

Analysis of Mathematical Literacy Behaviour of Junir High School Students

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Abstract

Literacy is not only an ability to read and write but also to interpret responses and understand, as well as an ability to do daily activities. Research previously studied ability literacy in aspects cognitive, whereas aspects are affective and psychomotor. The same importance is placed on an aspect of cognitive—the study of cognitive, affective and psychomotor behaviour. Therefore, this research aims to find out and measure the extent of mathematical literacy among students at one of the Cirebon Regency junior high schools. School This is taken with the purposive random sampling method. Study This uses instrument rubric behaviour literacy mathematics and tests literacy valid and reliable mathematics. The result shows literacy mathematical students dominated by level moderate (51.51%). Behaviour literacy mathematical students are differentiated into three categories, namely superior, regular, and inferior; presentation behaviour literacy mathematical student is 30% for inferior, 50% for regular, and 20% for superior. The writer recommends that the teacher give questions to students with a hook with Life a Day so that students can understand the questions given.

Keywords: Literacy, mathematical, behaviour

I. INTRODUCTION

Literacy can be defined as the ability to read and write, literacy, and proficiency in reading and writing (Lestari et al., 2021). Literacy is not just the ability to read and write; it can also be interpreted as response, understanding, and the ability to participate in daily activities (Chairunnisa, 2017). Mathematical literacy is considered as important as general literacy (Taskin & Tugrul, 2014). Therefore, the aim of learning mathematics in schools is not only to increase students' mathematical literacy but also to increase their ability to use and apply their knowledge in solving real-world problems or situations (Sumirattana et al., 2017). Therefore, there is the term Mathematical Literacy, where mathematical literacy can be defined as a person's ability to formulate, apply and interpret mathematics in various contexts, procedures and facts to describe and explain a phenomenon or event (Wardhani, 2011). According to (Krowka et al., 2017), good literacy skills will enable students to interpret questions correctly.

The Program for International Student Assessment (PISA) is one of the international student assessment programs, PISA organized by the OECD, which assesses the 15-year age group by measuring literacy skills in science, mathematics and mother tongue (Ada et al., 2021). In several literature studies, students' levels of mathematical literacy have been evaluated in several contexts, including state education policies, teacher training programs, and teaching methods. Indonesia itself ranks third lowest in mathematics literacy among all participants who took the PISA assessment (Stacey, 2011). It is clear that students' mathematical literacy in Indonesia, as seen through the PISA test, is still low (Rahmi et al., 2022).

(Kabael & Barak 2016) Stated that the importance of teaching mathematics is linked to everyday life in teaching and learning activities. (Khaerunisak et al., 2017) Also stated that mathematics education is realistic, where there needs to be a connection between mathematics learning and everyday life, which can be effective in increasing students' mathematical literacy. Another effort made by previous research was to improve the mathematical literacy skills of Indonesian students, which (Komang et al. et al., 2017) included efforts to implement a collaborative learning model to improve students' mathematical literacy skills. Applying the (Siregar et al., 2019) Problem Centered Learning (PCL) learning model to improve students' mathematical literacy abilities, where in this learning model, it was found that there was a change in students' mathematical literacy abilities for the better. However, there is a need to increase mathematical literacy skills among students in Indonesia.

While previous research tended to conduct research on literacy skills and cognitive aspects, there has been no research on aspects of student behaviour (Harisman et al., 2023a). The behavioural aspect of students is important because the affective aspect

is as important as the psychomotor and cognitive aspects. (Faizah, 2020). Behaviour in several studies consists of a combination of cognitive, psychomotor and affective (Gunawan et al., 2019; Rohati et al., 2022).

Because not much research has been done on students' mathematical literacy behaviour, it is necessary to do research on this. Therefore, this research aims to find out and measure the extent of mathematical literacy among students in Indonesia, especially at SMPN 1 Plumbon, by revealing through tests with cognitive, psychomotor and affective aspect scores. It will also reveal students' mathematical literacy and descriptions of their mathematical literacy behaviour (Harisman et al., 2023).

Literature Riview

1. *Mathematical Literacy*

According to PISA, mathematical literacy is defined as "An individual's capacity to formulate, use and interpret mathematics in various contexts. It includes mathematical reasoning and using mathematical concepts, procedures, facts, and tools to describe, explain and predict phenomena. It helps individuals to recognize the role of mathematics in the world and to make the judgments and decisions required of constructive, engaged, and reflective citizens" (OECD, 2019); the definition also states that mathematical literacy helps students recognize the role of mathematics in the world. It also states that students not only master basic mathematical topics but can master reasoning, concepts, facts, and mathematical tools to solve problems in everyday life. (Harisman et al., 2023a).

There are 7 indicators used by PISA in assessing mathematical literacy, namely communication, mathematization, representation, reasoning and argumentation, designing strategies in solving problems, using language and formal and technical symbolic operations, using mathematical tools. (OECD, 2013). Mathematical literacy in PISA is assessed using various formats, such as multiple choice and open questions. (Harisman et al., 2023a). This research also uses mathematics questions with open-ended questions, so it is hoped that it can elicit student behaviour in solving the questions given.

