Kemampuan Literasi Matematika Siswa Berdasarkan Gaya Belajar

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Abstrak

Hasil OECD-PISA menyatakan bahwa kemampuan literasi matematika siswa di Indonesia masih tergolong rendah. Tujuan Penelitian ini adalah: 1) Menganalisis kemampuan literasi matematia siswa dalam menyelesaikan soal Sistem Persamaan Linier Dua Variabel (SPLDV) ditinjau dari gaya belajar siswa; 2) Mengetahui faktor penyebab kurang maksimalnya kemampuan literasi matematika. Metode yang digunakan pada penelitian ini yaitu deskriptif kualitatif. Subjek penelitian merupakan siswa kelas VIII di SMPN 1 Beber yang berjumlah 23 siswa dengan subjek untuk diwawancarai adalah 9 siswa yaitu 3 siswa dengan gaya belajar visual, 3 siswa dengan gaya belajar auditori, dan 3 siswa dengan gaya belajar kinestetik. Penilaian kemampuan literasi matematika berdasarkan 3 indikator kemampuan literasi matematika yaitu *formulate*, *employ* dan *interpret*. Hasil penelitian ini menunjukkan bahwa : 1) Pada penyelesaian soal SPLDV, kemampuan literasi matematika siswa dengan gaya belajar auditori lebih baik dibandingkan dengan kemampuan literasi matematika siswa dengan gaya belajar yang lainnya; 2) Faktor penyebab kurang maksimalnya kemampuan literasi matematika yaitu faktor personal dan faktor intruksional.

Kata Kunci: gaya belajar, kemampuan literasi matematika, SPLDV

Students' Mathematical Literacy Skills in Terms of Learning Styles

Abstract

The results of the OECD-PISA state that the mathematical literacy skills of students in Indonesia are still relatively low. The objectives of this study are: 1) To analyze students' mathematical literacy skills in solving Two-Variable Linear Equation System (SPLDV) problems in terms of student learning styles; 2) To find out the factors causing the less than optimal mathematical literacy skills. The method used in this study is descriptive qualitative. The study subjects were 23 students in grade VIII at SMPN 1 Beber with 9 students interviewed, namely 3 students with a visual learning style, 3 students with an auditory learning style, and 3 students with a kinesthetic learning style. Assessment of mathematical literacy skills is based on 3 indicators of mathematical literacy skills: formulate, employ, and interpret. The results of this study indicate that: 1) In solving SPLDV problems, the mathematical literacy skills of students with an auditory learning style are better than those with other learning styles; 2) The factors causing the less than optimal mathematical literacy skills are personal factors and instructional factors.

Keywords: learning style; mathematical literacy skills; two-variable linear equation system

INTRODUCTION

According to the National Council of Teachers of Mathematics (NCTM) (2020)Mathematics learning has to involve five abilities: problem-solving, communication, reasoning, connection, and representation. These five competencies or abilities are included in mathematical literacy. By developing these five skills, students can gain a deep understanding of mathematics and apply mathematical concepts in various situations. According to Rismen et al. (2022) Mastery of mathematical literacy skills is essential for students, considering that this ability allows them to take advantage of practical applications of mathematics that are very relevant in daily activities, use effective approaches in solving problems, evaluate the correctness of the results obtained, and be able to analyze situations and draw conclusions appropriately.

However, Indonesian students' mathematical literacy skills need a lot of attention. The study results announced by PISA in 2018 published by the Organization for Economic Cooperation and Development (OECD) found that Indonesian students had reading skills that reached an average score of 371, while the average OECD score was 478. It is ranked 74th or sixth from the bottom. This means that follow-up needs to be done to improve the reading skills of Indonesian students. As for math, Indonesian students achieved an average score of 379, while the average OECD score is 487. It is in position 73 or ranked seventh from the bottom. Overall, it can be concluded that Indonesia is still below the average score obtained in general. Development needs to be done to improve or increase students' mathematical literacy skills.

Consistent with research Rismen et al. (2022) Literacy skills at SMP N 14 Padang are still relatively low. It can be observed that there are students who face difficulties in solving the problems given. Students also seem confused by the story problems given, and students also face important information or statements in the problem, indicating that students have not fulfilled the indicators of the communication process in mathematical literacy skills. The same thing also happened in the research of Masfufah & Afriansyah (2021), that students' mathematical literacy skills are still relatively low.

