



Students Learning Difficulties In Online Learning On One Variable Linear Equation Materials

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Abstract. *The background of this research was found in students of SMP N II Tondano Class VII E who had learning difficulties in learning mathematics on one variable linear equation material through an online learning system. These problems make researchers interested in studying this research further. This study aims to determine the difficulties experienced by students in learning mathematics in PLSV material through an online learning system. This type of research is qualitative research. The data was obtained by giving a story problem description test and conducting student interviews. The research instrument was to provide the story and several interview questions for students online. The study results show that in learning mathematics in PLSV material through an online learning system, students experience difficulties memorizing equation formulas, and arithmetic operations, changing questions into mathematical forms, and difficulties understanding the material provided by the teacher. These problems are caused by 1) lack of interest and motivation in student learning, 2) not having a severe attitude in participating in online learning, 3) student concentration does not focus on learning material*

Keywords: *Learning Difficulties, Online Mathematics Learning, Linear Equations*

Abstrak. Latar belakang penelitian ini ditemui pada siswa SMP N II Tondano Kelas VII E yang mengalami kesulitan belajar dalam pembelajaran matematika pada materi persamaan linier satu variabel melalui sistim belajar daring. Permasalahan tersebut membuat peneliti tertarik untuk mengkaji penelitian ini lebih lanjut. Penelitian ini bertujuan untuk mengetahui kesulitan yang dialami siswa dalam pembelajaran matematika pada materi PLSV melalui sistim belajar daring. Jenis penelitian ini adalah penelitian kualitatif. Data diperoleh dengan memberikan tes uraian soal cerita dan melakukan wawancara kepada siswa. Instrumen penelitian yang digunakan adalah memberikan soal cerita dan beberapa pertanyaan wawancara terhadap siswa bersifat

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daring. Hasil penelitian menunjukkan bahwa dalam pembelajaran matematika pada materi PLSV melalui sistem belajar daring siswa mengalami kesulitan dalam menghafal rumus persamaan, operasi hitung, mengubah soal ke dalam bentuk matematika, dan kesulitan dalam memahami materi yang diberikan guru. Permasalahan tersebut disebabkan oleh: 1) kurangnya minat dan motivasi belajar siswa, 2) tidak memiliki sikap yang serius dalam mengikuti pembelajaran daring, 3) konsentrasi siswa tidak fokus pada materi pembelajaran,

Kata kunci: Kesulitan Belajar, Pembelajaran Matematika Daring, Persamaan Linier

INTRODUCTION

The curriculum in Indonesia, which used to be the 2006 curriculum, has undergone curriculum changes, becoming the 2013 curriculum. Fundamental changes from the 2006 curriculum to the 2013 curriculum include several things, such as structuring mindsets, studying material broadly, deepening material, strengthening processes, and adjusting loads (Mangelep et al., 2013; Makahenggeng et al., 2018). This change was conveyed directly by the minister of education at the time. The 2013 curriculum was stopped for evaluating the 2013 curriculum because of several problems in 2014 (Mangelep et al., 2013; Sari et al., 2018). However, only a short time after, it has been used again by schools until now (Manaming et al., 2018; Domu & Mangelep, 2020).

Permendikbud number 81 A of 2013 says the learning process consists of five processes: asking, observing, gathering information, managing information, and communicating (Bernadet et al., 2018; Domu & Mangelep, 2019; Rompas et al., 2023). From the changes made, teaching students to be more active in participating in class learning is also very true in learning mathematics, especially in junior high schools (Kelung et al., 2018; Kambey & Mangelep, 2019; Boham & Domu, 2021).

There are many ways to improve the quality of mathematics education in Indonesia, including updating the curriculum and providing supporting tools, providing teaching aids, and providing training for mathematics teachers (Mangelep, 2017; Londa & Domu, 2020). However, these various efforts have not yielded encouraging results in improving the quality of mathematics education in this country (Mangelep, 2017; Runtu et al., 2023)

In changing the curriculum, which was formerly the 2006 curriculum and became the 2013 curriculum, the minister of education and even teachers hope that with this curriculum change, students can be more active in participating in ongoing learning, but in learning, especially mathematics learning there are still many teachers who dominate learning. Furthermore, students need to be more active in participating in learning

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mathematics (Mangelep, 2015; Tiwow et al., 2023). Moreover, online-based learning still needs to be solved for students to dominate or play an active role in class due to various problems (Mangelep et al., 2020; Domu et al., 2022).

This curriculum change aims to make students more active in class, but because teachers still dominate learning, even the learning methods used by teachers are not following the 2013 curriculum rules, so students have difficulty participating in learning which aims to make students more active in learning mathematics especially online learning (Sulistyaningsih & Mangelep, 2019; Nangon et al., 2022; Tiwow et al., 2023).

Seeing the background of the problem, until some students had difficulties in learning mathematics, the researcher was interested in studying "student learning difficulties in solving story problems of one-variable online-based linear equations." In this task, the researcher discusses students' difficulties in learning online-based mathematics, which is still difficult in several schools.