In this mathematical literacy, several previous researchers have analyzed the factors that influence students' mathematical literacy. (Andari & Ekawati, 2021) Conducted research to measure students' mathematical literacy in a cultural context, stating that Indonesian students in mathematical literacy using a cultural context had not yet reached levels 5 and 6 in mathematical literacy based on the PISA mathematical literacy level. On the other hand, (Kurniasari et al., 2023) conducted research to find out about mathematical literacy using information technology and found that using information technology in mathematics learning can increase students' mathematical literacy.

2. *Mathematical Behaviour*

Behaviour is any activity or action, both physical and mental, that leads to a change from a certain state to another, accompanied by encouragement to achieve success. (Rohati et al., 2023). It states that mathematical behaviour in students is all student activities to solve problems related to mathematical reasoning, either verbally or in writing, or physically or mentally, which leads to solving mathematical problems. According to (Maria et al., 2019), students' mathematical behaviour is the steps shown by students during the problem-solving process, starting from how to calculate to finding solutions to the problems they face.

Students' mathematical behavior has 3 aspects, namely cognitive, psychomotor and affective aspects (Rohati et al., 2022). Student cognitive refers more to knowledge during the learning process, the psychomotor domain forms a response given by students to the learning process, while affective takes the form of behavior or actions that are reflected by students (Utami et al., 2022).

(Rohati et al., 2022)Conducted research by developing a rubric for students' mathematical behaviour and categorizing mathematical behaviour into 3, namely: imitative, algorithmic, and creative. Apart from that, (Maria et al., 2019) conducted research on students' mathematical behaviour using problem-solving tests, which aim to categorize students' problem-solving behaviour, which can show 4 of the seven indicators of problem-solving behaviour, namely recording information, determining strategies, according to the context of the problem, and including results.

It can be concluded that students' mathematical behaviour is the activities or steps taken by students to solve a mathematical problem by calculating or other solutions, which are explained orally or in writing, or physically or mentally.

II. METHODS

An This research uses descriptive research with a qualitative approach, which aims to describe students' mathematical literacy behaviour. (Waruwu, 2023) states that qualitative research is a research technique that uses narratives or words to explain and describe the meaning of each phenomenon, symptom and particular social situation. Analysis carried out in study This is an analysis of behaviour literacy mathematical students using indicators of behaviour literacy mathematical students.

Participants

The research subjects in this study were three students at one of the Cirebon Regency Middle Schools. School This selected with used purposive sampling (Palinkas et al., 2019) and selected 9th grade for be the sample.

TABLE I. Student Mathematical Literacy Behaviour Rubric

Aspect	Indicator	Students' Mathematical Literacy Behavior Category		
		Inferior	Regular	Superior
Cognitive	<i>Communications.</i> Participants are educated and capable of presenting problem-solving processes and solutions.	Just capable of serving enough of 50% of problems, resolution processes, and solutions.	Able to present 50-90% of problems, resolution processes, and solutions.	Able to present problems, resolution processes, and solutions in a correct way (>90%)
	<i>Mathematizing.</i> Participants are educated and capable of changing real-world problems to inform mathematics.	Unable to convert real-world problems into mathematical form	Capable of changing real-world problems to in form mathematically; however, there is an error	Students are clearly able to transform real-world problems into mathematical form
	<i>Representation.</i> Students are able to represent problems, processes, and solutions in graphs, tables, diagrams, pictures, equations, or formulas.	Just capable of representing question data type and not capable of representing it in the form of statement mathematical other	Able to represent problems, resolution processes, and solutions in One another form	Able to represent problems, solving processes, and solutions in various forms
	<i>Reasoning and argument.</i> Participants are educated and capable of thinking logically about exploring and connecting problems for solutions.	Only able to describe the information contained in the problem	Able to connect problems to solutions using valid arguments, but errors exist	Able to connect problems to solutions using valid arguments
	<i>Devising strategies for solving problems.</i> Students are able to choose and use various strategies to solve problems.	Having the wrong strategy for solving the problem	Able to develop a strategy and answer questions correctly	Able to choose and use various strategies in solving problems
	Uses symbolic, formal and technical language and operations.	Error operations, symbols, and language (formal and technical) more than 50%	Language errors and symbolic, formal and technical operations are less than 50%	Able to use language and operations symbolic, formal and technical in a way appropriate
Meta-Literacy	Control	Metacognitive No looks orally and in writing	Metacognitive appear verbally	Metacognitive clarity in responding (written and verbal)
Psychomotor	<i>Using mathematical tools.</i>	Only able to use simple mathematical tools (Example: Calculator).	Able to use technological mathematical tools (Example: Geogebra).	Able to use and combine various mathematical tools



Affective	Belief	I am not sure about the arguments presented or the selected rule for the finishing problem.	Sure, with a number of arguments presented or selected rules No, we can reach a conclusion end solution.	Sure, with all arguments presented or selected rules, we can achieve a conclusion and end solution.
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Table 1 shows the assessment behaviour literacy of mathematical students in three categories, namely, inferior, regular, and superior. In research, this ability of literacy mathematical students is assessed from 4 aspects: 1. Aspect cognitive, 2. Meta-literacy aspect, 3. Aspect psychomotor, 4. Affective aspects (Harisman et al., 2023a) Subjects were given a mathematical literacy test to determine the cognitive aspects of mathematical literacy. After that, several students selected from each category were interviewed to examine meta-literacy and affective and psychomotor aspects. A total of 10 students were selected based on their mathematical literacy test: four students with high ability, three students with medium ability, and three students with low ability. At the end of the Interview, students' mathematical literacy behaviour was categorized using the student mathematical literacy behaviour rubric.