Learning styles play an important role as one of the factors that support the development of mathematical literacy skills (Willingham et al., 2015). The selection of an appropriate learning style will provide support to students in assimilating information, which in turn will facilitate their learning and communication process. By understanding students' learning styles, teachers can provide guidance in the learning process according to each student's learning style (Cuevas, 2015; Lopez & Schroeder, 2008). This will help students understand the subject matter more easily and improve student learning outcomes (Edimuslim et al., 2019). Edimuslim et al. stated that students' learning styles also affect mathematical literacy skills. Some common types of learning styles include learning through hearing (auditory), vision (visual), and physical movement (kinesthetic). Since students have differences in the way they absorb the material taught by educators, educators need to understand students' learning styles.

The differences in student learning styles make it difficult for teachers to deliver their lessons. As each student has a different learning style, the teacher has an important role in paying attention to his students when learning takes place (Cuevas, 2015; Lopez & Schroeder, 2008). A mathematics topic that is often applied in everyday life is the Two-Variable Linear Equation System (SPLDV). SPLDV is a mathematical concept that describes the relationship between two linear equations with two interrelated variables. Although SPLDV may look like an abstract math concept, it has various applications in everyday life. With the use of SPLDV, students can apply mathematical concepts to understand and solve various real-world problems that are often encountered in everyday life.

Some studies on mathematical literacy focus on general cognitive and problem-solving abilities, often neglecting how individual differences in learning styles influence students' ability to engage with and solve mathematical problems. Few studies have systematically explored the interplay between learning styles (e.g., visual, auditory, kinesthetic) and mathematical literacy skills, leaving a gap in understanding personalized instructional strategies. Based on the background that has been described, the purpose of this study is to analyze students' mathematical literacy skills in solving SPLDV problems in terms of students' learning styles and to find out the factors influencing mathematical literacy skills. By investigating how different learning styles influence mathematical literacy, the study contributes to

the development of tailored instructional strategies that accommodate diverse learners. This can enhance teaching effectiveness and improve student outcomes.

METHOD

This study was qualitative. This approach aims to collect facts and characteristics of objects or research subjects with high accuracy and describe them systematically (Sugiyono, 2018). This research applied a descriptive qualitative approach whose purpose is to describe the level of ability of the mathematical literacy level in the PISA study in terms of students' learning styles.

The subjects of this study involved 8th-grade students of SMP Negeri 1 Beber. The research subjects were selected as the subjects were considered capable of communicating well orally. They also have learned SPLDV topics. In addition, the subject must also be able to cooperate and provide complete information needed by the researcher, so that the researcher can obtain the information needed to analyze students' mathematical literacy skills. There were three steps in this study. First, the students were given a learning style questionnaire. After categorizing students based on their learning style, a test of mathematical literacy skills on the SPLDV topic was provided to them. The researchers then chose 9 students to be interviewed, three students for each learning style. The three students chosen in each learning style category have high, medium, and low mathematical literacy scores. The interview was used to find out the factors influencing students' mathematical literacy skills.

The learning style questionnaire was adopted from Rivai (2022). In this study, the indicators used to measure students' mathematical literacy skills were according to Schleicher, Zimmer, Evans, & Clements (2009). There are three indicators to measure students' mathematical literacy skills as presented in Table 1.

Table 1. Indicators of Mathematical Literacy Skills

Indicators	Mathematical process
Formulate (F)	Identifying mathematical aspects in problems
	Translating a problem into mathematical language or mathematical representation using appropriate symbols, images, or modeling
Employ (E)	Designing strategies to find mathematical solutions
	Applying mathematical concepts necessary during the process of finding solutions
Interpret (I)	Reinterpreting the solution results obtained in the context of real-world problems
	Explain the reasons why the results or conclusions are appropriate to the context of the given problem.

