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ANALYSIS OF MATHEMATICAL LITERACY SKILLS OF SMPN 9 STUDENTS BASED ON LEARNING STYLE IN SOLVING PROBLEM

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ABSTRACT
This study aims to describe the mathematical literacy skills of students with visual, auditory, or kinesthetic learning styles. This research was conducted at SMP N 9 Kota Jambi in the eighth grade during the 2023/2024 academic year. The study employs a qualitative research design with a descriptive approach. The data for this research consists of the results of mathematical literacy tests, observations, and student interviews sourced from eighth-grade students at SMP Negeri 9 Kota Jambi. The technique used for selecting research subjects is purposive sampling. Data collection techniques include mathematical literacy tests, observations, and interviews with the research subjects. Data analysis techniques involve data reduction, data presentation, and conclusion. The results reveal that visual and auditory students can formulate situations mathematically, employ mathematical concepts, facts, and procedures, and interpret, apply, and evaluate mathematical outcomes. In contrast, kinesthetic students can only meet the indicator of formulating problems mathematically. Based on the research findings, it concluded that visual and auditory students possess mathematical literacy skills, whereas kinesthetic students do not meet the indicators of mathematical literacy skills.
Keywords*: mathematical literacy; learning styles; solution to problem*

ABSTRAK
Tujuan penelitian ini adalah untuk mendeskripsikan kemampuan literasi matematis siswa dengan gaya belajar visual, auditori, atau kinestetik. penelitian ini dilakukan di SMP N 9 Kota Jambi kelas VIII pada tahun ajaran 2023/2024. Penelitian ini menggunakan jenis penelitian kualitatif dengan pendekatan deskriptif, data penelitian ini berbentuk hasil tes kemampuan literasi matematis, hasil pengamatan dan hasil wawancara siswa yang sumber datanya didapatkan dari siswa kelas VIII SMP Negeri 9 Kota Jambi. Teknik pemilihan subjek penelitian yang digunakan ialah purposive sampling, teknik pengumpulan data dilakukan melalui tes kemampuan literasi matematis, pengamatan dan wawancara terhadap subjek penelitian kemudian teknik analisis data yang dipakai ialah dengan menggunakan reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian mengungkapkan bahwa siswa visual dan auditori mampu merumuskan masalah secara matematis, menggunakan fakta, konsep, dan prosedur penyelesaian secara matematis dan menafsirkan, menerapkan, dan mengevaluasi hasil matematis. Sementara siswa kinestetik hanya mampu memenuhi indikator merumuskan masalah secara matematis. Dari hasil penelitian yang dilakukan, disimpulkan bahwa siswa visual dan auditori memiliki kemampuan literasi matematis dan siswa kinestetik belum memenuhi indikator kemampuan literasi matematis.
Kata kunci*: gaya belajar; literasi matematika; pemecahan masalah*

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Introduction

Mathematics is one of the essential subjects whose existence is closely related to human life. In learning mathematics, students must possess several abilities. According to Maulyda (2020), there are five basic NCTM mathematical abilities, including mathematical problem-solving ability, mathematical reasoning ability, mathematical communication ability, mathematical connection ability, and mathematical representation ability. In addition, OECD (2023) said there are other mathematical abilities, namely mathematical literacy skills, one of the abilities that all students must possess. Mathematical literacy is the ability of a person to formulate, use, and interpret mathematics to solve problems in various real-world contexts. This follows the opinion of Elenna et al (2023) that mathematical literacy is the ability needed to understand information to be processed so that it can solve mathematical problems and make the right decisions. It is also supported by the opinion of Harefa et al (2023) that mathematical literacy is the ability to think mathematically, formulate, apply, interpret, and solve mathematical problems in a variety of different contexts. Problem-based learning can make it easier for students to learn the material so that it can help develop students' thinking skills (Vahlia & Agustina, 2016).

