

ANALYSIS OF STUDENT'S WORKSHEET NEEDS ON MATERIAL PROBLEM SYSTEMS OF LINEAR EQUATIONS WITH TWO VARIABLE FOR MATHEMATICS LITERACY SKILLS

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis kebutuhan untuk mengembangkan lembar kerja peserta didik berbasis masalah dalam melatih kemampuan literasi matematis peserta didik. Penelitian ini menggunakan metode deskriptif kualitatif. Subjek penelitian ini adalah peserta didik dan guru matematika kelas VIII SMP N1 Tirto. Instrumen pengumpulan data menggunakan angket kebutuhan dan wawancara. Hasil analisis yang telah dilakukan menunjukkan bahwa penggunaan perangkat pembelajaran yang sudah ada kurang optimal hal ini menyebabkan kemampuan literasi matematis peserta yang dimiliki kurang optimal. Hal ini dibuktikan dengan peserta didik yang masih kesulitan mengerjakan soal cerita yang berkaitan dengan kehidupan sehari-hari pada materi sistem persamaan linear dua variabel. Berdasarkan alasan tersebut, maka dibutuhkan pengembangan perangkat pembelajaran berbasis masalah dalam bentuk lembar kerja peserta didik untuk melatih kemampuan literasi matematis.

Kata kunci : Analisis Kebutuhan, Sistem Persamaan Linear Dua Variabel, Lembar Kerja Peserta Didik, Kemampuan Literasi Matematis, Masalah.

ABSTRACT

This research aims to analyze the need to develop problem based learner's worksheet to train students mathematical literacy skills. This study used descriptive qualitative method. The subjects of this research were students and mathematics teacher in class VIII junior high school 1 Tirto. Data collection instruments used a needs questionnaire and interviews. The results of the analysis that have been carried out show that the use of existing learning tools is less than optimal. This causes the participants mathematical literacy skills to be less than optimal. This is proven by students who still have difficulty working on story questions related to daily life on linear equation systems two variables material. Based on these reasons, it is necessary to develop problem

based learning tools in the form of learner's worksheet to train mathematical literacy skills.

Keywords : *Needs Analysis, SPLDV, learner's worksheet, Mathematical Literacy Ability, Problems.*

INTRODUCTION

Mathematics is an abstract deductive science that studies numbers or numerical language that uses logical reasoning methods to study relationships between patterns, forms and structures, as well as space (Setiawan et al., 2021). Besides, mathematics is an abstract science, so it would be easier if mathematical learning was associated with real problems (Nisa et al., 2023).

In learning mathematics there are five competences, namely mathematical problem-solving, mathematic communication, mathematician reasoning, mathematician connections, and mathematic representation (Fatimah & Khairunnisyah, 2019). The ability that covers the five competences of the test is mathematical literacy (Maulidina, 2019).

Mathematical literacy is the ability of a person to formulate, apply, and interpret mathematics in solving problems in the real world. According to (Anggoro et al., 2019) mathematical literacy skills students can express individual capacities in formulate, employ, as well as interpret and evaluate. Here are some indicators of the students mathematical skills in formulate, employ, as well as interpret and evaluate (OECD, 2017):

- 1.) Formulate situations/problems mathematically (*formulate*)
 - a.) Identify mathematical aspects of the context of real-world problems and identify important variables.
 - b.) Translating problems into mathematical language.
 - c.) Using such technologies (such as graphical calculators) to describe mathematical relationships in contextual problems.
- 2.) Using concepts, facts, measures, and mathematical reasoning (*employ*)
 - a.) Design and implement a problem-solving strategy.
 - b.) Apply facts, rules, algorithms, and mathematical structures in finding solutions.
 - c.) Create diagrams, graphs, and mathematical contours, as well as extracting mathematic information from it.

3.) Interpret, implement, and evaluate results/answers (*interpret & evaluate*)

a.) Interpreting mathematical results back into the real world context.

b.) Evaluate the relevance of mathematical solutions in the context of real-world problems.