Instruments

The instruments used in this research were students' mathematical literacy tests and interview guides. Student mathematical literacy tests will show students' mathematical literacy behavior in cognitive aspects, and student interviews will show students' mathematical literacy behavior in meta-literacy, psychomotor and affective aspects. These cases and questions can be seen in Table 2.

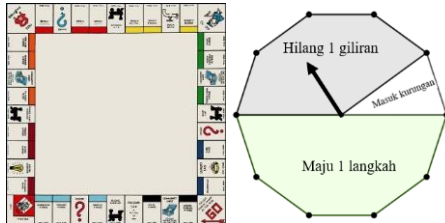
TABLE 2. Literacy Question Mathematical

Case	Question
While playing in the park, Mr Eko saw children playing with several rabbits. When Pak Eko tried to count it, it turned out there were 30 legs and 11 heads.	1. How many children are there, and how many rabbits?
Deni has a flash disk with a capacity of 2 G.B. (1894 MB), which is used to store games, photos and music. Deni's flash disk storage status is now shown in the pie chart below.	2. If the contents of the flash disk are  And Deni only wants to delete a maximum of 2 folders. Can Deni load the game? Show me your calculations!
Deni wants to move the game file "GTA San Andreas", which is 1425 MB in size. When moving files, Deni received a notification that there was not enough storage and had to delete several folders.	3. Present the contents/status of Deni's flash disk after inserting the game files in the form of a table and pie chart!
	4. What information can be used to find the height of a lighthouse above sea level? 5. Write down the mathematical form of the information you got from Joko's findings! 6. How high is the lighthouse lamp from the ground floor? 7. How high is the lighthouse above sea level?

Joko is the smartest math student in his city. When he saw the city lighthouse, he was curious to use his abilities to find out how high the lighthouse was above sea level. Joko's investigation began and obtained several pieces of information, namely:

- The lighthouse has 234 steps that are the same distance apart,
- The stairs at the lighthouse are used to get to the top floor, where the lighthouse light is located.
- The difference in height of each step is 10 cm,
- The ground floor of the lighthouse is 3.21 meters above sea level.

When Joko wanted to continue his investigation, Joko caught a high fever. Help Joko complete his investigation by answering the following questions!



Andi, Budi, and Candra want to play Monopoly by using a ten-sided lottery instead of dice. In this lottery, there are three possibilities that can be obtained, namely:

- "Entering the cage" means the player will enter the cage in the lower left corner of the monopoly board and lose three turns.
- "Lost one turn" means the player does not get the next turn.
- "Go 1 step forward" means the player moves his pawn 1 square forward.

The game will end when one of the player's pieces returns to the start box (bottom right corner).

- If Andi always gets "Go 1 step forward," what turn will Andi finish the game?
- If Andi finishes the game by always getting "Go 1 step forward" and Budi is only 18 squares ahead of the start, how many times will Budi get "Entered cage" or "Lost one turn"?
- If one player wants to finish the game the quickest way, what possibilities does he have to get each turn?
- If Candra spins the lottery 40 times, how many times is Candra likely to get "Go to prison"?

Table 2 shows that the instrument used in this research is a valid and reliable mathematical literacy test. The mathematical literacy test contains 4 cases, and in each case, it consists of 1 – 4 questions. The total number of questions on the test literacy mathematical This is 11 questions. From the results of this mathematical literacy test, students' answers are analyzed and categorized to take samples for interviews.

Data Collection and Analysis

After carrying out a student mathematical literacy test, the results of the student's answers are analyzed and identified according to their categories.

TABLE 3. Students' Mathematical Literacy Behaviour Categories

Category	Scale
Tall	Average Total Score + Standard Deviation \geq
Currently	Average - Standard Deviation \geq Total Score > Mean + Standard Deviation
Low	Total Score < Mean - Standard Deviation

Table 3 shows the categorization of students' mathematical literacy according to (Harisman et al., 2023) the calculation scale for each category by determining the total score, average, and standard deviation. The assessment score for every Question is 0-9 points. The student's total points are used to determine the student's category.

TABLE 4. Students' Mathematical Literacy Behaviour Categories

Category	Scale
Tall	Average ≥ 6.5
Currently	$3.5 \leq \text{Average} < 6.5$
Low	Average < 3.5

Table 4 shows the categories of students' mathematical literacy. Students' mathematical literacy behaviour is obtained from each assessment indicator based on a rubric: the superior category gets 7-9 points, the regular category gets 4-6 points, and the inferior category gets 0-3 points. These mathematical literacy behaviour points will be categorized based on the average Score. The categorization will be based on Table 4.