Everyone has different ways and habits of processing and obtaining information to solve mathematical problems. The way a person receives information is called a learning style (Rosidah et al., 2022). Learning style is a person's way of choosing how to do thinking activities, obtain, process, and understand information, and then remember it and successfully obtain new information (Ahmad, 2020). Learning styles are used at school to make it easier for students to understand lessons. Therefore, knowing each student's learning style is very important for teachers so that learning can go well and information can be conveyed (Rahmi & Samsudi, 2020). In absorbing information, each learning style has its way, in line with DePorter and Hernacki (2007), who state that human learning styles can divided into three major groups: visual, auditory, and kinesthetic. Visual learning styles have strength in the sense of sight, auditory learning styles are more dominant in hearing, and kinesthetic learning styles are dominant to the senses of taste and physicality (Nasution, 2022).

Knowing the learning style will help students in solving math problems. According to Nurizlan et al. (2022), math story problems are problems that are presented as short daily life problems in which each sentence needs to be translated into mathematical equations. The math story problems need to be translated into mathematical equations (Dwidarti, 2019). Meanwhile, according to Gunawan (2018), math story problems are problems presented in the form of stories in the form of a series of sentences related to actual circumstances in everyday life that contain problems and demand a solution. Giving math story problems has the aim of helping students practice thinking deductively (Wahyuddin, 2016). Students are expected to see the relationship and benefits of mathematics in everyday life so that they master mathematics and mature and solidify mathematical concepts. Understanding mathematics is very important because by understanding concepts, students will find it easy to solve various problems in different contexts (Hartini, 2022).

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Based on the results of observations made at SMPN 9 Jambi City, it was found that in formulating situations mathematically, some students can formulate them well. This is evidenced by the actions of these students, who understand what information is obtained from the problem and can write their statements in mathematical form. In addition, from field observations, it is known that students of SMP Negeri 9 Jambi City have different characteristics during the implementation of learning activities and when solving the given math problems. This can seen from student participation during learning and when students are asked to work on the given math problems. During learning activities, students found to pay attention to the teacher while teaching. Some students were silent, and some occasionally took notes while watching the teacher teach. Nevertheless, the teacher continued her teaching activities, assuming that all students learn the same way.

Based on this explanation, it found that each student has their way of learning activities and solving the math story problems given in processing information. From the observations that have been made, there are responses from several different students when working on math story problems. Knowing the type of learning style will make it easier for students to learn. This is in line with the explanation by Suci et al. (2020) that every human being born is always different physically and behaviorally. One thing we know is that every human being have their way of obtaining and processing the information they receive in various ways from one another; this includes mastering mathematical literacy skills. Knowing learning styles can enable students to maximize their mathematical literacy skills (Edimuslim, 2019).

A study conducted by Hidayah et al. (2020) showed that the mathematical literacy skills of visual learning style students had good literacy skills. These students can formulate problems into mathematical forms, apply mathematical concepts, facts, and procedures, and interpret and evaluate the results obtained. Another study conducted by Sulistyowati et al. (2021) on the mathematical literacy skills of students with kinesthetic learning styles shows that kinesthetic students have not fulfilled the indicators of mathematical literacy skills because they still make mistakes in calculations. This research is different from the research that has been done before. This study will describe the mathematical literacy skills of SMPN 9 Jambi City students with VAK learning styles in solving story problems.

This study uses comparison materials in accordance with the OECD (2022), which has limited the mathematical content that can be used as story problems to assess students' mathematical literacy skills. One of these contents is number content, which includes material about comparison. Comparison is one of the math materials where students are required to examine two or more objects that are compared to solve a problem. This research aims to describe the mathematical literacy skills of students with visual, auditory, or kinesthetic learning styles.

Research Methods

Students who conducted this activity are in classes VIII B and VIII D of SMP Negeri 9 Jambi City, with 48 students in the 2023/2024 school year. This study uses qualitative research with a descriptive approach to describe in detail and relate to students' mathematical literacy skills in terms of learning styles in solving

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math story problems. The data in this study is qualitative in the form of mathematical literacy test results, observation results, and student interview results. The data was obtained through tests, learning style questionnaires, and interviews. The data were then processed to get results that describe students' mathematical literacy skills in terms of visual, auditory, and kinesthetic learning styles. The data sources in this study were students of class VIII of SMP Negeri 9 Jambi City. Researchers will examine the field directly to collect information through observations, tests, and interviews with research subjects to obtain these data sources.