At the moment, the mathematical literacy of students in Indonesia is still low. It is proved by the results of PISA 2018 that Indonesia was ranked 72 of 78 countries at the end of the year (OECD, 2019). One way to train a student's mathematical literacy skills is to use learning devices that are tailored to the needs of both teachers and students.

One of the right learning tools to train the student's mathematical literacy skills is a learner's worksheet. (LKPD). learner's worksheet is a sheet containing tasks – tasks that must be completed by students. In learner's worksheet students receive material, summaries, examples of matters and tasks related to the material, and can find structured clues to understand the given material.

Results of observations and interviews conducted by researchers on December 12, 2023 in Junior High School 1 Tirto, teachers stated that the independent curriculum emphasized literacy activities on each subject and teachers were given the freedom to teach their classmates, teachers more focused on the development of the students in each subject so that in training the students' mathematical literacy skills in the depth of the concepts of mathematics a little optimum. However, there are still some students who also tend to find it difficult to solve a mathematical case if the case presented differs from the example given by the teacher. The learning methods used are still using conventional methods so that learning is still monotonous and teachers as the learning center other than the existing learning devices are not optimum to stimulate the mathematical literacy ability of the pupils because they still use books and packages that are not connected with the ability to literate mathematics. Some materials on mathematical subjects are difficult to understand by the students of Junior High School 1 Tirto in particular in linear equation systems two variables (SPLDV).

Similar research once conducted by (Soraya & Aisyah, 2022) stated that mathematics teachers agree that learner's worksheet Problem Based Learning learning media should be developed to help in improving the numbering ability of

pupils. The similarity with this research is to analyze the need for the use of learner's worksheet. The difference with this research is the selection of mathematical learning material which in the study is the System of Linear Equations of Three Variables whereas in this study the Linear System of Equation of Two Variables.

In this research use qualitative descriptive research. The stage in this study is based on the results of initial observations at a school located at Junior High School 1 Tirto. The subjects of this research included students and mathematics teachers of the grade eight of Junior High School 1 Tirto. To understand the learning process, the obstacles faced by teachers and pupils, the characteristics of pupils and the use of learner's worksheet on the material of two variable linear equation systems. This study will be conducted on December 12, 2023 in the 2023/2024 academic year. The data collection technique used in this research is through need raising and interviews. The needs raising, and the interviews carried out in this study are given to mathematics teachers as well as students in the eighth grade. The second phase is to conduct interviews with teachers and students to add information about the implementation of the curriculum, the learning process, the obstacles encountered by the teacher and students in the process of learning, as well as the characteristics of the students. The data obtained is then analyzed descriptively and qualitatively. The focus of this research is to describe the need for problem-based learner's worksheet to train the student's mathematical literacy skills.

Based on the background description, the researchers are encouraged to analyze the problem-based learner's worksheet needs on the linear equation system of two variables to develop the student's mathematical literacy skills. In this study, the needs of learning devices are analysed before they are developed and developed. This analysis is done so that the learning tools developed can work properly to the learning goals. The purpose of this survey is to analyze the needs of developing learning tools.

DISCUSSION

Doing this research is to find out the need analysis of the Students Working Sheet (LKPD) based problem in training the mathematical literacy skills of the students on the material of the linear equation system of two variables. This research data is

obtained through interviews, and requests. Here are the results of the need-raising data as well as the interviews conducted by the researchers:

i. Lift Needs

In this study, the elevator needs of learning devices were given to mathematics teachers and students of the eighth grade. The following are the results of the distribution of elevators needs of teachers which can be seen in Table 1 and elevators need of students that can be found in Table 2:

Table 1. Elevate Learning Device Needs to Teachers

No	Question	Yes	No	Desc.
1.	Did you use a learning device when learning mathematics?	100%		LKPD, Video learning and textbooks
2.	Do you have a textbook or other handbook to teach mathematics?	100%		
3.	Did you always use those books to teach mathematics?	100%		
4.	Did you use any other textbooks besides those already available?	100%		
5.	Are you looking for other learning sources to help students understand mathematical material?	100%		Google and Learning Videos
6.	Is the existing book difficult to understand by the student in studying mathematical material?	100%		
7.	Did you ever use LKPD when you were studying math?	100%		
8.	Can the LKPD used help students understand the concept of two variable linear equation systems?	100%		
9.	Do you always associate mathematics with day-to-day activities?	100%		
10.	Are students always active in the learning process of teaching mathematics?	100%		
11.	Are there any students who have not reached the KKM in mathematics lessons?	100%		
12.	Do you have any difficulty understanding the material through the teaching materials and methods used?	100%		
13.	Did you ever use a Problem Based Learning learning model when you were studying mathematics?	100%		
14.	Can a Problem Based Learning learning model help students understand the two-variable linear equation system material?	100%		
15.	Did you believe that the PBL-based learner's worksheet was developed to help students understand the concept of a two-variable linear equation system?	100%		

Table 2. Increase Learning Device Needs in Students

No	Question	Yes	No	Desc.
1.	Does your teacher use learning devices when learning mathematics?	100%	0%	LKPD, Video learning and textbooks
2.	Do you have a textbook or other handbook for learning mathematics?	100%	0%	
3.	Did your teacher always use those books to teach mathematics?	68,75%	31,25%	
4.	Does your teacher use other textbooks than those already available at school?	0%	100%	
5.	Are you looking for other learning sources to help understand mathematical material?	78%	22%	Google and Learning Videos
6.	Do you have any difficulty understanding the mathematical material of the book?	87,5%	12,5%	
7.	Did your teacher ever use learner's worksheet when learning mathematics?	100%	0%	
8.	Can the learner's worksheet used by your teacher help you in understanding the concept of Two Variable Linear Equation System?	93,75%	6,25%	
9.	Do you have trouble associating with day-to-day activities?	84%	16%	
10.	Are you enthusiastic about studying teaching mathematics?	53%	47%	
11.	Do you think the matter of the linear equation system of two variables is easy to understand?	37,5%	62,5%	
12.	Do you have any difficulties understanding the material through the teaching materials and methods used by the teacher?	43,75%	56,25%	

ii. Interview

Here are the results of interviews conducted by the researchers with mathematics teachers and eight students in the grade VIII :

1. The curriculum used for the grade VIII in Junior High School 1 Tirto uses an independent curricular that has been running for 2 years. The learning process carried out by teachers is usually a question-and-answer model, lectures, or discussions using learning models such as discovery learning, project based learning and problem based learning.
2. Students are not too active at the time of learning in the classroom, so the teacher should provide a question-like stimulus to fish the student's activity during the learning in classroom.
3. Teachers use teaching materials such as modules made by themselves, Students Work Sheets (LKPD) made by their own to support learning as well as teaching material through references from the Internet.

4. Teachers have difficulties when learning in class, which is to make concepts from abstract into real form, because students still have difficulty in modeling mathematical forms.
5. Students have not yet been able to model mathematical forms through storytelling issues on everyday issues, especially on the matter of two variable linear equation systems (SPLDV).
6. Factors that support and hinder teachers when learning the Two Variable Linear Equation System (SPLDV) are the number of literacy sources used to solve the problem, but still not stable in terms of finding the right material or the right Students' Sheet of Work (LKPD) to use in solving the problem..
7. Teachers use the teaching modules created by the mathematics team of the school to apply to the learning of the Two Variable Linear Equation System (SPLDV). But there are obstacles in the search for material, content, argumentation, systematics and practice on it.
8. Students responded positively to the use of the material because the material on the big can be summarized more clearly, but must still be refined in order to be more effective.
9. Teachers argue that a good teaching material used for two variable linear equation systems (SPLDV) should be consistent with learning about literature that is contextualized in real life to solve the problem, that is, contextual teaching materials that students can use in solving everyday problems related to the two-variable lineary equation system. (SPLDV).
10. Teachers argue that the problem based learning model teaches us how to solve a problem, so by asking a problem first, students are more interested in trying to resolve it, so it can stimulate students to ask about things to do according to the system.
11. The teacher argued that the criteria for the activity of the Students Working Sheet (LKPD) as the teaching material of the Two Variable Linear Equation System (SPLDV) to train the mathematical literacy of students are very good, because they can give the students an idea, a way of completion so that after learning continues students can apply them in everyday life which is the main goal.

