ANALYSIS OF STUDENTS' MATHEMATICAL COMMUNICATION ABILITY IN SOLVING STORY PROBLEMS IN VIEW OF LEARNING STYLES

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Abstract

The goal to be achieved in this study is to describe students' mathematical communication skills in solving word problems on sequences and series material. This type of research is qualitative research. The data collection used is to provide a test of communication skills to students. The subjects in this study were class XI students, totaling 21 students. Based on the results of students' mathematical communication skills in the high visual learning style, they are in the capable category. Mathematical communication skills with a visual learning style are in the underprivileged category. In the mathematical communication skills of students with low visual learning styles are in the capable category. In the mathematical communication skills of students with high auditory learning styles are in the capable category. In the mathematical communication skills of students with an auditory learning style are in the less capable category. In the mathematical communication skills of students with low auditory learning styles are in the less able category. In the mathematical communication skills of subject students with high kinesthetic learning styles are in the capable category. In the students' mathematical communication skills, the subject of kinesthetic learning styles is in the less capable category. In the mathematical communication skills of subject students with low kinesthetic learning styles in the incapacitated category.

Keywords: Mathematical Communication, Story Problems, Learning Styles. Sequence and series

1 INTRODUCTION

Education is the learning of people's knowledge which is passed down from one generation to the next through training and teaching.

Learning mathematics is a learning process that studies mathematics in order to produce optimal knowledge and skills for oneself or others in real life.

Mathematical communication is a way for students to express and interpret mathematical ideas orally and in writing, either in the form of pictures, tables, diagrams, formulas or demonstrations.

Learning style is a combination of how a person absorbs organized and processed knowledge. According to De Porter and Hernacki (2015) states that "Learning style is a person's way of receiving, absorbing, and processing the information obtained. Learning styles are divided into three types, namely visual, auditory, and kinesthetic learning styles.

Word problems usually cover problems in everyday life. According to Maswar (2019) argues that word problems, namely questions that give mathematical stories to students, can attract the attention of their brains so that they work more optimally.

Based on initial observations that researchers conducted on January 5 2023 at Al-Irsyad High School, information can be obtained that students are less able to understand and find it difficult to communicate students' mathematics into mathematical models, so that in learning mathematics at school there is still a lack of students' mathematical communication skills in completing word problems, especially material on sequences and series based on their learning style. The reason why it is still low is because student scores are still below the average score. The teacher explains that the KKM score is 75.

From the description above, it can be concluded that some students in class XI SMA Al-Irsyad have relatively low mathematical communication skills. So the purpose of this research is to describe the mathematical communication abilities of class XI students of Al-Irsyad High School in the 2022/2023 academic year on the subject matter of Linears and Series

2 METHODOLOGY

This study uses a qualitative approach. This research design is a qualitative research with a descriptive qualitative approach, namely the research method is basically scientific to obtain data with specific goals and uses (Sugiyono, 2018). The research location is SMA AL-Irsyad Tegal. The research subjects were 21 students of Class XI MIPA 2 SMA Al-Iryad. The research instrument was a learning style questionnaire, math word problems for sequences and series material totaling 5 questions that had gone through expert validation.

3 RESULTS

The subjects in this study were students of class XI MIPA 2 SMA Al-irsyad. The research was carried out by distributing a learning style questionnaire to 21 students then carrying out a test of mathematical communication skills totaling 5 pieces of description distributed to 9 students namely 3 students with a visual learning style namely the subject of 3 students with an auditory learning style and 3 participants students with a kinestic learning style.

3.1 The results of the learning style questionnaire

Completion of the learning style questionnaire was carried out by students of class XI Mipa 2 SMA Al-Irsyad consisting of 21 students to obtain data on student learning styles.

Before filling out the questionnaire, students will be given instructions on how to fill out the questionnaire. After the questionnaire was completed by students, students were asked to collect a learning style questionnaire. The results of the student learning power questionnaire stated that it was in accordance with the learning style group. The following are the results of a questionnaire on the learning styles of class XI Mipa SMA Al-Irsyad. he following is a table of the results of grouping these learning styles.

Table 3.1 Results of Grouping Learning Styles

learning style	the number of students
Visual	7
auditory	10
kinestic	4
Total	21

After selecting nine subjects, interviews will be conducted with subjects with visual learning styles, namely AHN, ZMK, CAH, auditory learning style subjects, namely DDA, RZK, MIY, while subjects with kinestic learning styles, namely MFB, RMY, and PPS. to find out whether the nine subjects are in accordance with their learning styles before being given a test of mathematical communication skills

3.1.1 visual learning style communication test result

a) AHN subject visual learning style

1. The ability to communicate situations in the form of story questions, real objects and pictures in writing.

Based on the results of the mathematical communication ability test and the results of the interviews on the 5 questions, you can write down the mathematical model. The AHN subject was able to make a mathematical model to find out the next step in solving the problem. The subject also writes mathematical symbols, for example a statement becomes a variable.