In this study, the research subject selection technique used a purposive technique. This technique is taking of research subjects that are in accordance with the research objectives characterized by the fulfillment of several criteria (Ahyar, 2020). The selection of research subjects was carried out according to the needs and objectives of this study using a learning style test in the form of a questionnaire. The learning style test will use the learning style results test adapted from the work of Chapman and Chisslet. The learning style test statement has no right or wrong and is divided into three groups of answers with 30 statements. Each student is required to choose one of the options by crossing the option according to their characteristics. After filling in, the calculation will carried out by accumulating each choice option according to what the student chose at the bottom of the learning style test sheet. The option with the highest result will indicate the student's learning style.

Students with the same number of options cannot be used as subjects because this study focuses on students with one learning style. Afterward, students with visual, auditory, and kinesthetic learning styles will selected as research subjects. Data collection techniques were conducted using mathematical literacy tests, learning style questionnaires, observations, and interviews with research subjects. The data was collected after being given a learning style test to identify students with visual, auditory, and kinesthetic learning styles first. After that, students with visual, auditory, and kinesthetic learning styles will given a mathematical literacy test. After that, the researcher made observations of the subject and conducted interviews to see further and confirm the results of the written test of students' mathematical literacy skills.

The learning style test used is a questionnaire that students of SMP Negeri 9 Jambi City will fill in. The test consists of 9 statements regarding visual, auditory, and kinesthetic learning styles. This learning style test is used to get students who will then be used as subjects for data collection related to their mathematical literacy skills. Students will present the mathematical literacy form of description questions. In working on these questions, students must answer in detail and in detail so that they can see each step of solving the description questions. This determines students' mathematical literacy skills by referring to the three indicators. The written test used in this study is a test question instrument in the form of math story problems with comparison material. The written test sheet contains two non-routine math story problems designed so that each indicator of mathematical literacy ability can assessed during the problem's completion. Both questions have adjusted to the indicators of mathematical literacy skills, including

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formulating situations mathematically, Employing mathematical concepts, facts, and procedures and Interpreting, applying, and evaluating mathematical outcomes.

Data analysis in this study uses qualitative analysis, which means that the analysis is carried out based on intensive, in-depth, ingenious, creative, sensitive, and conceptualized activities. Data analysis in this study uses analysis according to Miles and Huberman. The analysis will divided into three activities: data reduction, data presentation, and conclusion. Data reduction is part of data analysis that serves to sharpen, classify, direct, discard unnecessary, and organize data so that conclusions can be drawn at the end and verified. The conclusions in this study are based on the analysis of aspects of mathematical literacy skills based on student learning styles in solving math story problems. The conclusion will contain student behaviors influenced by their learning styles during the research. These factors influence students' mathematical literacy skills related to learning styles, their efforts in maximizing their mathematical literacy skills, and their mathematical literacy skills regarding VAK learning styles.

Result and Discussion

This research was conducted on March 18th-26th, 2024. The research location is SMP Negeri 9 Jambi City. The purpose of this study was to analyze students' mathematical literacy skills in terms of learning styles in solving mathematical story problems in Class VIII classes at SMP Negeri 9 Jambi City on comparison material. The research was conducted in class VIII B and VIII D SMP Negeri 9 Jambi City with 48 students. Researcher then determine students who can used as research subjects. The selected subjects are students who have a visual learning style, auditory learning style, and kinesthetic learning style. The subjects were selected after filling out the learning style test that had been given by the researcher previously.

The learning style test was given to students in classes VIII B and VIII D of SMP Negeri 9 Jambi City. It is used to determine each student's learning style. After filling in, all answers will be summed according to the answer code; if there is a similar number of choices, the student is categorized as having more than one learning style and cannot be used as a research subject.

Based on the results of the learning style test that was carried out, six students were selected, with two visual students, two auditory students, and 2 kinesthetic students from 48 students as research subjects. Furthermore, the students were coded SV1 for visual subject 1, SV2 for visual subject 2, SA1 for auditory subject 1, SA2 for auditory subject 2, SK1 for kinesthetic subject 1, and SK2 for kinesthetic subject 2. The following are the names of the students who became research subjects. The research subjects can be seen in Table 1.

