ANALYSIS OF MATHEMATICAL COMMUNICATION ABILITY ON STATISTICS QUESTIONS BASED ON STUDENT LEARNING STYLE

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Abstract

The aim of this research is to describe students' abilities to communicate mathematically on statistics questions based on learning styles. This research uses a descriptive qualitative approach and this type of research emphasizes quality and has a natural nature or is based on events that occur nearby. The data collection techniques used were filling out learning style questionnaires, teacher interviews, giving mathematical communication skills tests and interviews with research subjects. All students in class VIII C MTs Negeri 5 Brebes, totaling 30 students, completed the student learning questionnaire and mathematical communication skills test and received 6 research subjects based on the learning style questionnaire, each of which consisted of 3 learning styles, namely, 2 students with a visual learning style, 2 students with auditory learning style and 2 students with kinesthetic learning style. The results of the analysis show that the 6 research subjects have different learning styles and levels of mathematical communication skills.

Keywords: Mathematical Communication Skill and Learning Style

1   INTRODUCTION

Mathematics subjects are usually available from Elementary School (SD) to College or University and training to give students the skills to think logically, structured, carefully creative and act associatively in every lesson. Efforts to achieve mathematics learning objectives are by developing 5 main competency standards, namely (1) problem solving, (2) reasoning and proof, (3) mathematical communication, (4) mathematical connections and (5) representation. Mathematical communication skills are the ability to write or use mathematical formulas related to different situations and mathematical ideas presented in the form of pictures and diagrams as well as students' ability to write original answers.

The aim of this research is to describe students' abilities to communicate mathematically on statistics questions based on learning styles. Based on the results of observations with mathematics teachers, namely at MTs Negeri 5 Brebes, they have never grouped learning styles and given mathematical communication ability tests to measure the level of mathematical communication abilities so that mathematics teachers can only see the learning styles and level of students' mathematical communication abilities during the learning process.

Therefore, the existing conditions indicate the need to group learning styles and measure mathematical communication abilities to determine students' learning styles and the level of mathematical communication abilities. So that teachers adjust the method of delivering material to suit students' learning styles and level of communication skills.

Students' ability to communicate mathematically includes the ability to connect real objects, pictures and diagrams into mathematical ideas, the ability to express everyday events in language or mathematical symbols, the ability to explain ideas, everyday situations and mathematical relationships with diagrams, and the ability to communicate conclusions answers to everyday problems according to the results of the statements. Students with effective mathematical communication skills are able to express and easily find options in solving problems.

Teachers can utilize their understanding of learning styles to inform instruction. If the teacher is able to know each student's learning style during learning, then the teacher will be able to explain the learning material more easily. This is because teachers know more about how students absorb and process learning. Therefore, it is hoped that students can learn more easily and optimally to organize the information explained by the teacher.

2 RESEARCH METHODS

Qualitative research is the study of behavior or actions, responses, motivation, understanding, and others according to the experiences of research subjects by describing them using sentences and language in certain contexts and using various natural methods (Moleong, 2008: 6). The subjects of this research were 6 students of class VIII C MTs Negeri 5 Brebes with their respective learning styles. Data collection techniques in this research include: (1) learning style questionnaire, (2) mathematical communication ability test, (3) interview method and (4) documentation. A learning style questionnaire consisting of 15 questions was made based on learning style indicators used to group students according to their learning styles, a mathematical communication ability test consisting of 5 questions was made based on indicators of mathematical communication ability used to measure the level of students' mathematical communication ability, interviews were made to strengthen results of analysis and research documentation in the form of photos, results of learning style questionnaires, results of mathematical communication skills tests and interview results. The analysis technique used in this research is data analysis which is carried out continuously and thoroughly from the beginning to the end of the research and is carried out repeatedly until valid data is found. Activities when analyzing data include data reduction, data presentation and verification.

Before the research instrument is used, it must first be validated by validation experts/validators, then classify the level of validity, namely:

Table 2.1 Test Instrument Validity Results

No Question	r_{count}	r_{table}	Comparison	Information
1	0, 261	0, 381	$r_{count} < r_{table}$	Invalid
2	0, 646	0, 381	$r_{count} > r_{table}$	Valid
3	0, 519	0, 381	$r_{count} > r_{table}$	Valid
4	0, 834	0, 381	$r_{count} > r_{table}$	Valid
5	0, 859	0, 381	$r_{count} > r_{table}$	Valid
6	0, 819	0, 381	$r_{count} > r_{table}$	Valid
7	0, 814	0, 381	$r_{count} > r_{table}$	Valid

According to Susongko (2017:101), the question difficulty index, namely the percentage of subjects who can answer correctly, shows the level of difficulty of each question.