2. The ability to connect situations in the form of word problems, real objects and pictures into the mathematical model.

Based on the results of the test of mathematical communication skills and the results of the interviews on questions number 1 to 5, the AHN subject can write a mathematical model to find out the next step in solving the problem.

3. Ability to provide an explanation of the answer in writing

Based on the results of the mathematical communication ability test and interview results on questions number 1 and 2, the AHN subject could not complete them and the subject also did not provide steps for completion. But in numbers 3 to 5 the subject can solve the problem and can provide steps for solving it. The subject can answer with a coherent answer to the question.

b) Visual Learning Styles subject to ZMK

1. Ability to communicate situations in the form of story questions, real objects and pictures in writing.

Based on the results of tests of mathematical communication skills and subject interviews on questions number 1 to 3, ZMK subjects were unable to write down what was known and asked from the questions. The ZMK subject also could not write down the mathematical symbols that would be used regarding the information obtained in the problem. However, the subject in questions number 4 and 5 can write down what is known and asked in story questions.

2. The ability to connect situations in the form of word problems, real objects and pictures into the mathematical model.

Based on the results of tests of mathematical communication skills and subject interviews on questions number 1 to 3, ZMK subjects were unable to write down their mathematical models. The ZMK subject only wrote down what was known and asked, but it was not clear in writing the mathematical model. However, the subject in questions 4 and 5 can write in the form of a mathematical model in the word problem.

3. Ability to provide explanations for answers in writing.

Based on the results of the mathematical communication ability test and the results of the interviews on questions number 1 to 3, they could not complete them. In numbers 1 and 2 the ZMK subject did not complete the questions. In number 3, the ZMK subject only did the explanation, did not write down the formula and conclusions in the answer. Furthermore, on questions number 4 and 5, the ZMK subject can write down the steps for completing the sequence and series method.

c) CAH subject Visual Learning Style

1. Ability to communicate situations in the form of story questions, real objects and pictures in writing.

Based on the test results of the subject's mathematical communication skills and the results of the interviews on questions number 1, 4 and 5, CAH subjects with a visual learning style can meet the indicators. The subject can write down what is known and asked. The subject also wrote down the mathematical symbols used to continue solving the problem. However, in questions number 2 and 3, the CAH subject did not match the indicators.

2. The ability to connect situations in the form of word problems, real objects and pictures into the mathematical model.

Based on the results of tests of mathematical communication skills and interview results on questions number 1, 4 and 5, CAH subjects with a visual learning style can fulfill the indicators. Subjects can relate situations in the form of word problems to their mathematical models. However, in numbers 2 and 3, the subject could not fulfill the indicators because the subject did not write down the mathematical model for sequences and series.

3. Ability to provide explanations for answers in writing.

Based on the results of the mathematical communication ability test and the results of interviews on questions 1, 3, 4 and 5, the subject was able to solve these questions. The CAH subject wrote down the formula for solving it using the sequence and series method. The subject also wrote the conclusion of the answer to the question. However, in question number 2, the subject could not fulfill the indicator.

3.1.2 Auditory learning style communication test results:

d) Auditory Learning Style of DDA subjects

1. Ability to communicate situations in the form of story questions, real objects and pictures in writing.

Based on the results of the mathematical communication skills test and the results of the subject interviews on questions number 1 to 5, the DDA subject was able to write down what was known and what was asked. The DDA subject also writes down the mathematical symbols used by making an example of a statement into a variable.

2. The ability to connect situations in the form of word problems, real objects and pictures into mathematical models.

Based on the results of the communication skills test and the results of the subject's interviews on questions number 2 to 5, the DDA subject can change the natural situation of the story into a mathematical model related to sequences and series.