III. RESULTS AND DISCUSSION

The mathematics literacy test shows an average student result of 20.90 and a standard deviation of 10.05. The categorization is determined based on the average Score and standard deviation. Students' mathematical literacy categories are presented in Table 5.

TABLE 5. Categories of Students' Mathematical Literacy Behavior

Category	Scale
Superior	Average ≥ 30.96
Regular	$10.84 \leq \text{Average} < 30.96$
Inferior	Average < 10.84

Table 5 shows that these categories are on a very low scale, namely 30.96, while the maximum Score obtained by students on the test is 36. This phenomenon occurs because of poor test results, where many students get a score of less than 10. And some students do not answer a single question. The results of the cognitive aspect of the mathematical literacy test, categorization and selection of sources are summarized in Table 6.

TABLE 6. Mathematical Literacy Test Results, Categorization and Determination of Sources

Participants	Mathematical Literacy Test Classification Results		Subject Behavior Literacy Mathematics Student (Interview)
33	High	8	Subjek 1
			Subjek 2
			Subjek 3
			Subjek 4
	Medium	17	Subjek 5
			Subjek 6
			Subjek 7
			Subjek 8
	Low	8	Subjek 9
			Subjek 10

Table 6 shows the results of the test from 33 students; there are eight students who have literacy mathematics low, 17 students who have literacy mathematics medium, and eight students who have literacy mathematics tall. These results indicate that students' mathematical literacy in one of the Cirebon Regency Middle Schools is good. However, there are also many students who get high categories because of the low level of the categorization scale. If the categorization is based on percentage, then 25 students are below 50% of the maximum Score, and only eight students are above 75% of the maximum Score. On the other hand, based on Table 6, 10 students are selected to be interviewed, and their mathematical literacy behaviour will be assessed. Behavioural outcomes of literacy mathematics students can seen in Table 7.

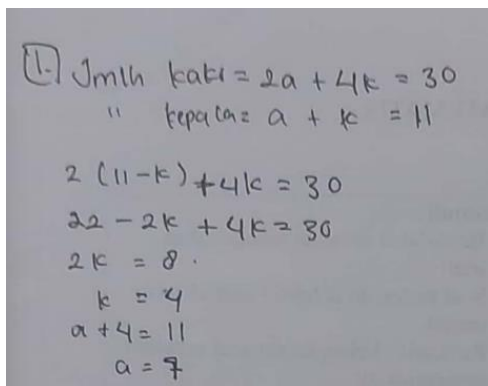
TABLE 8. Behavioral Outcomes Literacy Mathematical Student

Inferior	Regular	Superior
Subjek 8	Subjek 6	Subjek 1
Subjek 9	Subjek 2	Subjek 4
Subjek 10	Subjek 7	
	Subjek 3	
	Subjek 5	
30%	50%	20%

Table 7 shows the number of students in each category and that some students have moved out of their categories in mathematical literacy. This is because many students need help to convey their answers during interviews, and some students only guess the answers, causing their behavior scores to decrease, especially in communication, argumentation, and confidence. Apart from that, the move was also caused by different mathematical literacy tests and behavior. Examples of students in each category can be seen as a representation. The representative of students at the superior level is subjek 1, the representative of students at the regular level is subjek 3, and the representative of students at the inferior level is subjek 8. Each student's behaviour on each indicator will be explained.

1. Subjek 1

S1 represents students with a level behavioral literacy and superior mathematics Because only it's him capable of students finishing Lots of questions and obtaining the highest value . The answer to the question number 1 is shown in Figure 1.



Translate :		
1	Amount feet	$= 2a + 4k = 30$
	Amount head	$= a + k = 11$
	$2(11 - k)$	$+ 4k = 30$
	$22 - 2k$	$+ 4k = 30$
	$2k = 8$	
	$k = 4$	
	$a + 4 = 11$	
	$a = 7$	

Figure 1. S1 answer to Question Number 1

Picture 1 shows question number 1; S1 explains, starting to write known information moreover first and then write form in Question as well as continue write a number of equality For number of legs = $2a + 4k = 30$ and heads = $a + k = 11$, then finish with method mathematics use equality and focus melt the value of k results in $k = 4$ then with equality amount head enter k value into it and obtain results from $4 - 11 = 7$ so that $a = 7$. Then, he answers the results for the child and rabbit, getting the total as child 14 and the rabbit as 16, totalling 30.