Table 1. Research subjects

No	Student	Gaya Belajar	Kode
1	Student 1	Visual	S-V1
2	Student 2	Visual	S-V2
3	Student 3	Auditory	S-A1
4	Student 4	Auditory	S-A2
5	Student 5	Kinesthetic	S-K1
6	Student 6	Kinesthetic	S-K2

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The students selected as research subjects, as in Table 1, were then given a written test consisting of mathematical problems on comparison material. After the subject completes the math problem, the subject will conduct an interview to confirm the completion of the math problem.

S-V1

Formulating situations mathematically

Based on the answers the SV1 subject has written, the SV1 subject can identify mathematical elements based on mathematical problems presented in math story problems. Subject SV1 was able to identify the aspects he got from the problem. The elements are 20 workers completed in 30 days, a project that has been running for 10 days and stopped for 5 days. The SV1 subject was able to formulate problems from the math story problems given, seen with the subject SV1.

PSV : "What information do you get from the math story problem?"
SV1 : "Problem number 1 is that the building was completed with 20 workers for 30 days. Then, when it was running for 10 days, it stopped for 5 days."
PSV1 : "How is the relationship between the problem in the story problem and math?"
SV1 : "The initial workers were 20 for 30 days, then 15 days. We can find how many additional workers there are with the inverse value comparison formula."

In problem number 2, SV1 was able to identify problems from mathematical story problems regarding valued comparisons presented in tabular form. SV1 subject wrote down the information obtained from the table in sentence form. SV1 then wrote a question based on the story problem given. Based on the answers the SV1 subject has written, the SV1 subject can identify the mathematical aspects of the given story problem. In the question part, the SV1 subject wrote how much salad oil was needed for 150 ml of sauce. Thus, the SV1 subject formulated the mathematical problem of number 2 nicely. The SV1 subject first wrote down the mathematical formula regarding value comparison and wrote its relation to the story problem given by describing the answer.

Employing mathematical concepts, facts, and procedures

Using mathematical facts, concepts, and procedures, SV1 subjects can write down strategies and find mathematical solutions to solve the given math story problems. In problem number 1, the SV1 subject correctly wrote down the math facts. The SV1 subject was able to do multiplication and subtraction well. Subject SV1 used the inverse value comparison formula in solving the problem and understood that to get additional workers, it is known by subtracting between the number of workers obtained from the calculation using the formula and the original number of workers.

In solving the story problem regarding the inverse value comparison material at number 2, the SV1 subject wrote the formula and used math facts to solve the given problem. In the completion section, the SV1 subject wrote the solution strategy first. The SV1 subject first wrote down the value comparison formula for use, then substituted the numbers according to the information

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obtained from the problem. After that, the SV1 subject performed mathematical operations until the final result was obtained: the amount of salad oil for 150 ml of salad.

PSV1 : "What are the steps you used?"

SV1 : "I first write the known, asked, then do the problem. In problem number 1, I first determine the initial worker and the time, then enter the formula, and after getting the results, I can conclude. Problem number 2 is like number 1, it's just an ordinary comparison."

In the answers that the SV1 subject wrote in numbers 1 and 2 regarding value comparison, the SV1 subject seems to be able to know the mathematical facts of the given math story problem and also knows the procedure for solving it. This is seen from the results of the SV1 subject's answers and supported by the results of the interview.

Interpreting, applying, and evaluating mathematical outcomes

In interpreting mathematical results, the SV1 subject has been able to interpret the results he got into the context according to the problem given. In problem no 1, the SV1 subject got the final result of 20 workers, which then the SV1 subject interpreted according to the context requested. In question no 2, the SV1 subject also re-evaluated the answer he got. The SV1 subject seemed to make mistakes in problem identification, but this had been corrected before solving the given math story problem.

Subject SV1 evaluated problems 1 and 2 before they were collected. From the answer sheet, it can be seen that the SV1 subject made a mistake in question number 1, namely writing 600 as 6000. The SV1 subject realized the mistake and made improvements. Furthermore, the SV1 subject made an error in identifying problem number 2, but the SV1 subject also corrected his answer. During the interview, the SV1 subject felt confident that there were no more errors in his answers.

PSV1 : "Are there any mistakes after you do the recheck?"

SV1 : "There is no mistake"

PSV1 : "Does the result you get match what the math story problem asks?"