METHOD

This research was conducted following the objectives of the research. This research was conducted at Tondano 2 Public Middle School to students in class VII E on January 13, 2022 - January 27, 2022. Data collection in this study was done by giving students essay questions and interviewing students. The research method with a qualitative approach aims to find out the causes of student learning difficulties in learning mathematics in the matter of one variable linear equation.

As for the data collection techniques carried out by researchers in the form of The test result method used to obtain the necessary data is in the form of conclusions about the difficulties experienced by students in learning one-variable linear equations so that they can determine students' abilities in learning one-variable linear equations. Student interviews and data collection by conducting interviews with students aims to collect data. In collecting this data, three students will be selected to be the object of the interview.

The data analysis technique used was: Analysis of student test results which used the test as story questions. The results of this test can determine students' abilities in online-based mathematics learning. The questions given are questions on one-variable linear equation material, with as many as seven questions in the form of essays. In data management, researchers use the formula:

$$P = \frac{f}{n} \times 100\%, \text{ where}$$

P = Percentage
F = Frekuensi
N = Number of respondent

Student interviews were analyzed to dig deeper and personally to review more deeply the obstacles students faced when participating in the learning process with one-variable linear equation material in the online learning system.

RESULT AND DISCUSSION

This research was conducted at Tondano 2 Public Middle School on January 13 – January 27 2022. In this study, the researchers obtained data on students' learning difficulties in solving word problems on PLSV material. The questions given to students totalled seven questions and were followed by 20 students.

After the questions were given and the students answered these questions, the researcher chose three students to be used as objects in interviews with students. Interviews with senior students were conducted to obtain data on what students' learning difficulties are in learning mathematics through an online learning system.

The questions are given to students as a test tool to determine the percentage of students' difficulties. The questions are taken from PLSV material which is given in story form. The following are the steps to find out the percentage of students' difficulties in solving word problems through the online learning system:

- a. Make a table of these percentages
- b. Analyze student difficulties in each question number by using student error tables
- c. Calculating the percentage of difficulties experienced by students seen from the types of difficulties in solving word problems.

Following are the results of the percentage difficulty of the description test given to students:

Table 1. Student mistakes in working on question number 1

No. Problem	Problem Form of Difficulty	F	Percentage %
1	Unable to complete PLSV and convert into mathematical form	15	75
	Erroneous in determining the arithmetic operations	1	5
	Wrong in substituting equations	1	5

From Table 1 above, the errors that were incomplete and could not be converted into mathematical form were 75%, 5% were wrong in determining arithmetic operations, and 5% were wrong in substituting equations.

Table 2. Student mistakes in working on question number 2

No. Problem	Problem Form of Difficulty	F	Percentage %
2	Unable to complete PLSV and convert into mathematical form	15	75
	Erroneous in determining the arithmetic operations	2	10
	Wrong in substituting equations	0	0

Table 2 above shows that errors that cannot be completed and cannot be converted into mathematical form are as much as 75%, and mistakes in determining arithmetic operations are as much as 25%. Those that are wrong in substituting are as much as 0%.

Table 3. Student mistakes in working on question number 3

No. Problem	Problem Form of Difficulty	F	Percentage %
3	Unable to complete PLSV and convert into mathematical form	16	80
	Erroneous in determining the arithmetic operations	1	5
	Wrong in substituting equations	2	10

It can be seen from Table 3 above that errors that cannot be completed and converted into mathematical form are as much as 80%, wrong in determining arithmetic operations as much as 12.5%, and wrong in substituting as much as 25%.

Table 4. Student mistakes in working on question number 4

No. Problem	Problem Form of Difficulty	F	Percentage %
4	Unable to complete PLSV and convert into mathematical form	15	75
	Erroneous in determining the arithmetic operations	5	25
	Wrong in substituting equations	0	0

Table 4 above shows that 75% of the errors cannot be completed and converted into mathematical form, 62.5% are wrong in determining arithmetic operations, and 25% are students who need to be corrected in substituting equations.

Table 5. Student mistakes in working on question number 5

No. Problem	Problem Form of Difficulty	F	Percentage %
5	Unable to complete PLSV and convert into mathematical form	12	60
	Erroneous in determining the arithmetic operations	1	5
	Wrong in substituting equations	0	0

Table 4.5 above shows that 60% of errors cannot be completed and converted into mathematical form, 12.5% need to be corrected in determining arithmetic operations, and 0% are wrong in determining numbers.

Table 6. Student mistakes in working on question number 6

No. Problem	Problem Form of Difficulty	F	Percentage %
6	Unable to complete PLSV and convert into mathematical form	12	60
	Erroneous in determining the arithmetic operations	1	5
	Wrong in substituting equations	1	5

From Table 6 above, it can be seen that the errors that cannot be completed and converted into mathematical form are as much as 60%, they are wrong in determining arithmetic operations as much as 12.5%, and they are wrong in determining the difference as much as 12.5%.