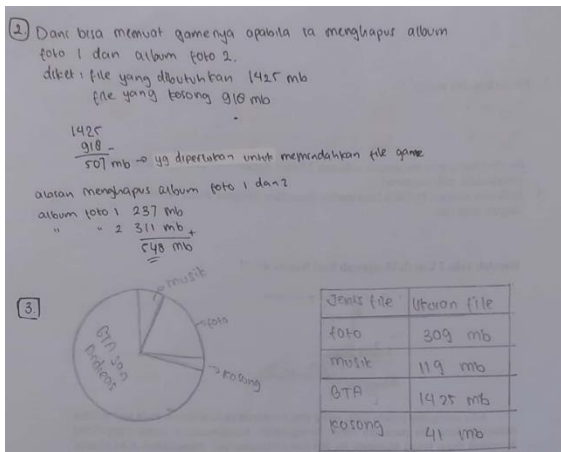


Figure 2. S1 Answer to Questions Number 2 & 3

Translate:

2. Dani can load if he deletes photo album 1 and photo album 2.

Known: the file required is 1425 MB

The empty file is 918 MB

1425

918

507 MB required to move game files

Reasons for deleting photo albums 1 and 2

Photo album 1 237 MB

Photo album 2 311 MB

548 MB

+

Figure 2 shows number 2 has two possibilities possible answers chosen students, namely "Photo Album 1" - "Photo Album 2" and "Photo Album 2" - "Photo Album 4". S1 chose "Photo Album 1" and "Photo Album 2" because He see choice the as answer with fast and not see "Photo Album 2" - "Photo Album 4". S1 answer to the question numbers 2 and 3 are presented in Figure 2. In his Interview, he says that matters happened Because of his carelessness. Meanwhile, S1 got it to represent data in a way that was complete based on answering question number 2 to answering question number 3. He can represent the answer in the form of tables and pie charts. Apart from that, he can also use the words "Photo", "Music", "Game" and "Capacity" in the diagram.

Interviewer 1: " How about question number 2?"

S1: "For number 2, I took references from photo album one and photo 2. Because I only found it in photo album one and photo album 2, the way to do it is to find out the known information first. In the Question, it is stated that the size of What is needed for the GTA SA game is 1425 MB, while the available capacity is only 918 MB. The Question is whether Deni can load the game. For that, we need to subtract 1425 MB from 918 MB, so the shortage is 507 MB for photo 1 and photo album 2, and from adding up the empty files in both albums, I found that there was 548 MB of free space."

Interviewer 2: " How about question number 3?"

S1: "Because of the problem number 3 is related with question number 2, the answer only can estimated based on existing information."

In completing it, Aisy counted moreover formerly amount memory required For move game files i.e. 1425 mb – 918 mb = 507 mb then count number of files required that is with delete album 1 and album 2 so that the total deleted is 237 mb + 311 mb = 548 mb. Then then he create diagrams and tables.

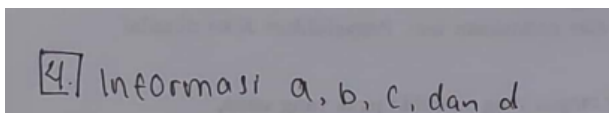


Figure 3. S1 Answer to Question Number 4

Translate:

Informaton a,b,c dan d

In figure 3 shows question no. 4 S1 only answer information with a, b, c, and d only . Because in the answers on paper and explain in accordance information read in the question number 4.

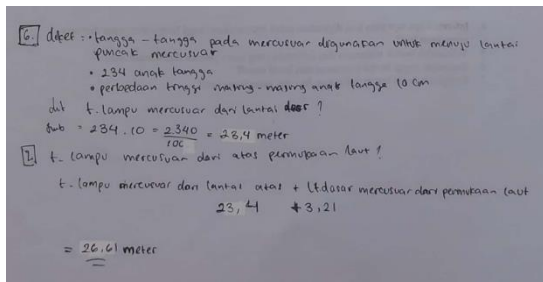


Figure 4. S1 answer to Questions Number 6 & 7

6. Known:
 - The stairs at the lighthouse are used to get to the top floor at the lighthouse
 - 234 steps
 - The difference in the height of each step is 10 cm
 Asked: how high is the lighthouse from the ground floor?
 Answer: $234 \cdot 10 = 2,340/100 = 2,34$ meters

7. Hoe high is the lighthouse above sea level?
 Height of the lighthouse from the ground floor + height of lighthouse from sea level $23.4 + 3.21 = 26.61$ meters.

Figure 4 shows. For questions 6 and 7, S1 explained that He writes known information moreover first and writes it down from questions asked and on each question number 6. and also for answer question number 7 ia see the answer to the question number 6 for answer question question number 7.

Based on S1 answer, it is concluded that cognitive level is categorized by a number of points. The first is the level of regular communication Because the answer served with Enough Good . In line with research(Rahmah et al., 2022) that communication is the most important part in the learning process to achieve goals so that clear information is conveyed and ideas are conveyed, this shows that S1 needs to increase clarity in delivering her answers.

The second is a superior level of mathematization because ideas using mathematics can answer questions and solve contextual problems. In research(Kusnadi et al., 2021) Students' mathematical understanding abilities support success in learning and solving problems, which means S1 needs to be more organized in her approach to achieve better results.

The third is a superior level of representation because it can use tables, pie charts and mathematical models. Research by (Suningsih Istiani, 2021)supports these findings by stating that good representation can make students explain various things in solving mathematics problems clearly so that students find it easier to convey answers. The fourth is a superior level of reasoning and argumentation because the reasons and arguments in the Interview can be understood clearly.