SV1 : "Yes, kak"

S-V2

Formulating situations mathematically

The SV2 subject, in identifying the problem, was seen first to write down the information obtained from the problem. SV2 subject in writing problem identification related to number 1, knew that the number of workers to complete the project was 20 workers, which would be completed in 30 days. In problem number 2, the SV2 subject identified the problem by writing down the information needed for the calculation only, namely the amount of sauce known from the problem, 120 ml, and the composition of the salad oil, 60 ml. Furthermore, the SV2 subject wrote the question, namely how many ml of salad oil is needed for 150 ml of sauce. Based on the interview results, the SV2 subject knew the information from reading the table provided in problem number 2. The SV2 subject could also restate the information and problems from the math story problem.

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PSV2 : “Do you know how to read the table in the problem? How do you do it?
SV2 : “60 ml salad oil, 30 ml vinegar, 30 m soy sauce”
PSV2 : “What information do you get from the math story problem.”
PSV2 : “a = 150, b =120, c = 60”

Employing mathematical concepts, facts, and procedures

In problem number 1, the SV2 subject can use mathematical facts well. The SV2 subject was able to complete the multiplication and division operations correctly even though there were previous errors. The SV2 subject understands the concepts and procedures for solving inverse comparisons well. In addition, SV2 also worked on the problem coherently. In problem number 2, the SV2 subject also used math facts. When the SV2 subject collected the results of his answer, the SV2 subject made a mistake in calculating the division operation. During the process, the researcher found the SV2 subject recalculating and found a calculation error. SV2 subject, after knowing the error, immediately made improvements to his answer.

The interview results show that the SV2 subject can explain the steps of his work according to the results listed on the answer sheet and believe that the results of his work are correct and follow the settlement procedure that should be followed.

PSV2 : “What are the steps you used?”
SV2 : "I first wrote down what I knew if there were 20 workers for 3 days and then walked 10 days and stopped 5 days. Then, I wrote the question about the additional workers, solved it with the comparison formula, and when I got it, I made the conclusion using my answer earlier. For number two, I first wrote down the size of the salad oil and sauce from the table, then I made a question and solved it using the formula. Then, I solved it. I crossed it first and then got the answer. I made the 'so.'"
PSV2 : "Are these steps by the solution procedure and using mathematical formulas?"
SV2 : “Already kak”

Interpreting, applying, and evaluating mathematical outcomes

In question number 1, the SV2 subject wrote about additional workers so that the SV2 subject knew the results he had obtained, namely 20 additional workers per required workplace. Furthermore, the SV2 subject concluded at the end of the answer by applying the results he had previously obtained so that he could answer the question that previously appeared in the question section. In problem number 2, Subject SV2 could interpret that the result he had obtained, namely 75 ml of salad oil, was the amount asked by the story problem given. The SV2 subject evaluated the results of his work on number 2 before the subject SV2 collected the results. When the SV2 subject did a recheck, the SV2 subject found an error in the calculation.

PSV2 : "Are the results you get by what is asked by the math story problem?"
SV2 : “Already kak”

S-A1

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Formulating situations mathematically

In identifying mathematical problems of comparison material, at number 1 with problems related to inverse value comparison, subject SA1 was able to identify the problem well. Subject SA1 formulated the problem mathematically, preceded by writing the inverse value comparison formula. Subject SA1 wrote down the formula to be used and then explained the description of the formula used based on the information provided from problem identification. In problem number 2, subject SA1 also identified the table given well.

PSA1 : "What information do you get from the math story problem?"
SA1 : "20 building project workers finished in 30 days, worked 10 days, and stopped 5 days. What is the number of workers that must be added? It is known that 60 ml of salad oil, 30 ml of vinegar, and 30 ml of soy sauce are needed to make 120 ml of sauce, while for 150 ml of sauce, how many ml of salad oil is required.

Employing mathematical concepts, facts, and procedures

In problem number 1, subject SA1 is able to use math facts well. These facts include math arithmetic operations. Subject SA1 knows how to operate math arithmetic operations. Subject SA1 performed multiplication, division, and subtraction operations correctly. In problem number 2, subject SA1 could use math facts well, although subject SA1 had mistakenly calculated the division result. However, subject SA1 realized the mistake and immediately corrected it. SA1 subject used the solution procedure coherently. Subject SA1 started by writing the formula for value comparison first.

