, students fill out a mathematical resilience questionnaire. From each statement there are 4 answer choices, namely (SS) strongly agrees, (S) agrees, (TS) disagrees, (STS) strongly disagrees. We can see the indicators in the numeracy ability and mathematical resilience of students in table 1 below:

Table 1. Mathematical Numeracy and Resilience Indicators.

Indicators Numeracy Ability	Indicators Mathematical Resilience
1. Connecting real objects, drawings, and diagrams into mathematical ideas	a. Have the belief that mathematics is something valuable and worthy of learning and engaged
2. Explain mathematical ideas, situations, and relationships, orally or in writing with real objects or images	b. Have persistence in learning mathematics even though you experience difficulties or obstacles

3. Stating everyday events in mathematical language or symbols	c. Have confidence in yourself that you can learn and master mathematics well, be it based on understanding with mathematics, experience, or the help of others
4. Can analyze information displayed in various forms, such as images, graphs, tables or others	
5. Ability to use its structures to present ideas describing relationships and models	d. Have an optimistic attitude, and think positively in any situation when learning mathematics

RESULTS AND DISCUSSION

Based on the data got from the test given by the researcher to the students, the researcher can find out the numeracy ability of class V students. There are 11 questions that students do that contain indicators of numeracy skills in geometry materials. From the calculation results in table 2, researchers can determine the research subjects with the criteria of low-ability students, medium-ability students, and high-ability students.

Table 2. Student Mathematical Resilience Questionnaire

Category	Interval	Frequency	Percentage
High	$x \geq 48$	6	25%
Medium	$42 < x \leq 45$	11	46%
Low	$x < 42$	7	29%
Total		24	100%

Based on table 2, we can see that the percentage of mathematical resilience of students with high categories is 25%, medium categories are 46%, and low categories are 29%.

The following is a description that explains the learning barriers of students in numeracy ability in geometry material based on aspects of student mathematical resilience with the results of interviews with 1 subject in each category of mathematical resilience, namely BK, VA, and AJ.

a. Low Resilience Student Numeracy Ability

In the category of students with low resilience, researchers determined one student subject selected to be represented as a student of the low resilience category, namely BK, KS and RR. Then the researcher determines the most incorrectly answered questions by all categories, namely questions number 5, 6 and 7. Question number 5 we can see in figure 1 below.

Picture 1. Question number 5

5. Diketahui ada sebuah kardus dengan bentuk bangun ruang kubus mempunyai panjang sisi sebesar 30 cm. Hitunglah volume, keliling dan luas permukaan kardus tersebut!

Jawaban :

In question number 5, the subject should write the answer to the count of cube volume, circumference and surface area. But BK answer is incorrect and incomplete because BK only wrote one solution answer regarding the volume of the cube, and even then it is still wrong to calculate the results. BK's answer we can see in figure 2 below.

Picture 2. The result of the answer to BK question number 5

Then the next answer by KS low resilience students. KS answers the same as incomplete BK only answers the completion of the cube volume, the difference is that the calculation result of the cube volume obtained by KS is correct. We can see the answer to KS in figure 3 below.

Picture 3. The result of the answer to KS question number 5

Furthermore, the answers of students with low resilience RR. RR replied that it was quite complete, he completed the answer to the volume of the cube as well as the circumference of the cube, only the surface area alone could not be solved. However, the results of the RR calculation still have errors, namely in the calculation of the results in finding the volume of the cube. He was not quite right in determining the result. We can see the answer to RR in figure 4 below.

Picture 4. The result of the answer to RR question number 5

The researcher interviewed BK, KS, and RR about the obstacles he experienced when solving question number 5 and his level of mathematical endurance when working on the problem. From the results of the interviews of BK, KS, and SS, the average of them explained that the difficulty lies in carrying out the calculation process with a large number and forgetting also with the formula so that in question number 5 they can be said to have problems in counting and they say they are reluctant to ask and choose to answer soberly, this is related to the resilience that exists in them. In addition to the interview with the subject, the researcher again corroborated with an interview with the teacher of class V B regarding question number 5 the teacher said that the question was still easy but for children whose numeracy ability was

still low, they could not get good count results because in class V B the teacher emphasized that there are still some children whose numeracy ability is still low, they need the help of the media to count. It can be concluded that BK, KS, and RR fall into the category of low resilience because he gives up not wanting to take action in order to complete the answer to the question, in the end the answers to the questions filled by BK, KS, and RR are still incorrect and incomplete. This is in line with the research by Rahmatiya & Milatun (2020) which explains that the student who experiences a dislike of mathematics lessons because the student experiences some obstacles so that the student in the end feels saturated and eventually gives up.

b.   Numeracy Ability of Moderate Resilience Students

In the category of students with moderate resilience, researchers selected one student to represent as a student of the moderate resilience category. The VA subject encountered an obstacle to resolving question number 6. Question number 6 we can see in figure 5 below.

