

IDENTIFICATION OF STUDENTS' MISTAKES IN COMPLETING SPLDV STORY QUESTIONS FROM VERBAL ABILITY AND NUMERIC ABILITY

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ABSTRACT

This study aims to find out and identify the types of errors and factors that cause mistakes made by students in solving material story problems of the Two-Variable Linear Equation System when viewed from the students' verbal ability and numerical ability. This research was conducted at MA Mansyaul Ulum Cikijing Majalengka class XI. This research uses a descriptive qualitative approach and the qualitative data analysis used is triangulation techniques. The data collection techniques used in this study were the SPLDV written test, the story question writing test, observation, interviews and documentation. The data analysis techniques used are data collection, data reduction, data presentation and drawing conclusions. The results of the study from 6 of the most dominant subjects were 6 person also subjects who experienced final answer writing errors were and 4 person of subjects who experienced misunderstandings were. Subjects who experienced reading errors were 2 person. Subjects who experienced transformation errors 3 person. Subjects who experienced process skills errors 3 person. Factors causing student error as a whole are the lack of explanation from the teacher, the lack of practice of questions in the form of stories, forgetting formulas, rushing and lack of student accuracy in solving problems. The findings in this study are that students who have verbal abilities still experience errors in doing problems, especially in terms of changing story sentences into mathematical models, miscalculations and not knowing the flow of working on the questions. Likewise with students who have numerical abilities, students who have numerical abilities experience relatively few errors compared to students who have verbal abilities.

Keywords : Numerical Ability, Verbal Ability, Mistakes, Story Questions and SPLDV

1. Introduction

Mathematics consists of abstract elements that cannot be defined. Definitions, theorems, axioms, and lemmas are often referred to as deductive science because their statements are true and can be proven in general (Rusefendi, 1988). In other disciplines, so that students can understand and master mathematics well, they need to learn mathematics in the right and proper way. Often found both in the classroom and students about the difficulties of students in solving mathematics, especially in the form of story questions.

Wahyudin (2016) wrote that the question of the story is a question that is presented in oral and written form which describes activities in daily life. Johar & Lubis (2018) defines math story problems as math problems presented in the form of stories. with a real-life context and situation. Math story questions are a form of mathematical

questions that include aspects of reading, reasoning, identifying and finding answers (Darma et al, 2019). At the secondary school level, the story questions that are often encountered by students are stories about systems of linear and variable equations. In the material of the linear equation system, the two variable questions presented are mostly story questions that are related to everyday life.

Zulfah (2017) shows that linear equations of two variables are material that must be studied and understood in order to easily solve problems related to mathematics. When studying linear equations with two variables, students must be able to determine the missing solution to a given mathematical equation, either using the graph method, the substitution method, the elimination method or the mixed method. However, if the problem posed is in the form of story questions, students will have difficulty translating the problem from story sentences into a mathematical model to get a solution. The difficulty of students in solving story problems, especially in terms of the system of linear equations and two variables,

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will cause errors in solving and solving problems in the form of stories. The most common mistakes made are factual errors, where students make mistakes in converting problems in story sentences into mathematical models. According to Runtuahu and Kandou (2017) the cause of the difficulty is because:

1. Factors of physical condition
2. Environmental factors
3. Motivation and attitude factors
4. Psychological factors

In line with his research, Sartin (2005) found that: "students' mistakes in solving story questions are located in and determine what is known, determine what is asked, make mathematical sentence models, calculation errors and write the final answer".

Newmann Error Analysis (NEA) or the Newman error analysis method is an error analysis method in problem solving developed by Anne Newman in 1977. Newmann classified the types of errors based on the Newman procedure as follows:

1. Reading Errors
2. Comprehension Errors
3. Transformation Errors
4. Process Skills Errors
5. Final Answer Writing Errors (Encoding Errors)

Students' mistakes in solving story problems are one of the indicators that determine students' understanding of the basic concepts of mathematics. These errors do not just happen by chance, but often uncomfortable mistakes occur continuously from the basic level to a higher level (Fitriatien, 2019). This is due to the lack of basic abilities that students have, including verbal abilities and numerical abilities. Verbal and numeric abilities play an important role in solving mathematical problems. Because verbal abilities and numerical abilities are basic abilities that students must have to solve a problem, both in learning at school and in everyday life.

According to (Nahak et al, 2019), verbal ability is the ability to quickly accept certain words, including the ability to understand the relationship between words and vocabulary and to remember the words and patterns used to form them. Verbal ability is a person's ability to explain his thoughts and relate the information received to form an opinion (Hapsari, 2019). Verbal ability is a person's ability to understand language both spoken and written (Wahyudin, 2016).