The data analysis technique used in this study adopted the framework of Miles & Huberman (1984), consisting of data reduction, data presentation, and conclusion drawing. Data reduction includes summarizing data, highlighting important or basic information, grouping data based on the facts revealed, directing analysis, and eliminating relevant or unnecessary data. In this study, data reduction was applied to categorize students based on their learning style, and chose 9 students to be interviewed, three students for each learning style. The three students chosen in each learning style category have high, medium, and low mathematical literacy scores. After the data reduction process is complete, the next step is to disclose the data systematically and in a structured manner. A good way of presenting data helps researchers and readers to understand the information better, pay attention to the relationships between data elements, and get a more complete picture of the findings. The data that is disclosed or presented includes the results of a questionnaire on learning styles, answers to tests, and information from interviews that have been realized. Data presentation is useful to organize information that has been simplified so that the information becomes easier to understand. The next step after data presentation is to make a summary or conclusion based on the analysis conducted, this involves linking the findings found with the initial research questions or research objectives and considering the relevant context. Concluding also includes meaningful interpretations of the findings and their implications in a broader context. This process of conclusion involves extracting the core of the data and formulating it in a short, concise, and clear sentence, which includes significant information.

RESULTS

Students' Mathematical Literacy Skills in Terms of Learning Styles

The classification of students' learning styles is based on the results of the learning style questionnaire test. Based on the diagram in Figure 1, the number of students classified as visual learning styles is 3 students (13%), the number of students classified as auditory learning styles is 10 students (43.5%), and the number of students classified as kinesthetic learning styles is 10 students (43.5%). Accordingly, 43.5% of students are more inclined to learn through conversation and dialog are auditory learning styles, and 43.5% of students tend to understand information better through doing actions, experiments, and physically interacting with learning materials are kinesthetic learning styles. This percentage shows that the student's learning style profile is dominated by students with auditory and kinesthetic learning styles.
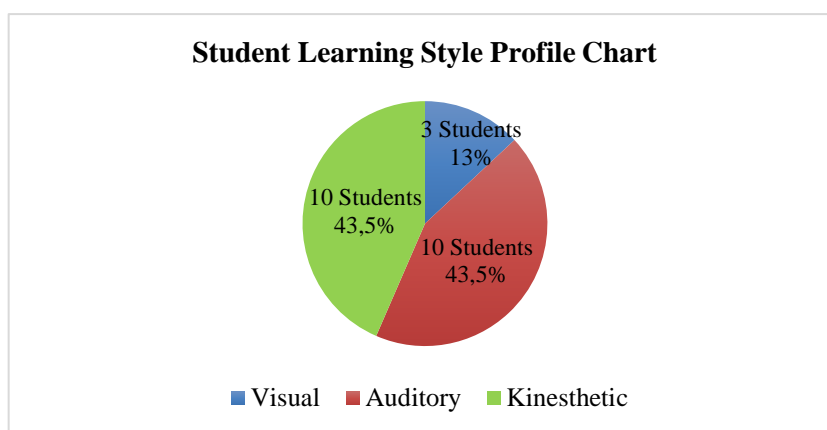

Figure 1. Student Learning Style Profile

The profile of students' mathematical literacy skills is seen from the results of the SPLDV mathematical literacy test with a total of 23 students in grade VIII at SMP Negeri 1 Beber presented in Table 2. The tests that have been taken by students have obtained varying results. Students' mathematical literacy skills are based on 3 indicators of mathematical literacy skills: formulate, employ, and interpret. The following are the results of the student's mathematical literacy test.

Table 2. The result of Students' Mathematical Literacy Skills

Student	Learning Style	Math Literacy Score	Category	Student	Learning Style	Math Literacy Score	Category
1	Visual	56	Intermediate	13	Auditory	12	Low
2	Visual	40	Intermediate	14	Kinesthetic	76	High
3	Visual	40	Low	15	Kinesthetic	70	Intermediate
4	Auditory	82	High	16	Kinesthetic	66	Intermediate
5	Auditory	78	High	17	Kinesthetic	64	Intermediate
6	Auditory	74	High	18	Kinesthetic	64	Intermediate
7	Auditory	58	Intermediate	19	Kinesthetic	58	Intermediate
8	Auditory	54	Intermediate	20	Kinesthetic	50	Intermediate
9	Auditory	42	Intermediate	21	Kinesthetic	50	Intermediate
10	Auditory	40	Intermediate	22	Kinesthetic	40	Intermediate
11	Auditory	34	Low	23	Kinesthetic	40	Intermediate
12	Auditory	30	Low				

Visual Learning Style

Table 3 shows students' mathematical literacy in the topic of two-variable linear equation system with visual learning styles:

Table 3. Mathematic Literacy Skills in Visual Learning Style

Subject	Question 1			Question 2			Question 3			Question 4			Question 5		
	F	E	I	F	E	I	F	E	I	F	E	I	F	E	I
V01	(-)	✓	✓	(-)	✓	(-)	(-)	✓	(-)	(-)	(-)	(-)	✓	✓	(-)
V02	(-)	(-)	(-)	✓	✓	✓	(-)	(-)	(-)	(-)	(-)	(-)	✓	(-)	(-)
V03	✓	(-)	(-)	✓	(-)	(-)	(-)	(-)	(-)	✓	(-)	(-)	(-)	(-)	(-)

Note: ✓ : fulfil (-) : not fulfill

Based on Table 3, subject V01 with a visual learning style that has a high cognitive level has the best mathematical literacy ability among other subjects in solving SPLDV problems. This is proven when the subject can fulfill the employ indicator from questions number 1, 2, 3, and 5. The score obtained by the subject is 56. From the score obtained, it can be stated that subject V01 has literacy skills in the moderate category in solving SPLDV problems.

The following is the answer of one of the visual learning style students in solving the SPLDV problem.

Answer to Question Number 1

Known: selling 2 types of rice as much as 45 kg
the price of rose rice is Rp9.000/kg
the price of orchid rice is Rp9.400/kg
Asked: how many kg of rose rice were sold?
x = rose rice
y = orchid rice

$$x + y = 45 \qquad \times 9000 \qquad 9000x + 9000y = 405000$$
$$9000x + 9400y = 413000 \qquad \times 1 \qquad 9000x + 9400y = 413000 \text{ -}$$
$$-400y = -8000$$
$$y = \frac{-8000}{-400}$$
$$y = 20$$

$$x + y = 45$$
$$x + 20 = 45$$
$$x = 45 - 20$$
$$x = 25$$

So the amount of rose rice sold is 25 kg

Figure 2. Answer to Question Number 1 Research Subject V01

Based on the interview and the test results as described in Figure 2, subject V01 has fulfilled the employ and interpret indicators by designing strategies and applying them well and the subject can also make the right conclusions and can explain the conclusions that have been made. The subject was also able to explain the reasons for the conclusions made appropriately. However, the subject has not fulfilled the formulate indicator, because based on the results of the interview the subject is less careful in reading the problem so that there is information that is missed that should be written on the known.

Answer to Question Number 2

Figure 3. Answer to Question Number 2 Research Subject V01

Based on the results of the interview and the test as shown in Figure 3 above, subject V01 was only able to write the employ indicator, which can apply and design mathematical concepts that are by the problem. The student has not been able to write the formulate and interpret indicators, this is because the student is not used to working on problems according to the steps and is in a hurry to do the problem.

Answer to Question Number 3

Figure 4. Answer to Question Number 3 Research Subject V01

Based on the results of the interview and the test as illustrated in Figure 4, subject V01 was only able to fulfill the employ indicator, which can apply and design mathematical concepts by the problem. The student has not been able to formulate and interpret indicators because the subject is not used to working on problems according to the steps and is in a hurry to do the problem. Teachers also do not accustom students to working on problems according to the steps.

Answer to Question Number 4

In question number 4, the subject did not write anything on the answer sheet. Based on the test and interview results, subject V01 has not fulfilled the formulate, employ, and interpret indicators. In problem number 4, the student is confused in determining what is known and asks from the problem then problem number 4 looks unfamiliar so it is difficult to write the answer.

Answer to Question Number 5

Figure 5. Answer to Question Number 5 Research Subject V01

Based on the results of the interview and the test as shown in Figure 5, it can be concluded that in question number 5, subject V01 can fulfill the formulate and employ indicators well, namely being able to understand and solve problems with the right steps but has not fulfilled the interpret indicator because the student cannot interpret the problem-solving.

Auditory Learning Style

Table 4 shows students' mathematical literacy in the topic of a two-variable linear equation system with auditory learning styles.

Table 4. Mathematic Literacy Skills in Auditory Learning Style

Subjek	Question 1			Question 2			Question 3			Question 4			Question 5		
	F	E	I	F	E	I	F	E	I	F	E	I	F	E	I
A01	✓	✓	✓	✓	✓	✓	(-)	✓	✓	✓	(-)	(-)	✓	(-)	(-)
A02	(-)	✓	✓	✓	✓	✓	✓	(-)	(-)	✓	(-)	(-)	✓	✓	✓
A03	✓	(-)	(-)	✓	✓	✓	(-)	(-)	(-)	✓	(-)	(-)	✓	(-)	(-)

Note: ✓ : fulfil   (-) : not fulfill

Based on Table 4, subject A01 with an auditory learning style who has a high cognitive level has the best mathematical literacy ability among subjects in solving SPLDV problems. This is proven when the subject can fulfill 3 indicators of mathematical literacy ability formulate, employ, and interpret on questions 1 and 2. The score obtained by the subject is 82.