Based on the calculation results with $\alpha = 5\%$ and $n = 27$, the difficulty index for the questions was found as follows:

Table 2.2 Question Difficulty Index

Question (Q)	Mean	Maximum	Total	Category
P1	6,33	9	0,703333	Easy
P2	6,44	11	0,585455	Currently
P3	6,33	7	0,904286	Easy
P4	5,56	8	0,695	Currently
P5	4,04	7	0,577143	Currently
P6	3,78	7	0,54	Currently
P7	3,07	8	0,38375	Currently

3 RESULTS AND DISCUSSION

3.1 Research result

Based on the data obtained from the results of this research, data is presented regarding the results of the learning style questionnaire, the results of the mathematical communication skills test and the results of interviews. To collect research data, the initial step is to give a learning style questionnaire first, before carrying out the mathematical communication ability test, an interview will be conducted with the mathematics teacher, after that, give a mathematical communication ability test and continue with interviews with students who have been selected according to the results of the learning style questionnaire. and results of mathematical communication ability tests.

Based on the research that has been carried out, 30 students in class VIII C MTs Negeri 5 Brebes were obtained who filled out a learning style questionnaire and carried out a mathematical communication skills test and then selected 6 students as research subjects according to their type of learning style.

Students are given questions with statistical material consisting of 5 descriptive questions. Each question is arranged based on indicators of mathematical communication skills.

Table 3.1 Research Subjects

| No | Subject Code | Category | | |
		Learning Style	Learning Style Presentation	Communication Skills Mathematical	Communication Skills Percentage Mathematical
1	RM-VS	Visual	15%	Currently	28%
	YSM-VR		15%	Low	25%
2	MRA-AS	Auditory	15%	Currently	28%
	KSA-AR		13%	Low	23%
3	RDN-KS	Kinestetik	13%	Currently	28%
	NS-KR		13%	Low	17%

3.2 Discussion

The results of data analysis showed that 30 students took the mathematical communication skills test, namely, 3 students were in the high category, 10 students were in the medium category, and 17 students were in the low category. Meanwhile, the results of data analysis showed that 19 of the 30 students in the questionnaire had a visual learning style. There are 8 students with an auditory learning style and 3 students with a kinesthetic learning style.

Of the 30 students in class VIII C MTs Negeri 5 Brebes, the subjects for this research were 6 students. 2 students have a visual learning style, 2 students have an auditory learning style, and 2 students have a kinesthetic learning style. RM-VS subjects have a visual learning style with moderate communication skills or 28%. YSM-VR subjects have a visual learning style with low communication skills or 25%. MRA-AS subjects have an auditory learning style with moderate communication skills or 28%. KSA-AR subjects have an auditory learning style with low communication skills or 23%. RDN-KS subjects have a kinesthetic learning style with moderate communication skills or 28%. NS-KR subjects have a kinesthetic learning style with low communication skills or 17%.

4 CONCLUSION

Based on the research results and discussions that have been explained, it can be concluded that the visual learning style and mathematical communication skills are moderate or 28% of RM-VS subjects have not been able to communicate mathematical communication because they have not reached 5 indicators in 2 questions out of the 5 questions given. The visual learning style and mathematical communication skills are low or 25% of YSM-VR subjects have not been able to communicate mathematical communication because they have not reached 5 indicators on 2 questions out of the 5 questions given.

The auditory learning style and mathematical communication skills are moderate or 28% of MRA-AS subjects have not been able to communicate mathematical communication because they have not reached 5 indicators on 2 questions out of the 5 questions given. The auditory learning style and mathematical communication skills are low or 23% of KSA-AR subjects have not been able to communicate mathematical communication because they have not reached 5 indicators on 2 questions out of the 5 questions given.

The kinesthetic learning style and mathematical communication skills are moderate or 28% of RDN-KS subjects have not been able to communicate mathematical communication because they have not reached 5 indicators in 2 questions out of the 5 questions given. The kinesthetic learning style and low mathematical communication skills of 17% of NS-KR subjects have not been able to communicate mathematical communication and have not reached 5 indicators in 3 questions out of the 5 questions given.

THANK-YOU NOTE

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