Furthermore, subject SA1 was substituted, and multiplication calculations were performed. From the interview with subject SA1, the researcher discovered that subject SA1 remembered the comparison formula. When remembering the formula, subject SA1 utilizes practice problems and discusses them with classmates.

PSA1 : "How do you remember the formula?"
SA1 : "Practice with friends."
PSA1 : "Do you prefer discussion?"
SA1 : "Yes, kak."

Interpreting, applying, and evaluating mathematical outcomes

In problem number 1, subject SA1 interpreted the answer results from the calculation using the inverse value comparison formula, namely 40, as the workers needed to complete the project on time. In question number 2, subject SA1 can interpret the answer well. This can be seen from subject SA1, who initially made a calculation error, namely 9000 divided by 120, which is 90. However, subject SA1 realized and immediately corrected the mistake. From the interview results, subject SA1 also admitted that he made a mistake in problem number 2 and had made improvements.

PSA1 : "Is there an error after you do the recheck?"
SA1 : "Yes, kak."
PSA1 : "Did you make improvements when you found the mistake?"
SA1 : "Yes, kak"

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S-A2

Formulating situations mathematically

In formulating the problem mathematically, the SA2 subject identified the given problem well. SA2 subject started by completely writing the general formula of inverse value comparison. Then, write an explanation of each letter using the inverse value comparison formula. In problem number 2, subject SA2 identified the story problem given first. Subject SA2 knows there is 60 ml salad oil, 30 ml vinegar, and 30 ml soy sauce. In formulating the problem mathematically, subject SA2 has done it correctly. Subject SA2 knows that the formula used is the inverse value comparison formula.

PSA2 : "What information do you get from the math story problem?"

SA2 : "It is known that the initial workers were 20 building workers who finished up to 30 days, walked 10 days, and stopped 5 days. Asked how many workers should added. I know salad oil is 60 ml, vinegar is 30 ml, and soy sauce is 30 ml. I asked how many ml of salad oil Sania needed to make 150 ml of sauce."

Employing mathematical concepts, facts, and procedures

In the indicator of using mathematical facts, from number 1, subject SA2 can use mathematical facts well to solve the given mathematical story problems. In the indicator of using mathematical concepts, subject SA2 knows that the formula used to solve math story problem number 1 is the inverse value comparison formula. In problem number 2, subject SA2 uses mathematical facts well, as in number 1. However, subject SA2 did not perform multiplication calculations. Subject SA2 can use the concept of worth comparison well in the indicator of using mathematical concepts. Subject SA2 knows the formula for value comparison and knows how to use the formula to solve the given story problem.

PSA2 : "Can the math story problems be solved using mathematical formulas?"

SA2 : "Yes"

PSA2 : "What formulas can you use to solve these math story problems?"

SA2 : "The general formula a per c with b per d comparison formula with a 120 ml, b 60 ml, c 150 and d asked."

Interpreting, applying, and evaluating mathematical outcomes

Subject SA2 has interpreted and applied mathematical results correctly. Furthermore, subject SA2 applied the mathematical results to solve the given math story problem. SA2 subject wrote that it took 20 additional people to complete the project on time. Subject SA2 has evaluated the math results when solving the math story problems. This can seen when the researcher observes the SA2 subject's work. The SA2 subject is seen matching the answers listed on the answer paper with the results of calculations made on another paper by the SA2 subject. From the interview results, it is known that the SA2 subject has indeed evaluated the results of her answers.

PSA2 : "Have you evaluated the answers you wrote?"

SA2 : "Already"

PSA2 : "How do you evaluate math results using math tools?"

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SA2 : "I look again at all my answers while calculating and finding."

S-K1

Formulating situations mathematically

In problem number 1, subject SK1 can identify and formulate problems mathematically based on the mathematical story problems of the given comparison material. In the problem formulation section, subject SK1 strategizes first. Subject SK1 first wrote down the inverse value comparison formula, then subject SK1 substituted the numbers the subject got into the inverse value comparison formula on the following line. In problem number 2, related to mathematical story problems of worth comparison material, subject SK1 identified and formulated the problem well. Furthermore, subject SK1 wrote down the general formula for value comparison. Then, subject SK1 wrote down the information of the letters listed in the formula written by the subject: a is 60, b is 120, and c is 150. From the interview, it was also known that subject SK1 carried out reading activities to formulate the problem and determine what information to use.