The following is the answer of one of the auditory learning style students in solving SPLDV problems.

Answer to Question Number 1

Based on the test and interview results, subject A01 has fulfilled all mathematical literacy indicators well. The strategy used by student A01 in solving the problem was similar to that of V01 as presented in Figure 2. The student can identify and use mathematical symbols, design strategies and apply them well and the student can also make the right conclusions and can explain the conclusions that have been made. The student was also able to explain the reasons for the conclusions made appropriately.

Answer to Question Number 2

Formulate

Employ

Interpret

Known: there are 480 audience
           flannel class ticket 8.000
           silk class ticket 12.000
           ticket sales results in 5.060.000

Asked: how many flannel and silk class tickets sold

Formulate

Answer: x = flannel class   x + y = 480
           y = silk class   8000x + 12000y = 5.060.000

   x   +   y   = 480 | x 8000 | 8000x + 8000y = 3840000
8000x + 12000y = 5.060.000 | x 1 | 8000x + 12000y = 5060000 -
                                          - 4000y = - 1.220.000
                                      $y = \frac{-1.220.000}{-4000} = 305$

x + y = 480   y = 305
x + 305 = 480
   x = 480 – 305 = 175
   x = 175

so the number of flannel tickets sold is 175
so the number of silk tickets sold is 305

Employ

Interpret

Figure 6. Answer to Question Number 2 Research Subject A01

Based on the interview and the test result as presented in Figure 6, subject A01 has fulfilled the formulate indicator. The student can identify and use mathematical symbols in the problem then design the solution strategy and apply it appropriately. The student is also able to fulfill the employ indicator, namely, the student can identify and use mathematical symbols in the problem then design the solution strategy and apply it appropriately. The student was also able to fulfill the interpret indicator, namely making conclusions according to the context of the problem and being able to explain the reasons for the conclusions made appropriately.

Answer to Question Number 3

Known: the total amount of money of Nadira and Bella Rp 21.000
Asked: …?
Answer: x = Nadira's money
         y = Bella's money

$x + y = 21.000$ | x 2 | $2x + 2y = 42.000$
$4x - 2y = 6000$ | x 1 | $\underline{4x - 2y = 6.000 +}$
                          $6x = 48.000$
                          $x = \frac{48.000}{6} = 8000$

 $x + y = 21.000$
$8000 + y = 21.000$
 $y = 21.000 - 8.000 = 13.000$
Selisih = 13.000 – 8.000
so the difference between Bella's and Nadira's money is 5.000

Figure 7. Answer to Question Number 3 Research Subject A01

Based on the interview and the test result as shown in Figure 7, subject A01 has fulfilled the employ and interpret indicators by designing strategies and applying them well and the student can make the right conclusions and can explain the conclusions that have been made. The student is also able to explain the reasons for the conclusions made appropriately. However, the student has not fulfilled the formulate indicator, because based on the results of the interview the student was not careful in solving the problem and did not double-check the answers made because the processing time ran out.

Answer to Question Number 4

Known: Levi rides a motorbike at a speed of 60 km/h
         To cover the second distance 1 hour faster than the speed
         becomes 80 km/h
         Let the distance be x km, the needed time
Asked: a. two equations at x and y
         b. the distance between two places