3. Ability to provide explanations for answers in writing.

Based on the results of the mathematical communication ability test and the results of the subject interviews on questions number 3 to 5, the DDA subject was able to write down the solution formula, namely the sequence and series method. In questions number 1 and 2 the subject only wrote the sequence and series formulas and did not finish solving the problem. So it doesn't meet the indicators.

e) Auditory Learning Style RZK subject

1. Ability to communicate situations in the form of story questions, real objects and pictures in writing.

Based on the results of the mathematical communication ability test and the results of the subject interviews on questions number 1, 2, 4, and 5, the RZK subject was able to write down what was known and what was asked. The subject also writes the mathematical symbols used for a statement into variables. However, in question number 3 the subject only wrote down the results of the problem solving

2. The ability to connect situations in the form of word problems, real objects and pictures into mathematical models

Based on the results of the test of mathematical communication skills and the results of interviews with the subject on questions number 2, 4 and 5, the RZK subject was able to change the situation in the story into a mathematical model related to sequences and series. In number 1 subject RZK can change to the form of a mathematical model. In number 3 the RZK subject did not write down what was known and was asked to only write down the results of the problem. Therefore in numbers 1 and 3 RZK subjects with moderate learning styles are not in accordance with the indicators.

3. Ability to provide explanations for answers in writing

Based on the results of the mathematical communication ability test and the results of the subject interviews on questions number 4 and 5, the RZK subject was able to write down the solution formula, namely using the sequence and series method. However, the subject did not write a conclusion on the results of the problem. In numbers 1 to 3 the RZK subject did not write down until the completion of the answer to the question

f) Subject MIY Auditorial Learning Style

1. The ability to communicate situations in the form of story questions, real objects and pictures in writing

Based on the results of tests of mathematical communication skills and the results of subject interviews on questions number 1 and 5, only those who can write down what is known and what is asked. But in questions number 2 to 4 subject MIY could not write down what was asked and answered. The subject only wrote down the solution.

2. The ability to connect situations in the form of word problems, real objects and pictures into mathematical models.

Based on the results of the test of mathematical communication skills and the results of the subject's interviews on questions number 1 and 5, the MIY subject was able to change the situation in the story into a mathematical model. So, in numbers 1 and 5, the subject's work results met the

indicators. In questions number 2 to 4, subject MIY could not write down what was known and asked into the mathematical model.

3. Ability to provide explanations for answers in writing.

Based on the results of the test of mathematical communication skills and the results of interviews with the subject on questions number 1, 3, 4, and 5, MIY subjects were able to write down the solution formula, namely the sequence and series models, but the subject did not write conclusions from the

3.1.3 kinesthetic learning style communication test results:

h) Kinesthetic learning style of the RMY subject

1. Ability to communicate situations in the form of story questions, real objects and pictures in writing

Based on the results of the mathematical communication skills test and the results of the subject interviews on questions number 1, 2 and 5, the RMY subject can provide information about what is known and asked about the questions. In numbers 3 and 4 the RMY subject was unable to write down what was known and asked.

2. The ability to connect situations in the form of word problems, real objects and pictures into mathematical models.

Based on the results of the test of mathematical communication skills and the results of the subject interviews on questions number 1 and 5, the RMY subject was able to transform the situation into his mathematical model. In questions number 2 to 4 the RMY subject was unable to write down the mathematical model that was known and asked.

3. Ability to provide explanations for answers in writing

Based on the results of the mathematical communication skills test and the results of the interviews on questions number 1, 4, and 5, the RMY subject was able to write down the steps for completing the sequence and series method. In numbers 2 and 3 the RMY subject could not complete the problem solving.

i) Kinesthetic Learning Style of PPS subject

1. Ability to communicate situations in the form of story questions, real facts and pictures in writing.

Based on the results of the test of mathematical communication skills and the results of interviews with the subject on question number 1, PPS subjects can provide what is known and asked about the questions.

2. The ability to connect situations in the form of word problems, real objects and pictures into mathematical models.

Based on the results of the mathematical communication ability test and the results of interviews with PPS subjects, there were no questions that could be written down as known and asked about these questions.

3. Ability to provide explanations for answers in writing

Based on the results of the mathematical communication ability test and the results of the interviews on questions number 1 to 5, PPS subjects could not write down the solutions to these questions.

4 CONCLUSIONS

Based on the results, it can be concluded that the mathematical communication skills of class IX MIA 2 SMA Al-Irsyad in the visual learning style of the AHN subject are able to communicate mathematical communication. In the mathematical communication skills of ZMK subject students with visual learning styles in the underprivileged category. In the mathematical communication skills of CAH subject students with learning styles are in the capable category. In the mathematical communication skills of DDA subject students with an auditory learning style are in the capable category. In the mathematical communication skills of RZK subject students with an auditory learning style can be categorized as less capable. In the mathematical communication skills of MIY subject students with an auditory learning

style, they are in the less capable category. In the mathematical communication skills of MFB subject students with kinesthetic learning styles in the capable category. In the mathematical communication skills of students subject to the RMY kinesthetic learning style can be categorized as less capable. In the mathematical communication skills of PPS subject students with kinesthetic learning styles are categorized as incapacitated.

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