The better or the higher the verbal ability possessed by students, the ability to solve the

student's story problems will be better or higher (Wahyuddin, 2016). According to Irawan (2016), numerical ability is the ability to use numbers, do calculations and turn story questions into numbers that can be calculated using mathematics. Numerical ability is a test related to accuracy and speed when using basic arithmetic operations (Achdiyat, 2017). His numerical ability is the ability related to memory and the ability to count (Aswadi, 2017). The higher the student's numeric ability, the better the mastery of mathematics, especially in solving math story problems (Awaluddin, 2019).

In accordance with the results of observations made by researchers at MA Mansyaul Ulum, researchers found the problem that students had difficulties in modeling story problems in mathematical form which caused students to make mistakes in solving story problems. Mistakes made by students include mistakes in modeling story questions in mathematical models, students being less careful in doing calculations, not being precise in the solving process and students still having difficulties in solving story problems. This is in line with the results of several previous researchers who have conducted research on the ability to solve story problems.

The purpose of this study was to determine the types of errors made by students in terms of verbal abilities and numerical abilities and to determine the factors causing errors made by students in terms of verbal abilities and numerical abilities. This research, according to the author, needs to be done because the results of this study provide an overview of the problems that exist in students and their causal factors. The results of this study can be used as material for teachers in improving student competence so that there are no more mistakes made by students.

Similar studies in discussing student errors in solving SPLDV story questions include:

a. Research conducted by Darma, Suradi Tahmir and Awi Dassa (2018). This study discusses errors in solving story questions on fractional material in terms of the level of verbal ability.

b. Research conducted by Maria Ulfah (2019). This study discusses the form of errors made by students in solving story problems.

c. Research conducted by Sri Jamilah Mukaromah and Maylita Hasyim (2017). This study discusses the effect of verbal, numerical and

spatial abilities on the ability to solve story problems.

The difference in this study is that the researcher wants to know the types of errors and the factors causing the errors made by students in solving the SPLDV story questions and this research is viewed from verbal and numerical abilities.

2. Research Methods

In this research, the researcher uses a qualitative approach and the type of research is descriptive qualitative. Researchers use a qualitative approach so that researchers can find out carefully and deeply regarding the types and factors that cause errors that are often made by students in solving SPLDV story questions. Meanwhile, the use of qualitative descriptive research will make it easier for researchers to present the results in the form of a description, making it easy to read and understand.

Research Time and Place

This research was conducted at one of the Madrasah Aliyah (MA) schools, namely MA Mansya'ul Ulum, which is precisely located in the Wanakerta block RT 006 RW 004 Desa Rawa Kec. Cingambul Kab. Majalengka. 45467. This research was carried out in February 2022. The data collection process was carried out on class XI IPS Madrasah Aliyah (MA) Mansya'ul Ulum academic year 2021/2022

Research subject

The subjects that will be selected in this study use the Purposive Sampling Technique. The prospective subject in this study is class XI IPS at MA Mansya'ul Ulum. The researcher will choose 6 students as research subjects in one class with 1 student who has very high verbal ability, 1 student who has high verbal ability and 1 student who has moderate verbal ability and 1 student who has very high numerical ability, 1 student who has high numerical ability and 1 student who has moderate numerical ability who will identify the types of errors and factors that cause errors in solving story problems based on their verbal abilities and numerical abilities.

Research procedure

1. Verbal Numerical Ability Test

Verbal ability and numerical ability tests are used to determine the level of students' verbal and numerical abilities which will then be carried out by the SPLDV test. Verbal and numerical ability test is a multiple choice test which contains 30

verbal test questions and 30 numerical test questions.

2. SPLDV Story Questions Test

Verbal ability and numerical ability tests are used to determine the level of students' verbal and numerical abilities which will then be carried out by the SPLDV test. Verbal and numerical ability test is a multiple choice test which contains 30 verbal test questions and 30 numerical test questions.

3. Observation

Observations (observations) made by researchers are direct observations. The researcher conducted observational observations to the students when students were working on test questions. The purpose of the observation is to find out how the mistakes made by students when viewed from the verbal and numerical abilities and to find out when working on students' questions are conducive or not.

4. Interview

The interview used in this study is a structured interview which refers to the interview guidelines that have been made by the researcher. Interviews are used to obtain accurate information from respondents. After students complete the SPLDV story test, the researcher will conduct an error analysis based on indicators of verbal ability and numerical ability. After the analysis activity, the researcher will conduct interviews with students who have answered the story form test questions, this is done to find out what factors cause them to make mistakes.