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Answer: x = distance
        y = time
a.   at the speed of 60 km/h
     distance = speed x time
        x    = 60 x t
        x    = 60t → equation 1
     at the speed of 80 km/h
     distance = speed x time
        x    = 80 x t
        x    = 80t → equation 2
b.   from the two equations, substitute equation 1 for equation 2
     60t = 80t
```
Employ

Figure 8. Answer to Question Number 4 Research Subject A01

Based on the results of the interview and the test as illustrated in Figure 8, subject A01 has fulfilled the formulate indicator well. The student can identify mathematical aspects and translate them with appropriate mathematical symbols. However, the student has not been able to fulfill the employ and interpret indicators well. The student had difficulty in determining the second equation. The student felt problem number 4 was unfamiliar so it was difficult to solve.

Answer to Question Number 5

Based on the results of tests and interviews, subject A01 has fulfilled the formulated indicator well. The student can identify mathematical aspects and translate them with appropriate mathematical symbols. However, the student has not been able to fulfill the employ and interpret indicators well. The student did not solve the problem until the end because the time was up. The student came up with $p = 3 \times l$ as equation 1 yet he failed to substitute equation 1 into the formula of perimeter.

Kinesthetic Learning Style

Table 5 shows students' mathematical literacy in the topic of two-variable linear equation systems with kinesthetic learning styles.

Table 5. Mathematical Literacy Skills in Kinesthetic Learning Style

Subject	Question 1			Question 2			Question 3			Question 4			Question 5		
	F	E	I	F	E	I	F	E	I	F	E	I	F	E	I
K01	✓	✓	✓	✓	✓	✓	✓	(-)	(-)	✓	(-)	(-)	✓	(-)	(-)
K02	(-)	✓	✓	✓	✓	(-)	(-)	✓	(-)	(-)	(-)	(-)	✓	✓	(-)
K03	✓	(-)	(-)	✓	(-)	(-)	✓	(-)	(-)	✓	✓	✓	✓	(-)	(-)

Note: ✓ : fulfil   (-) : not fulfill

Based on Table 5, subject K01 with a kinesthetic learning style has a high cognitive level and has the best mathematical literacy ability among subjects with a kinesthetic learning style in solving SPLDV problems. This is proven when the subject can fulfill 3 indicators of mathematical literacy ability, namely formulate, employ, and interpret on questions 1, 2, and 3. The score obtained by the subject is 76. From the score obtained, it can be stated that subject K01 has a high category of literacy ability in solving SPLDV problems.

The following is the answer to one of the auditory learning style subjects in solving SPLDV problems.

Answer to Question Number 1

Based on the results of tests and interviews, subject K01 has fulfilled the formulate, employ, and interpret indicators by properly identifying and translating from the given problem, designing strategies, and applying them well. The strategy used by student K01 in solving problem 1 was similar to that of

V01 and A01 as presented in Figure 2. The student can make the right conclusions and can explain the conclusions that have been made. The student is also able to explain the reasons for the conclusions made appropriately.

Answer to Question Number 2

Based on the test and interview results, the strategy used by student K01 in solving problem 2 was similar to that of student A01 as presented in Figure 6. The student has fulfilled the formulate indicator. The student can identify and use mathematical symbols in the problem then design the solution strategy and apply it appropriately. The student is also able to fulfill the employ indicator, namely, the student can identify and use mathematical symbols in the problem then design the solution strategy and apply it appropriately. The student can also explain the steps used to solve the problem. The student is also able to fulfill the interpret indicator, namely making conclusions according to the context of the problem and being able to explain the reasons for the conclusions made appropriately. However, the student is not used to working on problems according to the steps.

Answer to Question Number 3

Known: the total amount of money of Nadira and Bella Rp 21.000
       If 4 times Nadia's money is subtracted by 2 times Bella's money is Rp 6000 — *Formulate*
Asked: What is the difference between Bella's and Nadira's money
x = Nadira's money
y = Bella's money

$x + y = 21.000$ |x 4| $4x + 4y = 84.000$
$4x + 2y = 6000$ |x 1| $\underline{4x + 2y = 6.000}$ -
               $2y = 78.000$
               $= \frac{78.000x}{2y}$

$x + y = 21.000$ $= 39.000$
$x + 39.000 = 21.000$
$x = 21.000 - 39.000$
$x = -18.000$
Selisih $= 39.000 - -18.000$
      $= 21.000$
so the difference between Bella's and Nadira's money is 21.000 — *Interpret*

Figure 9. Answer to Question Number 3 Research Subject K01

Based on the result of the interview and the test as described in Figure 9, subject K01 has fulfilled the formulate indicator well. The student can identify mathematical aspects and translate them with appropriate mathematical symbols. However, the student has not been able to fulfill the employ and interpret indicators well. According to the interview results, the student can explain the steps used in

solving the problem, but because the equation made by the student is not correct, the results are also not correct. The student had difficulty in making equations because the problem was not often found in learning. The teacher also did not use teaching aids in carrying out learning.

Answer to Question Number 4