PSK1 : "Do you know the problem in the math story problem?"
SK1 : "I know"
PSK1 : "Do you know how to read the table in the problem?"
SK1 : "I know too kak"
PSK1 : "What information do you get from the math story problem?"
SK1 : "Number 1 is known to be 20 workers equal to 30 days. The project runs 15 days, 10 plus 5. How many additional workers are needed is asked. Number 2 is salad oil, 60 vinegar, 30 soy sauce, 30 means all 120 ml of sauce. How many ml of salad oil?"

Employing mathematical concepts, facts, and procedures

In problem number 1, subject SK1 could not use math facts correctly. Subject SK1, when performing initial arithmetic operations in multiplication and division arithmetic operations, that have done it correctly but made mistakes in subtraction operations. In using mathematical concepts, subject SK1 could use inverse value comparison well. Subject SK1 knew that problem number 1 could solved by using the inverse value comparison formula, and subject SK1 wrote down the general formula for inverse value comparison as part of preparing the solution strategy. In the indicator of mathematical procedures, subject SK1 used procedures by the work on the story problem of inverse value comparison material story problem. In problem number 2, subject SK1 used mathematical facts. Subject SK1 could use the concept of comparison worth in part using mathematical concepts. Subject SK1 decided to use the ratio formula to solve problem number 2.

PSK1 : "Can the math story problem be solved using mathematical formulas?"
SK1 : "Yes, kak."
PSK1 : "What formulas can you use to solve the math story problem?"
SK1 : "The formula for comparing a per b equals c per d is equal, then a per d equals c per b for the inverse value."

Interpreting, applying, and evaluating mathematical outcomes

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In question number 1, as seen from the results of the answer, subject SK1 only interpreted the answers she got to the questions that had been formulated at the beginning. Subject SK1 did not apply the answers she had obtained to answer the question formulation made in the questioned section. During the interview, it was found that subject SK1 considered the answers listed on the answer sheet to represent the interpretation and application of the answers. Therefore, Subject SK1 only solved the math story problem until the calculation operation. Furthermore, subject SK1 interpreted the answer until the result was that 75 ml of salad oil was needed. However, subject SK1 did not apply the answer obtained so that it could answer the questions listed in the comparison problem given.

PSK1 : "How do you apply the answer you get to answer the comparison problem?"

SK1 : "We make the sentence similar to this" (referring to the story problem question)

S-K2

Formulating situations mathematically

Subject SK2, when identifying problems in problem number 1, did not write a complete identification of the given math story problem. Subject SK2 did not write down all the information during problem identification. Still, when mathematically formulating the problem, subject SK2 could formulate it entirely and correctly during the interview with subject SK2. Subject SK2 only mentioned the same information as was written in the answer, and no additional information was conveyed.

PSK2 : "What information do you get from the math story problem?"

SK2 : "20 workers for 30 days."

PSK2 : "What formulas can you use to solve the math story problem?"

SK2 : "By the way, a per b equals c per d while what we are looking for is d. d equals a times b per c."

Employing mathematical concepts, facts, and procedures

In problem number 1, subject SK2 can use math facts. Subject SK2 knows how to solve multiplication operations and division operations. Subject SK2 knew the inverse value comparison formula was needed to solve the math problem. After learning and understanding the problem, subject SK2 wrote down the value comparison formula, followed by a description of how to utilize the value comparison formula. In problem number 2, subject SK2 could use math facts. Subject SK2 knew that the value comparison formula had multiplication and division operations. During the interview, subject SK2 also said that subject SK2 knew the comparison formula from reading books and had learned it during elementary school.

PSK2 : "What formulas can you use to solve the math story problem?"

SK2 : "By the way, a per b equals c per d while what we are looking for is d. d is equal to a times b per c. Number 2 of this is a equals 120, b equals 60, and c equals 150. What we are looking for is the value of d. So, the method is to cross multiply 120 times d 60 times 150. So, the method is to cross multiply

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120 times d times 60 times 150. 120d = 9000. 9000 divided by 120 equals 75."

PSK2 : “Where did you get these formulas from?”
SK2 : "Read the book."