Picture 5. Question number 6

In question number 6, the subject should answer completely the completion of the difference between Bayu and Rani's pencil boxes by finding each determining the volume of the pencil case from Bayu and Rani. But the VA answer only completed the search for Bayu pencil case volume and the calculation results were also not correct and also the volume of the pencil case Rani's cannot be answer so that the difference between the two pencil cases cannot solved, so the answer from VA on question number 6 was still incomplete and precise.

Picture 6. The result of the answer to VA question number 6

Researchers dig deeper by going through interviews with VA to find out what obstacles he experienced when facing question number 6 and to find out his level of resilience when doing the questions. Va explained he faced difficulties in understanding question number 6 but he still gave an answer, even though it was incomplete and precise. Besides interviewing with the subject, the researcher strengthened again by interviewing with the teacher of class V B about question 6. The teacher said that question number 6 is still relatively easy if he understands what the question means and also memorizes the formula. From the test results, interviews, and also questionnaires from the VA that the VA is include in the category of moderate resilience because he has tried to understand the meaning of the questions in the questions so that he can answer even though they are complete and precise.

c. Numeracy Ability of Students With High Resilience

In the category of students with high mathematical resilience, researchers determined the subject of AJ to represent as a student of the high resilience category. Subject AJ encountered obstacles to resolving question number 7. We can see Question number 7 in figure 7 below.

Picture 7. Question number 7

In question number 7, what is ask is the circumference of the shoebox in the shape of a block, but the subject AJ answers incorrectly to the formula, it should be that the circumference formula of the beam is 4 x (p + l + t). The error of the answer that AJ gave was incomplete in entering the formula. AJ answer to question number 7 can be seen in figure 8 below.

Picture 8. The results of the answer to AJ question number 7.

In AJ answer to question number 7, the formula that should use in solving this answer is not quite right, the researcher digs deeper by interviewing AJ to find out what obstacles he feels in answering question number 7 and to find out AJ resilience in doing the question. AJ said that he found it difficult to remember the formula completely. AJ continued to write the answer and was sure that the answer was correct. From the test results, interviews, and questionnaires from AJ that AJ belongs in the category of high resilience because he tries to remember and be confident in his own answers. This is in line with the research of the Zanthy, (2018) which explains that students who have mathematical resilience are students whose one of them has the skills to create their confidence. They consider mathematics not an obstacle. Even when the student has difficulties, he will still maintain his confidence.

From the findings in the study, we can say that there are several characteristics of learning barriers that occur in students a. The learning barriers that students experience include obstacles in counting. All categories can feel the difficulty in counting. This shows that these obstacles most often occur in students. This is in line with the research by Darjiani, dkk., (2015), the type of obstacle that most students experience is the obstacle in counting with 49.25% b. Then the student's obstacles in transferring knowledge, are in line with the research of the (Yusmin, 2017) who said that the obstacles experienced by students in determining the steps to solve the problem, because many students immediately answer by writing numbers without performing calculation operations or with other intentions doing calculation operations that they think are correct even though the results are wrong. Then c. the barriers in the understanding of Mathematical language are in line with the research by (S. W. Fitria et al., 2021) students cannot write what they knew and questioned in the question, this makes the

student not understand what the meaning of the question is. Then it deals with resilience, in line with the research of the (Hutauruk, 2020) students who have resilience will maintain a trust in the ability to overcome mathematical difficulties and even develop them. We can develop resilience for students who have unpleasant experiences in mathematics.

CONCLUSION

Based on the results of research and discussion of learning barriers to student numeracy ability based on mathematical resilience, it can be conclude that based on the results of the numeracy ability test for class V students, there are still some students who experience learning barriers, we can see that the characteristics of these learning barriers include difficulties and weaknesses in calculating with large amounts, difficulty in transferring knowledge, and difficulty in understanding mathematical language, namely in understanding the meaning of the meaning of the question in the problem. The need for mathematical resilience for students is to help students in facing solutions to existing problems, because when students have high resilience, it will affect efforts to solve mathematical problems in these problems.

Suggestions from this study are expected to provide input and benefits for readers, especially for teachers and students. The advice from this study for teachers is that it is hoped that teachers can provide better guidance to students who have low numeracy skills and can provide motivation for students to have resilience in learning mathematics. Suggestions for students are expected to be even more active in continuing to learn, especially in numeracy skills, and it is hoped that students can improve mathematical resilience.

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