DIFFICULTIES OF JUNIOR HIGH SCHOOL STUDENTS IN UNDERSTANDING MATHEMATICAL SYMBOLS

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ABSTRAK

Penelitian ini di teliti untuk mendeskripsikan kesulitan siswa dalam memahami simbol matematika. Jenis penelitian ini adalah penelitian deskriptif dengan pendekatan kualitatif. Target audiens ditentukan dengan mempertimbangkan bebrapa faktor selama proses pengumpulan data, antara lain: siswa yang mengalami kesulitan belajar dan menunjukan perilaku tidak mengikuti kegiatan pembelajaran. Teknik analisis data yang digunakan adalah analisis data kualitatif interaktif dan berkesinambungan. Tujuan penelitian ini adalah untuk menjelaskan : 1) siswa mengalami kesulitan dalam memahami simbol matematika dan; 2) pengaruh kesulitan siswa saat menyelesaikan masalah yang berkaitan dengan simbol matematika. Metode penelitian yang digunakan adalah netode penelitian deskriptif kualitatif. Subyek penelitian ini adalah siswa kelas IX sekolah menengah pertama di kabupaten Kendal sebanyak 10 responden. Setelah melalui pertimbangan yang matang, ditentukan bahwa siswa tersebut : 1) mengalami kesulitan dalam menyelesaikan soal; 2) kurang dalam membaca simbol matematika; 3) menarik kesimpulan dari hasil yang diperoleh.

Kata kunci *:kesulitan siswa, simbol, matematika, kemampuan matematika, memahami.*

ABSTRACT

This research was examined to describe students' difficulties in understanding mathematical symbols. This type of research is descriptive research with a qualitative approach. The target audience is determined by considering several factors during the data collection process, including: students who experience learning difficulties and show behavior that does not participate in learning activities. The data analysis technique used is interactive and continuous qualitative data analysis. The purpose of this research is to explain: 1) students' difficulties in understanding mathematical symbols and; 2) the causes of students' difficulties in solving problems related to mathematical symbols. The research method used is a qualitative descriptive research method. The subjects of this research were 10 respondents in class IX junior high schools in Kendal district. After careful consideration, it was determined that the student: 1) experienced difficulty in solving the questions; 2) lacking in reading mathematical symbols; 3) draw conclusions from the results obtained.

Keywords: *student difficulties, symbol, mathematics,mathematical abilities, understand.*

INTRODUCTION

Education fundamental, especially in times of globalization and cultural reform. Education cannot be separated from a person's life. Law Number 20 of 2003 states education is an atmosphere and teaching process that allows students to actively develop religious spiritual power, self-control, character, intelligence and noble moral potential. The effort intentional to create is matter about National, system education manage your own skills, society. Until now, education that is still considered scary is mathematics education.

Mathematics is a subject that is commonly studied by students when taking mathematics subjects from elementary to advanced level, but there are still many students who consider it a scary subject. This warning may occur due to low math learning ability. Fixed things This is certainly a challenge for teachers and students. Another task of a teacher is to carry out learning in class. Studying mathematics is not always successful. Sometimes obstacles occur that lead to failure in learning. Mathematics learning failure is characterized by unsatisfactory learning results, such as school exam results (US), midterm exam results (UTS), or final exam results.

This is in line with the results of the PISA survey (Program for International Student Assessment) in 2012, where Indonesia was ranked 64th out of 65 countries, and in 2015, Indonesia was ranked 63rd out of 70 countries. The average mathematics ability score for Indonesian students is 386, while the international average is 500. This shows that Indonesia still lacks educational results, including in the field of mathematics. In terms of mathematical literacy, Indonesia's ranking in PISA in 2022 also rose five places. Improved position Indonesia shows good resilience to the Covid-19 pandemic. In PISA 2022, the average international reading ability score decreased by 18 points, and Indonesia's score decreased by 12 points, which is in the lower category compared to other countries. This low level of mathematical literacy is also found in the understanding of symbols in mathematics. Symbol mathematics is the most prominent. Symbols are letters, numbers, or characters that represent numbers, operations, or results of mathematical thinking (Fathani, 2009).

Negoro and Harahap (2010) argue that signs or notations are a way to describe or symbolize. Then the symbol can be concluded as representation or symbols for letters, numbers, characters for numerical operations in mathematics. Hutagol (2013) stated problem on PISA 2022 opportunity to express oneself and must follow the teacher's example. Similar to the problem of mathematical symbols, students have poor abilities in reading and recognizing mathematical symbols and only memorize the symbols without understanding them. Difficulty learning reading and arithmetic This is generally caused because students are confused about how to read the symbols in mathematical equations. The students' confusion may be due to the fact that they do not study mathematics every day, so they are not used to reading and understanding mathematics. is that not all mathematics books contain instructions on how to read symbols, so often students only see the symbols but don't in on is characteristic symbols Another possibility know how to read it.