12. Teachers argue that the Student Work Sheet (LKPD) based Problem Based Learning (PBL) material is suitable to be developed in Junior High School 1 Tirto saw from the existing obstacles, thus enabling it to be solved with the teaching material.
13. Students need interesting learning tools to facilitate the understanding of mathematical material.
14. Students argued that the Students Working Sheet (LKPD) became one of the learning tools needed during learning activities.
15. Students argue that the matter of two variable linear equation systems (SPLDV) is a mathematical matter that is difficult to understand.

Speech

i. Lift Needs

As a result of the requirements raised by the researchers in Table 1 and Table 2 to teachers and students, it can be concluded that:

1. Teachers need to develop a Problem Based Learning (PBL) Students Sheet of Work (LKPD) to help students understand the concept of Two Variable Linear Equation System (SPLDV). This is demonstrated through the acquisition of a 100% presentation on the timetable for the development of a Student's Work Sheet (LKPD) based on Problem Based Learning (PBL) to assist students to understand the concepts of two variable linear equation system (SPLDV) in Table 1 of the teacher's needs.
2. Students still tend to have difficulty understanding the mathematical material from the books provided by the school. This was demonstrated through the acquisition of a presentation of 87.5% that stated that students have difficulties understanding the maths from the book in Table 2 of the students' needs. In addition, a presentation was obtained 100% about the learning results of students who have not reached the KKM in mathematics lessons in Table 1 of the teacher's needs.
3. Students tend to have difficulty understanding mathematical matters in class VIII especially on matters of two-variable linear equation systems. This is demonstrated through the acquisition of a 62.5% presentation that

states that matter of two variable lineary equation system is not easily understood in Table 2 of elevated student needs.

4. The learning devices used by teachers to teach are still monotonous because they only use books provided by the school. It was proven through the acquisition of a presentation of 68.7% that stated that teachers always use books to teach on Table 2 to raise the needs of the students.

ii. Interview

The results of interviews conducted by the researchers with mathematics teachers and eight students in the eighth grade can be concluded as some information. First of all, teachers have difficulty in learning in class, in making the concepts of abstracts into real forms, because students have not been able to model mathematical forms through stories on everyday problems, especially on the material of the Two Variable Linear Equation System (SPLDV). Secondly, in terms of the availability of learning tools that have been made by the mathematics team of the school to be applied at the time of learning the two variable linear equation system (SPLDV) there are still obstacles in the search for material, content, contents, systematics and training of the matter. Thirdly, the material, the two-variable lineary equation systems (SPDLV) is a mathematic material that is difficult to understand.

CONCLUSION

Qualitative descriptive research in this study is the analysis of the needs of the learning equipment of the linear equation system of two variables. It aims to train students the mathematical literacy skills required in the learning process. This was demonstrated by the analysis that has been done that the use of Learning Device Students Work Sheet (LKPD) has not been able to stimulate student literacy skills and is not optimized so that teachers and students need learning devices such as Students Work Sheets (LKPD) that can give students an overview as well as a solution in a smooth way so that after learning continues students can apply it in everyday life which is the main objective. Therefore, it is necessary to develop a learning device such as Student Students Work Sheets (LKDP) based on problems that can train mathematical literacy ability.

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