Based on the results of tests and interviews, subject K01 fulfills the formulate indicator well because it is complete in writing the known questions. The student has not been able to fulfill the employ and interpret indicators well. The student had difficulty in determining the steps that must be used in solving the problem. The student came up with $x = 60t$ as equation 1 with x representing distance and t representing time yet he did not continue his answer. The student is not used to working on problems according to the steps because the teacher does not get used to working on problems according to the steps.

Answer to Question Number 5

Based on the test and interview results, the strategy used by student K01 in solving problem 5 was similar to that of V01 as presented in Figure 5. Student K01 has fulfilled the formulate indicator, namely, the student can identify and use mathematical symbols in the problem then design the solution strategy and apply it appropriately. The student is also able to fulfill the employ indicator, namely identifying and using mathematical symbols in the problem then designing the solution strategy and applying it appropriately. The student can explain the steps used to solve the problem. The student was also able to fulfill the interpret indicator, namely making conclusions according to the context of the problem and being able to explain the reasons for the conclusions made appropriately. This is in line with the interview conducted by the researcher that the subject can explain the steps used to solve the problem. However, the student is not used to working on problems according to the steps because the teacher does not get used to working on problems according to the steps.

Factors Influencing Students' Mathematic Literacy Skills

Based on the results of tests and interviews, students' mathematical literacy abilities are influenced by inhibiting factors, namely personal factors and instructional factors. Personal factors are factors regarding how students view mathematics learning regarding their confidence in their ability to learn. Students with high scores stated that they liked learning math and had good confidence in answering questions. Students with visual learning styles have characteristics, namely having difficulty in communicating directly through dialog (Fitria, 2023). This is in line with the results of the interview subject V02 had difficulty in conducting discussions and rarely asked the teacher which was caused by his lack of confidence in participating in learning. Another characteristic is needing to see something visually to gain understanding or knowledge (Pashler et al., 2008). The test questions given by researchers did not include pictures, so it became a factor in the lack of mathematical literacy skills in the visual learning style.

The characteristics of the auditory learning style are preferring to listen rather than read, not being thorough, and not being detailed (Pashler et al., 2008). Subject A02 was not careful in working on the problem and was also not careful in reading the problem so there was important information that was missed in writing known and asked. In addition, some other students still tried to solve the problems even though the answers given were not correct. However, some other students did not recheck the answers that had been obtained. Subjects K01, K02, and K03 also stated that they never checked the answers they had obtained. This is due to the characteristics of the kinesthetic learning style, which can be easily distracted in reading activities (Dewi & Hasanah, 2020). This is caused by the need to read the answers that have been obtained when checking them.

Instructional factors refer to the teaching methods used by the teacher. The instructional factor that affects mathematical literacy skills is that teachers often do not pay attention to students' learning styles in delivering lessons. They tend to only explain the material in front of the class, which is beneficial for students with auditory learning styles. However, students with visual learning styles need

illustrations of pictures or videos to understand the material well. Meanwhile, students with kinesthetic learning styles need hands-on practice or use props to optimize their understanding of the material.

Another factor causing the lack of mathematical literacy skills is that teachers rarely provide contextual and varied problems. Teachers should provide contextual and varied problems to help relate mathematical concepts to everyday life. The variety of problems helps accommodate the various learning styles of students so that each student can find a learning method that suits their learning style. In addition, varied problems allow students to develop broader and more flexible problem-solving skills that are essential in dealing with various mathematical challenges in everyday life and outside the classroom. In this study, teachers also did not accustom students to working on problems according to the steps. Familiarizing students to work on problems according to steps is important because it helps students develop a strong understanding of the basic concepts and processes involved in solving problems.

DISCUSSION

Subjects with visual learning styles are only able to fulfill the indicators of formulation. Even though in some cases they struggle with forming analogies which can lead to errors in concluding, visual learners are good at describing problems and can solve problems thoroughly (Ishartono et al., 2021). It might be because they struggle to keep up with the teacher's auditory-focused teaching style. The teacher does not provide enough image-based explanations and problems so they cannot optimize their learning style properly, especially in designing strategies and applying mathematical concepts to find solutions.