The fifth is a superior level in designing strategies to solve problems because he is very good at formulating ideas and strategies to solve problems. Sixth is the regular use of language and symbolic, formal and technical operations because the answer can be understood, but the use of these operations alone is not enough. Based on (Hemalya et al., 2023)that problem-solving ability is something that must be achieved in learning mathematics because it is a form of solution in learning everyday life.

Seventh, S1 mastery is at a superior level in the cognitive aspect. When he gets a wrong answer and gets stimulated, he can correct his answer to be the correct answer by checking the same formula or reviewing it again by asking a friend. According to research by (Purwanti et al., 2016), "the ability to revise answers based on feedback indicates a high metacognitive level" Eighth, the psychomotor and affective aspects are included in the superior category. He can use laptop applications to learn mathematics or solve problems, but he can only use a few simple tools.

1. Subjek 3

S3 is a representative student with a level of behavior literacy and mathematics regular. The answer to the question number 1 is presented in Figure 5.

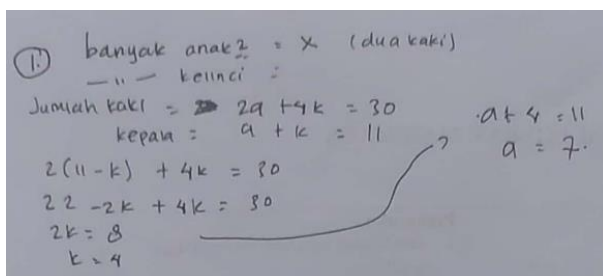


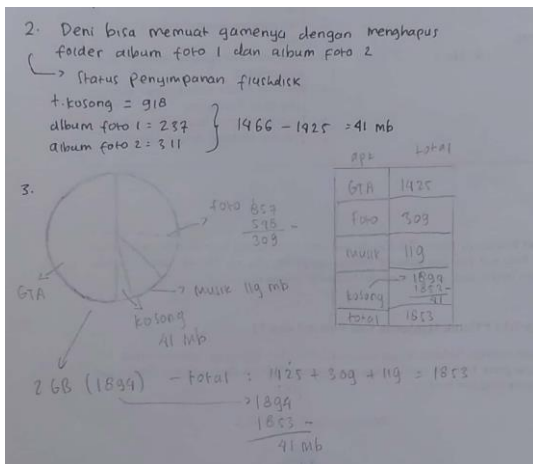
Figure 5. Answer S3 on Question Number 1

Translate:
 1. Number of children = x (two feet)
 Lots of rabbits =
 Number of legs = $2a + 4k = 30$
 Number of heads = $a + k = 11$
 $2(11 - k) + 4k = 30$
 $22 - 2k + 4k = 30$
 $2k = 8$
 $k = 4$
 $a + 4 = 11$
 $a = 7$

Figure 2 shows question no. 1 Marisha in answering the Question admitted he was doubtful because do together with Friend his friend He thought that follow the process in understand with method listening . Therefore, he just wrote along and wrote the answer accordingly.

Interviewer 1: "OK, for Question Firstly, Marisha, how is it the way you finish the given problem? How did you finish question number 1?"

S3 : " To question First This is me feel doubtful because I discuss with friends , so I do not understand enough. Where does it come from? The answer . This matter make I A little Confused ."



Translate:

Deni can load game by deleting the photo album 1 and photo album 2 folders.
 Flashdisk storage status.
 Blank = 918
 Photo album 1 = 237
 Photo album 2 = 311
 1466 +
 • $1466 - 1425 = 41 \text{ MB}$

Figure 6. Answer S3 on Questions Numbers 2 and 3

In image number 6, which shows problem number 2, S3 explains how to solve it. To download the GTA application, you need to delete the empty folders from photo album 1 and photo 2. 918 are needed, while photo album 1 = 237 mb and photo album 2 = 311 mb so that is $1466 - 1475 = 41 \text{ mb}$ remaining. For question number 3, S3 only answered the Question by guessing so she didn't calculate accurately for the table and diagram maker.

Interviewer 1 : "OK, for question number 2, how is it method finished it ?"

S3 : "To download the GTA application, Deni needs to delete the folders from photo album one and photo 2. The free space required is 918 MB, while photo album 1 is 237 MB and photo album 2 is 311 MB, so the total is 1466 MB. After deleting the remaining 41 M.B."

Interviewer 1: " How about question number 3?"

S3 : " For diagrams, me No count in a way accurate , just guess . Whereas For table , i do it like This ."