Interpreting, applying, and evaluating mathematical outcomes

In interpreting the mathematical results obtained from number 1, subject SK2 could interpret the results she got, even though the answer received by subject SK2 was wrong. Subject SK2 could not apply the results of her answer, so she could not answer the questions listed in the problem. Subject SK2 only looked for the number of additional workers without applying the answer to the context requested by the question. In the conclusion, subject SK2 wrote a sentence that was not related to the problem given. In interpreting problem number 2, related to value comparison, subject SK2 was able to interpret the answer correctly. In applying the answer, subject SK2 wrote a sentence that did not correlate with the question. The interview results found that the subject SK2 could not explain the application of the answer even though the answer had been obtained.

PSK2 : “How do you apply the answer you got to the math problem?”
SK2 : “I made the sentence because I had made the answer before.”

Visual students fulfill the first indicator of being able to formulate situations mathematically. Visual students have been able to identify problems from the story problems given and can formulate situations mathematically. According with Nabila et al (2023) which states that visual students can identify problems when answering problems and are able to explain the problems given. This is in same with the research of Yulianci & Nurjumiati (2020), which states that visual students can identify problems when answering problems and explain the problems given. Visual students also fulfill the second indicator, namely being able to employing mathematical concepts, facts, and procedures. Visual students can use the concepts they understand, use mathematical facts and tools, and solve the mathematical story problems given by the actual procedure. This result is in accordance with the opinion of Inastuti et al. (2021) that visual students read problems carefully and answer interview questions briefly. From this research, it is also found that visual students were able to interpret, apply, and evaluate mathematical outcomes. This finding is in line with the research of Hidayah et al. (2020) that visual students are able to interpret, apply, and evaluate mathematical outcomes.

Based on the research results, auditory students have mathematical literacy skills. Auditory students fulfill the first indicator, namely being able to formulate situations mathematically. Auditory students can identify mathematical problems in the form of information and problems that arise from the problem and can formulate problems mathematically. Furthermore, auditory subjects also fulfill the third indicator, namely being able to interpret, apply, and evaluate mathematical outcomes. This research accordance to Trisnaningtyas & Khotimah (2022) which states that auditory students fulfilled the indicators of mathematical literacy skills. Students do not just sit, pay attention, and accept what the teacher says, but students are more active in building their own understanding with the teacher acting only as a facilitator (Oktaviana & Vahlia, 2017).

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Kinesthetic students from the research findings can formulate situations mathematically. Kinesthetic students can identify problems and formulate them mathematically. From the results of the research, it was also found that kinesthetic students actively move their limbs while obtaining information. This is in accordance with the statement of Supit et al. (2023) that kinesthetic subjects actively move their limbs, such as moving to obtain information. Furthermore, neither kinesthetic subject fulfilled the indicators of employing mathematical concepts, facts, and procedures. Kinesthetic subjects make mistakes and are less careful, misusing mathematical facts and concepts. Kinesthetic subjects have also not been able to apply the mathematical results they have obtained to answer the problem of comparison problems. Both only work until the calculation operation is complete and do not do the interpretation of the answer results. Therefore, kinesthetic students have not fulfilled the third indicator, namely being able to interpret, apply, and evaluate mathematical outcomes. These results are in line with the findings of Trisnaningtyas & Khotimah (2022) that kinesthetic students are only able to formulate situations mathematically

Theoretically, this research describes the mathematical literacy skills of students with visual, auditory, and kinesthetic learning styles. This study also describes students' ability to answer mathematical stories on comparison material. So, this research has implications for teachers to design learning that suits students and become a review and information for doing more far-reaching research. Knowing the attachment of mathematical literacy skills and learning styles also can be used as a reference for developing mathematics learning by adjusting methods that are suitable for each student (Rismen, 2022).

Conclusion and Suggestion

The research found that students with visual and auditory learning styles have mathematical literacy skills because they meet the three indicators that have been determined. Students with kinesthetic learning styles have not fulfilled the indicators of employing mathematical concepts, facts, and procedures, as well as the indicators of interpreting, applying, and evaluating mathematical outcomes. For further research, this study can consider designing learning that can improve the mathematical literacy skills of students with visual, auditory, and kinesthetic learning styles.

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