Students with kinesthetic learning styles can fulfill the mathematical literacy indicators of formulate, and employ, and some students can fulfill all indicators of mathematical literacy in some problems. Kinesthetic students often favor skipping directly to the final answer (Jaenudin et al., 2017). However, they can still describe the process they used to arrive at these answers, which are typically guided by intuition. The teacher only conveys material through explanations in front of the class, while the kinesthetic learning style requires props or direct practice to maximize the learning style. Kinesthetic students often struggle with sitting still and listening to lessons for extended periods (Ishartono et al., 2021).

Some studies (Ahyansyah, 2019; Amaliya & Fathurohman, 2022; Syawahid & Putrawangsa, 2017) claimed that the mathematics literacy skills of students with auditory learning styles are better than those of students with visual and kinesthetic learning styles. This is in line with the results found by this study, namely subject A01 obtained the highest score in solving SPLDV problems with a score of 82. Overall, students with auditory learning styles can fulfill the mathematical literacy indicators of formulate, and employ, and some students can fulfill all mathematical literacy indicators on several questions. As confirmed by Ishartono, et al (2021), auditory students are good at assessing or verifying the given argument.

The teacher tends to explain the material in front of the class conventionally, which is beneficial for students with auditory learning styles as they tend to understand mathematical concepts more effectively when taught through verbal explanations (Ishartono et al., 2021). Auditory students easier to digest, process, and convey things related to listening directly. They also tend to learn in this case receiving information by listening or verbally. Moreover, auditory students often discuss with friends and teachers if there are problems with their work so that they can complete the employment indicator well. Therefore, students with auditory learning styles have good mathematical literacy skills compared to visual and kinesthetic learning styles in solving SPLDV problems.

An important personal factor affecting students' mathematical literacy skills is students' confidence in their ability to learn. Students who lack confidence tend to be passive, less thorough, and feel embarrassed and reluctant to ask questions when experiencing difficulties in learning. This is in line with research conducted by Sabrina et al (2023) that students who are highly confident in answering tend to have good literacy skills as well, while students who lack confidence in learning mathematics tend to have low mathematical literacy skills.

According to Sabrina et al. (2023), in instructional factors, the importance of the influence of teaching methods on students' mathematical literacy skills. Even students with the same learning style can have different mathematics literacy skills due to their learning habits in the classroom (Masfufah & Afriansyah, 2022). The teacher's teaching method greatly influences the increase in students' mathematical literacy skills. If the teacher never utilizes teaching aids to help convey the material, this can make students feel bored with learning. Fun learning as well as familiarizing and allowing students to understand and work on contextual problems is an effective thing to do. In addition, giving assignments and using other learning resources (problems, books, the internet, and learning videos) can support the improvement of students' mathematical literacy skills which will affect the improvement of the quality of student learning (Sitopu et al., 2024). Facilitating group discussions and providing a platform for presenting the findings also can be helpful for students.

As an implication of this study, teachers are expected to be able to pay more attention to the learning styles of students so that they can determine the right learning method. In addition, teachers are expected to get used to giving and training students in working on mathematical problems related to mathematical literacy to help students in solving mathematical problems.

CONCLUSION

The learning styles of students in class VIII at SMP Negeri 1 Beber students who are classified as visual learning styles are 3 students (13%), the number of students classified as auditory learning styles is 10 students (43.5%), and the number of students classified as kinesthetic learning styles is 10 students (43.5%). Students with auditory learning styles are better at solving SPLDV problems than visual and kinesthetic learners. This is evidenced by some problems being able to fulfill 3 indicators of mathematical literacy and subject A01 obtained the highest score in solving SPLDV problems.

Personal factors affecting mathematical literacy skills in students with visual learning styles are having difficulty in conducting discussions and rarely asking teachers and friends. Moreover, during the class, the teacher does not visualize or add pictures to the problem. The teacher tends to explain the material in front of the class conventionally, which is beneficial for students with auditory learning styles as they tend to understand mathematical concepts more effectively when taught through verbal explanations. As for the auditory learning style, the students are not careful in reading the questions because the characteristics of students with auditory learning styles are that they prefer to listen rather than read. Meanwhile, the students with the kinesthetic learning style do not check the answers that have been obtained. While in instructional factors teachers often do not pay attention to students' learning styles and individual needs. In addition, teachers rarely provide contextual and varied problems. Contextual and varied problems are important because they help students develop a strong understanding and solve mathematics literacy problems systematically.

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