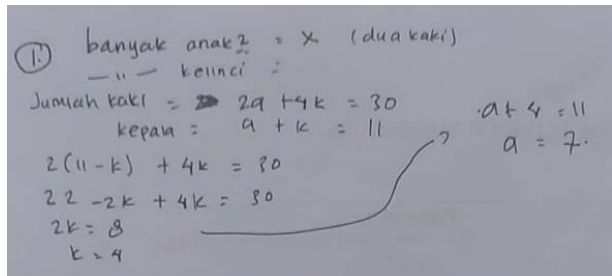


Figure 7. Answer S3 on Problem Number 4, 5 and 7

Terjemahan :

4. a. It has 234 steps with equal distance
 b. Strairs used to get to the top (light)
 c. The difference in tthe height of each ladder is 10 cm
 d. Ground floor off the lighthouse 3.21 meters above sea level
 5. Stairs: 234
 Step height: 10 cm
 Base area 3.21 meters above sea level

Figure 7 shows that in case 3, Marisha is working on question number 4 with the information and writing it down back on the sheet paper, as well as explaining return-related information. What can you get? Moment interview. On matter number 5, S3 only answered the Question by seeing and returning the numbers in the Question. Then, he added them up because he felt confused when answering questions about his work on the problem. Then, on to the Question, his number 7 is the only written answer. Finally, Of course, this can be seen in the interview excerpt as follows:

Interviewer 1: " Are you doing it? Question number 4?"

S3: "Yes, I am doing question number 4."

Interviewer 1: "OK, how about it? How do you do it ?"

S3 : "I see this from the text in the Question. "

Interviewer 1: "OK, what was asked in question the ?"

S3 : "What was asked is information. What only one can use For find a tall light lighthouse above surface sea . Well, inside the text Already explained a number of information , so That Can used For find tall light lighthouse ."

Interviewer 1: "OK, how about it with question number 5?"

S3 : "Yes, for question This, I am rather Confused Because the answer is rather origin ."

Interviewer 2: "OK, how about it? How do you do it?"

S3 : "I just take notes on existing information, then add up the numbers ."

Interviewer 1: " Meaning, how? With question number 7?"

S3 : " To question, this is not enough for me to know because I forgot."

Interviewer 1: "But why does the answer Have to be 26?"

S3 : "If I'm not mistaken, the answer is That obtained with add up or multiply numbers Because time That I do it with in a hurry ."

Based on S3 answer, it is concluded that cognitive level is categorized by a number of points. First, level the communication regularly Because the answer No served in a way complete and comprehensive. According to(Rahmah et al., 2022), communication is the most important part of the learning process to achieve goals so that clear information is conveyed and ideas are conveyed; this shows that S3 needs to increase clarity in delivering her answers.

Second, he has a fairly regular level of mathematization because he can solve some questions, still miss some questions, and answer questions carelessly. In research(Kusnadi et al., 2021) Students' mathematical understanding abilities support success in learning and solving problems, which means S3 needs to be more organized in her approach to achieve better results.

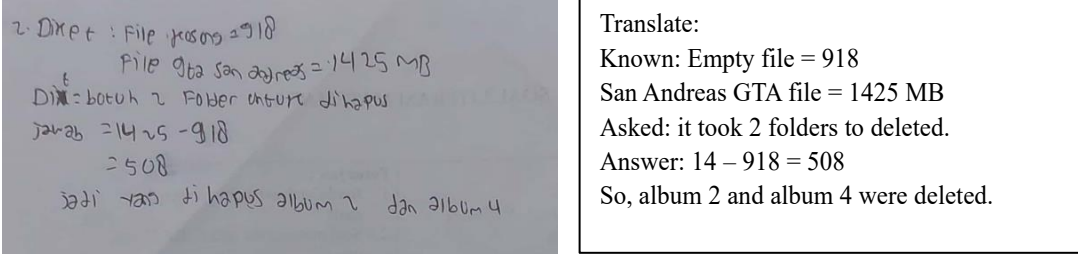
Third, it has a superior level of representation because it can use tables and pie charts to depict them. Marisha's representation skills are good. According to(Suningsih & Istiani, 2021) that good representation can make students explain various things in solving mathematics problems clearly so that it is easier for students to convey answers. Fourth, he has a sufficient level of reasoning and argumentation because his reasons and arguments during the Interview can be understood clearly.

Fifth, he has a level of regularity in designing strategies to solve problems because he organizes ideas to solve problems very well, but there are still some mistakes. Sixth, he has a level of regularity in using symbolic, formal and technical language and operations because his answers are understandable. However, the use of language and its operation are poorly understood.

Seventh, S3 mastery is at a regular level in the meta-literacy aspect. When she gets a wrong answer, she needs stimulation to get ideas from her friends. S3 never and cannot use the app and only uses a simple process. Lastly, S3 lacked confidence in her answers, arguments and intonation. Therefore, his affectivity is considered to be at a regular level.

2. Subjek 9

S9 is a representative student with a level of behaviour literacy and inferior mathematics. He can only answer three questions, which is number 2. Answer number 2 is presented in Figure 8.



The figure shows a handwritten student answer on the left and its English translation in a box on the right. The handwritten text reads: '2. Diket: File kosong = 918', 'File GTA San Andreas = 1425 MB', 'Dit: butuh 2 folder untuk dihapus', 'jawab = 1425 - 918 = 508', and 'jadi van di hapus album 2 dan album 4'. The translation box contains: 'Translate: Known: Empty file = 918', 'San Andreas GTA file = 1425 MB', 'Asked: it took 2 folders to deleted.', 'Answer: 14 - 918 = 508', and 'So, album 2 and album 4 were deleted.'