The author takes The learning difficulties of junior high school students in understanding symbols are because the students the writer will research are junior high school level students regarding understanding symbols at these students' schools. And there are still many students in title that Mathematics learning does not develop students' expressive abilities because it is not given in is junior high school level who lack understanding of symbols and reading symbols.

DISCUSSION

1. **Description of Student Difficulties in Learning Mathematics with a scientific approach to observing aspects in terms of mathematical abilities**

   Based on interview results the subject explains that difficulty in approach scientific steps to observe is that students do not understand given and difficult problems to understand the meaning of that problem. In the process learning that occurs in the teacher's field is not at all provide an explanation to students so that students are confused and difficult to understand and interpret what they observe. Students' difficulties in the approach scientific steps to observe is the subject no understand/understand with existing language, images and mathematical symbols in the given problem. According to Lerner (in Abdurrahman, 2012) This is appropriate with the characteristics of that child

have difficulty learning mathematics who often experience difficulties in knowing and use symbols math like (+), (-), (x), (:), (=), (), this interference can caused by interference memory, and by distraction visual perception.

2. **Description of Student Difficulties in Mathematics Learning with a Scientific Approach Questioning Aspects Reviewed From His Mathematical Ability**

   Students' difficulties in the approach The scientific steps to ask are students do not understand the material that will be asked so students cannot create or formulate a question. Matter this is also due to lack of teacher guidance in learning process in class so there are fewer students challenged to apply question. Then there's the lack of it students' self-confidence asked the question, students are given less stimulus in making questions so the student doesn't have self-confidence in submitting and creating a question and more choose to ask a friend yourself rather than asking the teacher.

3. **Description of Student Difficulties in Mathematics Learning with a Scientifi Approach Collecting Aspect Information and Reasoning Reviewed From Ability**

   The math Students' difficulties in the approach scientific steps of collecting information and reasoning are lack of facilities available by students and facilities provided in good schools in the form of reading books and teaching aids. Then trouble the next one is a difficult student and not used to construct his knowledge yourself so after confronted with his problem finally having trouble do this accordingly with Kirk's opinion and Gallagher (in Jamaris, 2014) namely difficulty thinking internal abilities operating capabilities cognitive that includes forming ability concept and associate deep concept formation solve the problem.

4. **Description of Student Difficulties in Mathematics Learning with a Scientific Approach Communicating Aspect Judging from Capability**

   Students' difficulties in the scientific approach step communicating is what students tend to do difficult communicate transfer their knowledge because they are shy, afraid, and doubtful For express their opinion. They are not used to expressing opinions in public. Students are also often distracted and sometimes

don't concentrate on working on the blackboard because the classroom atmosphere is noisy. This is in accordance with the opinion of Kirk and Gallagher (in Jamaris) which states that center hamper Which covers forming associate draft in Mathematics Scientific approach Gather Mathematics Scientific approach Communicate From Ability For or think in ability difficulty attention process in can Study.

Then students also have difficulty presenting the results of their work in the form of pictures. This is in accordance with the opinion of learners (in Abdurrahman, 2012), namely abnormalities in visual perception where children who have difficulty learning mathematics often have difficulty seeing various objects in relation to groups, where in this case students find it difficult to describes a geometric shape whose coordinate points have been determined. The first stage of research is the preparation stage for establishing a research library with the aim of determining the research topic. The research subjects were junior high school students in Kenda Regency. In this research, the researcher created questions in the form of a questionnaire for the students to complete. There were 10 respondents who expressed students' difficulties in understanding mathematical symbols. From the results of the research in the form of tests on students in answering questions about difficulties in understanding symbols, researchers identified question items according to the steps to answer questions and the difficulties involved. faced by students, what causes students to answer the question incorrectly?

Questions number 1

Determine the solution set for the following system of inequalities in two variables.

$$\begin{cases} -x + y \leq 1 \\ y \geq x^2 - 4x + 1 \end{cases}$$

Answers produced by students:

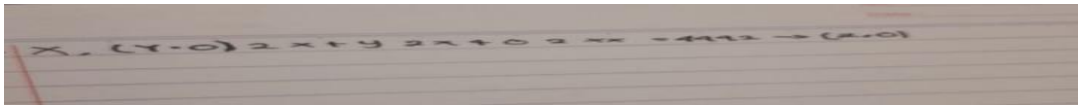

Figure 1

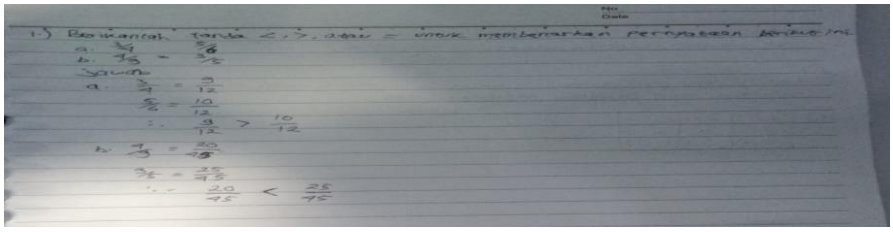

Figure 2

1. The difficulties faced by students in answering number one are: Students cannot understand the text in the question. Students don't understand Meaning the question in question.
2. Students do not understand the symbols of equations and symbol inequality students answer that question. from so that origin
3. Students make mistakes when calculating. Most students answered question 1 incorrectly when looking for a solution, but answered arithmetic operations correctly. The cause of this error is that students' ability to understand symbols is still low, students do not know the difference between less than or equal to, or more than equal to.

Questions number 2

given inequality $x^2 + 3y \geq 12$, How to read this equation?

Answers generated by students:

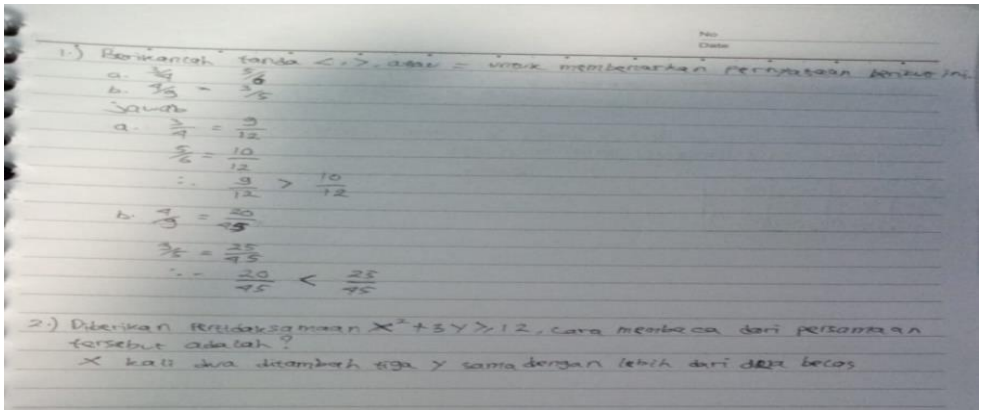

Figure 3

The difficulty in answering question number two is:

1. Students are less able to read the symbols, so they are more likely to answer more than without equals.
2. There are also reasons why students don't understand at all and prefer to sleep while studying notice. Some students answered question number 2 correctly, but

some students could not answer correctly. Some are read backwards, some are not the same, in question number 2 the students were not careful in reading the symbols. In question number 2, the researcher intended to see whether students could read symbols correctly according to mathematical rules. It turned out that some of them were not able to understand them. because it's lacking or mathematical symbols are difficult to understand.

CONCLUSION

Based on the analysis of mathematical symbol solving test questions, there are many reasons why students lack understanding of mathematical symbols, including: 1. Students think that mathematical symbols are difficult to understand; 2. Question Number 2 given inequality $2+ 3 \geq 12$, How to read this equation? Answers generated by students: symbol read Figure 1.3 The difficulty in answering question number two is: 1. Students are less able to read the symbols, so they are more likely to answer more than without equals. Students are still upside down in reading symbols, for example in more than or equal to, the student answers equal to more than; and 3. Students pay less attention to learning, there are students who prefer to sleep rather than listen to the teacher's explanation. Based on the analysis of the test questions on solving mathematical symbols, there are many things that cause students to lack understanding of mathematical symbols. In answering questions number one and two, it can be concluded that understanding symbols Mathematics and inequality reading skills remain significant challenges for many students.

The errors that occur, both in understanding the text in the questions and in distinguishing between equality and inequality symbols, indicate that mastery of basic mathematical concepts is not evenly distributed among students. In question number one, several factors cause intermediate errors others are students' inability to understand the question text, not understanding the meaning of the question, and confusion between equality and inequality symbols. Errors in calculations also often occur, although some students are able to answer arithmetic operations correctly. This indicates deep gap mathematical symbols basic, such as the less than or equal to and greater than or equal to signs. Question number two reveals a similar

problem, where many students are unable to read inequality symbols correctly. Some students don't even understand the symbols at all and choose not to pay attention during learning, there are students who prefer to sleep rather than listen Teacher. Reading reversal neglect show that understanding Which There is explanation Error from in like or with, part symbol, meaning The same that students are less careful and do not understand mathematical rules well. Therefore improve students' ability to understand symbols and concepts done learning that focuses more on basic understanding of symbols and equations. Teachers must ensure that each student understands these basic concepts well before moving on to more complex material. An interactive learning approach and the use of visual aids may help students more easily understand and remember mathematical symbols. Apart from that, it is necessary to provide more varied training understanding reduce do the questions.

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