5. Documentation

The researcher collects data using documentation techniques to get more accurate information related to conditions in the classroom, in the form of photos and activities for completing the SPLDV matrix story test questions carried out by students in class and voice recordings when conducting interviews with students.

Data analysis technique

1. Data Collection (Data Collection)
2. Data Reduction (Data Reduction)
3. Data Display (Data Presentation)
4. Conclusion Drawing/Verifying

3. Results and Discussion

Verbal and Numerical Test Results

Written tests of verbal and numerical abilities were carried out to determine the verbal ability and verbal ability test scores possessed by students which would then be analyzed for the types and factors causing the errors. Written tests of verbal and numeric abilities were conducted

offline to 27 students of class XI IPS MA Mansyaul Ulum Majalengka with 60 questions in which there were 30 verbal questions and 30 numerical questions.

Table 4.1 Verbal ability test results

No	Nama	Skor	Kategori
1.	AF	23	Tinggi
2.	AN	23	Tinggi
3.	ATH	29	Sangat tinggi
4.	AN	22	Tinggi
5.	AMS	24	Sangat Tinggi
6.	DL	24	Sangat Tinggi
7.	DAP	23	Tinggi
8.	ES	24	Sangat Tinggi
9.	GA	19	Tinggi
10.	HP	25	Sangat Tinggi
11.	HBP	24	Sangat Tinggi
12.	IPN	25	Sangat Tinggi
13.	IRN	24	Sangat Tinggi
14.	JJ	24	Sangat Tinggi
15.	MY	24	Sangat Tinggi
16.	MW	24	Sangat Tinggi
17.	MAG	16	Sedang
18.	ZI	27	Sangat tinggi
19.	MP	12	Rendah
20.	NH	22	Sedang
21.	OS	16	Sedang
22.	SP	23	Tinggi
23.	SN	23	Tinggi
24.	SBR	24	Sangat Tinggi
25.	SPN	20	Tinggi
26.	SNP	24	Sangat Tinggi
27.	ZF	24	Sangat Tinggi

Table 4.2 Numerical ability test results

No	Nama	Skor	Kategori
1.	AF	10	Rendah
2.	AN	8	Rendah
3.	ATH	28	Sangat tinggi
4.	AN	9	Rendah
5.	AMS	11	Rendah
6.	DL	13	Sedang
7.	DAP	7	Sangat rendah
8.	ES	13	Rendah
9.	GA	17	Sedang
10.	HP	12	Rendah
11.	HBP	14	Sedang
12.	IPN	11	Rendah
13.	IRN	5	Sangat rendah
14.	JJ	8	Rendah
15.	MY	8	Rendah
16.	MW	14	Sedang
17.	MAG	23	Tinggi
18.	ZI	8	Rendah
19.	MP	6	Rendah
20.	NH	22	Sedang
21.	OS	6	Rendah
22.	SP	11	Rendah

23.	SN	12	Rendah
24.	SBR	12	Rendah
25.	SPN	4	Sangat rendah
26.	SNP	11	Rendah
27.	ZF	12	Rendah

SPLDV story test results

After doing a written test of verbal ability and numerical ability, 6 students were taken as subjects with 3 students having very high, high and medium verbal abilities and 3 students having very high, high and moderate numerical abilities. The written test is used to find out the types of student errors seen from how the students process in solving the SPLDV story questions. The written test was conducted offline to 6 students of class XI IPS MA Mansyaul Ulum. After the offline test, the researcher then examined the answers of the research subjects to find out the types of errors made by the research subjects in solving the SPLDV story questions in the form of descriptions. The questions that were tested on the research subjects are contained in Appendix 2. The following table shows the distribution of the types of student errors in solving story questions in the form of a description of the SPLDV material referring to the types of errors according to Newman.

Tabel 4.3 Distribusi jenis kesalahan siswa

Jenis Kesalahan	Analisis Jawaban	Persentase
Kesalahan membaca	Siswa tidak mampu menemukan kata kunci pada soal	33,33%
Kesalahan pemahaman	Siswa maksud dan tujuan dari soal	66,67%
Kesalahan transformasi	Siswa tidak mampu mengubah kalimat cerita menjadi model matematika yang baik dan benar	50%
Kesalahan keterampilan proses	Siswa tidak mampu menyelesaikan soal sesuai dengan urutan penyelesaian yang benar serta siswa masih keliru ketika melakukan perhitungan	50%
Kesalahan penulisan jawaban akhir	Siswa tidak menuliskan jawaban akhir sesuai dengan	100%

yang diminta pada
soalnumerik
sedang**Table 4.4 Presenting the distribution of student errors on each question**