Table 7. Student errors in determining question number 7

No. Problem	Problem Form of Difficulty	F	Percentage %
7	Unable to complete PLSV and convert into mathematical form	12	60
	Erroneous in determining the arithmetic operations	1	5
	Wrong in substituting equations	3	15

Table 7 above shows that the difficulties that cannot be completed and converted into mathematical form are as much as 60%, erroneous in determining arithmetic operations as much as 0%, unable to calculate the number of all objects as much as 37.5%. From the analysis of students' difficulties in completing the essay test on PLSV material in the form of word problems, the researcher found that there were still many students who had difficulty and could not understand the essay tests presented in the form of word problems. Researchers grouped the forms of student errors in answering these questions. For more details, the researcher presents in the form of an analysis table of student essay tests.

Table 8. Percentage of students' difficulties in solving word problems

No.	Form of Difficulty	No. Problem							F	%
		1	2	3	4	5	6	7		
1	Unable to determine and change into mathematical form	75 %	75 %	80 %	75 %	60 %	60 %	60 %	15,15,1 6,15,1 2,12,1 2	69,28 %
2	Unable to determine arithmetic operation	5%	10 %	5%	25 %	5%	5%	5%	1,2,1,5, 1,1,1	8,57%
3	Supporting materials	5%	0	10 %	0	0	5%	15 %	1,0,2,0, 0,1,3	5%

From the analysis of the student essay test data, it can be seen that there are still many students who experience difficulties and do not understand the meaning of the tests given, so many students find it difficult to work on and convert them into mathematical form. In presenting this data, the researcher interviewed four students to review the difficulties for students following mathematics learning in online learning.

Q : What difficulties did you face when participating in online-based mathematics learning?

S1: I do not have any difficulties, sis

Q : Then what is the teacher's explanation of online-based mathematics learning? Is that understandable?

S1: You can understand, sis

Q : For the questions given, what was difficult to do?

S1: There is nothing difficult, sis

From the interviews with the first student, it can be seen that these students have no difficulties in online learning and working on math problems.

Q : What difficulties did you face when you took part in online-based mathematics learning?

S2: When I take online learning, my network is often not good

Q : feel bored during online learning?

S2: often feel bored

Q : How is the teacher's explanation when teaching online-based mathematics? Has the teacher ever asked questions during the lesson?

S2: never asked

Q : When giving questions, what do you think is difficult to do?

S2: Difficult in the calculation part

P2: What makes you difficulty in the calculation

S2: Because often the teacher's explanation is difficult to understand

From the interviews with the second student, it can be seen that during online learning, the student has difficulty in the network section, it is difficult to work on the questions given, especially in the counting section, and it is difficult to understand the teacher's explanation.

Q : When learning mathematics online, did you experience any difficulties?

S3: Online learning is often hindered because the network is not good

Q : When you study mathematics online, do you feel bored?

S3: I often feel bored because, during online learning, there is a lot of playing and turning off the camera. Sometimes I need to focus more when online learning takes place.

Q : How is the teacher's explanation when participating in online-based mathematics learning?

S3: The teacher's explanation is not understood, often when I want to ask a question, the network is lost

Q : When giving questions, what should be done?

S3: It isn't easy because you do not understand the questions given and the teacher's explanation.

For interviews with this third student, these students also had difficulties in the network section. They needed help understanding the teacher's explanation and the questions, so these students had difficulty following online-based learning and working on these questions.

Q : During online-based math learning, what difficulties did you experience?

S4: I needed help understanding the material being conveyed because this is online learning, so the teacher's explanations are difficult to understand. Making

assignments is also difficult because of network constraints, and the teacher's explanations are difficult to understand.

Q : What was the hardest thing to do in working on the questions?

S4: Calculate the problem formula given by the teacher because they do not understand the material provided. There are more difficulties finding or calculating equations.

Q : Do you feel bored when learning mathematics online?

S4: often feel bored

It can be seen that the results of the interviews for this fourth student, these students need help understanding the material presented by the teacher because they cannot follow and understand the teacher's explanation. The internet network could be better, so these students are also difficult to work on if questions are given and difficult to calculate formulas and equations.

From the results of interviews with these students, it can be seen that in online-based mathematics learning PLSV material, many students still experience difficulties, especially in an unstable internet network when participating in online learning, material explanations from teachers that are difficult for students to understand so that when there are still many questions that are difficult to work on the questions given, it is difficult to calculate the similarities of the material.

The factors above make it difficult for students to participate in online-based mathematics learning, so many students need clarification in participating in learning, they feel bored, and they even find it difficult to work on the questions given.

In the story problem tests and the results of the interviews, the researchers were able to describe the students' difficulties in learning mathematics in the material of one variable linear equation (PLSV) and that there were factors that influenced students, so that students had difficulty learning online.

CONCLUSION

Based on the description of the discussion, it can be concluded that the difficulties experienced by students of SMP N 2 Tondano class 7E in learning mathematics in the material of online-based one-variable linear equations are students not being able to understand the explanation from the teacher so that students have difficulty working on the questions given, students have difficulty changing questions to in the form of

mathematics, students have difficulty in determining arithmetic operations, and students are difficult and do not memorize equation formulas. Some of the difficulties experienced by students become an influence, so students experience difficulties in participating in learning mathematics in online-based PLSV material.

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