Nomor soal	Jenis Kesalahan	Presentase	Yang Melakukan Kesalahan
1	Kesalahan membaca	33,33%	Verbal tinggi, numerik sedang
	Kesalahan pemahaman	0%	
	Kesalahan transformasi	0%	
	Kesalahan keterampilan proses	16,67%	Verbal sangat tinggi
	Kesalahan penulisan jawaban akhir	0%	
	Kesalahan membaca	16,67%	Numerik sedang
2	Kesalahan pemahaman	66,67%	Verbal sangat tinggi, verbal sedang, numerik sangat tinggi, numerik tinggi
	Kesalahan transformasi	0%	
	Kesalahan keterampilan proses	33,33%	Verbal tinggi, verbal sedang
	Kesalahan penulisan jawaban akhir	50%	Verbal tinggi, verbal sedang, numerik sangat tinggi
	Kesalahan membaca	0%	
	Kesalahan pemahaman	0%	
3	Kesalahan transformasi	50%	Verbal sangat tinggi, numerik sangat tinggi, numerik sedang
	Kesalahan keterampilan proses	0%	
	Kesalahan penulisan jawaban akhir	50%	Verbal sangat tinggi, numerik tinggi,

In general, it can be seen that children who have very high verbal abilities make mistakes in understanding, transformation errors, errors in processing skills and writing final answers. Children who have high verbal ability make reading errors, processing skills errors and writing errors in the final answer. Children who have verbal abilities are making mistakes in understanding, processing skills errors and writing errors in the final answer. Meanwhile, children who have very high numerical abilities make mistakes in understanding, transformation errors and errors in writing the final answer. Children who have high numerical abilities make mistakes in understanding and writing errors in the final answer. Children who have numerical abilities are making reading errors, transformation errors and writing errors in the final answer.

Based on the research results obtained, information about the factors that cause students to make mistakes in solving story questions in the form of descriptions on the SPLDV material obtained from the results of written tests, observations, interviews and documentation in general, namely the lack of explanations from the teacher, lack of practice about story questions, forgetting, not careful and in a hurry when solving story problems. Based on the results of the analysis conducted by the researchers, it can be seen that there are 4 factors that cause students to make mistakes, namely lack of explanation from the teacher, lack of practice about story questions, lack of accuracy, students who do not focus when solving problems and students who are too hasty when doing work. question.

4. Conclusions

1. Children who have very high verbal abilities make mistakes in understanding, transformation errors, writing errors in final answers and errors in processing skills. Children who have high verbal ability make reading errors, writing errors in final answers and processing skills errors. Children who have verbal abilities are making mistakes in processing skills, writing errors in final answers and understanding errors. Children who have very high numerical abilities make mistakes in understanding, transformation errors and writing errors in the final answer. Children who have high numerical abilities make mistakes in understanding and writing errors in the

final answer. Children who have numerical abilities are making reading errors, transformation errors and writing errors in the final answer.

2. Factors that cause children who have very high verbal abilities to make mistakes are the lack of explanation from the teacher, lack of story exercises, do not really understand the material and rush when solving problems. The factors that cause children who have high verbal abilities to make mistakes are forgetting, being less careful, less processing time and still not too proficient in division operations. The factors that cause children who have verbal abilities to make mistakes are not understanding the SPLDV material too well, lack of practice - Latin questions in the form of stories, lack of explanation from the teacher. The factors that cause children who have very high numerical abilities to make mistakes are forgetting formulas, being less careful and less processing time. The factors that cause children who have high numerical abilities to make mistakes are lack of processing time, lack of accuracy and not knowing the order of working on questions (polya stages). The factors that cause children who have numerical abilities to make mistakes are in a hurry to work on the questions, do not really understand the material and lack of exercises in the form of story questions.

Suggestion

Results Based on the research limitations and limitations, the researcher has several suggestions, namely:

1. Further research

Further research, it is better to consider the time to produce more complete data to be studied and in accordance with what is desired by the researcher.

2. Teacher

As for suggestions for teachers, students should be given more in-depth explanations until students really understand the material. In addition, students should also be given story questions more often so that students are more accustomed to understanding and working on them. Results Based on the research, most of the students experienced errors in process skills. Where students do not know the flow of solving the problem. Need to strengthen the material both from the teacher's explanation and in the exercises.

5. Acknowledgments (Optional)

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6. References

All referenced in the article must be listed in the Bibliography section. The Bibliography must contain references derived from primary sources (scientific journals and amounting to a minimum of 80% of the entire bibliography) and published in the last 5 years. Each article contains at least 10 references in the bibliography.

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