Figure 8. Answer S9 on Question Number 2

Figure 8 shows the answer S9 on the matter number 2 answered with Correct . He explains in the form of summarized information regarding what is known and asked. Then he answered that the file needed first was 508 MB so he concluded that he deleted album 2 and album 4.

Interviewer : " At number two too. OK, ready yeah? For First Question, how? method You finish given problem ? For question number two, how method solve it ? "

S9 : "I did it with a friend."

Interviewer: "You did it with a friend. Can you explain the answer?"

S9 : "Can."

Interviewer: " Please, how about it? The method ?"

S9 : "It is known that file size is 0-918 MB."

Interviewer: "The GTA San Andreas file is 1425 MB in size."

S9 : " The Question is is need delete two folders. So, we deleted the GTA San Andreas files. The GTA San Andreas file is 918 MB in size, so 508 MB remaining."

Interviewer: "And then?"

S9 : "So, albums two and four should be deleted from that folder."

Then he answered that the files needed first were 508 MB, so he concluded that he deleted album 2 and album 4.

Based on S9 answer, it can be concluded that his cognitive level is categorized into several points. First, he has a regular level of communication because he can understand the problem. Second, he has a regular level of mathematics because he cannot use mathematics to solve a problem.

Third, it has a low level of representativeness because it is unable to represent data in other forms. "In research (Suningsih & Istiani, 2021) "representation can help describe, explain or expand mathematical ideas which include symbols, equations, words, photos, tables, graphs, manipulative objects and internal techniques for thinking about mathematical ideas."

Fourth, he has a regular level of reasoning and argumentation because he can answer the reasons for his ability to answer that much. Fifth, he has a low level of skill in designing strategies to solve a problem because he lacks the ability to construct ideas to solve a problem. Sixth, he has a regular level of use of symbolic, formal, and technical language and operations because he lacks in the use of symbols.

Seventh, mastery of S9 in aspects of meta literacy is at a regular level. (Sufirman et al., 2022) suggests that "meta literacy is the ability to access, assess, and use information critically." When the interviewer gave him the stimulus, he was unable to continue. This indicates a lack of ability to apply knowledge in new situations, as explained by (Purwanti et al., 2016), which states that "the ability to respond to stimuli in an adaptive way is a sign of good metacognitive thinking."

Eleventh, he has a low psychomotor level because he can only use smartphone applications such as Google. Lastly, he has a regular affective level because he answers questions with one Question but as best he can and confidently.

Behavioral details literacy mathematics Subjek 1, Subjek 3, and Subjek 9 can seen in Table 8.

TABLE 8. Behaviour Literacy Mathematics Subjek 1, Subjek 3, and Subjek 9.

No.	Name	Cognitive						Meta Literacy	Psychomotor	Affective	Conclusion
		1	2	3	4	5	6	7	8	9	
I.	Subjek 1	S	S	S	R	S	S	S	R	S	S
II.	Subjek 3	S	R	R	S	R	R	R	R	I	R
III.	Subjek 9	R	R	I	S	R	I	R	I	R	I

In Table 8, the research results show that students in one of the Cirebon Regency Middle Schools are in class 9A have a moderate level of mathematical literacy and sufficient mathematical literacy behaviour. These mathematical literacy results are in line with the PISA results, which state that Indonesian students' scores range from 360 to 391, which is half of the highest Score of 800 points. The PISA results are illustrated as follows in Figure 12:



Figure 9. PISA Results (Program for International Student Assessment & Organization for Economic Co-Operation and Development, 2022)

Figure 9 shows Indonesia's low PISA results. In this case, the researchers conducted a study on the mathematical literacy abilities of Indonesian students. (Harisman et al., 2023) The mathematical literacy level of students in Indonesia was moderate, and their mathematical literacy behavior was low. (Wijaya, 2016) found that students needed help to achieve the three components of information literacy: recognizing the information needed, finding and evaluating the quality of information, and creating information effectively. This shows that students' information literacy still needs to improve. (Masfufah & Afriansyah, 2021) Students' mathematical literacy skills could have improved due to difficulties working on PISA questions at levels 1 and 2.

The finding that Indonesian students have a regular level of mathematical literacy behavior is new. The results of these findings can be used as a guide for researchers to improve the mathematical literacy behavior of students in Indonesia. Researchers can develop learning methods, tools, media, or even models.

IV. CONCLUSION

The results of this research show that the assessment of the literacy level of students at SMP Negeri 1 Plumbon has a medium level of ability or a regular level of mathematical literacy. Because some of the answers given by students have not been presented thoroughly, some students did not answer a single question and were poor in determining strategies to solve each problem. As well as the results of mathematical literacy behaviour in students at SMP Negeri 1 Plumbon, using interview techniques, also showed that they were at a medium level or in the regular category. This is because many students cannot convey their answers well and can only guess answers, especially in terms of communication, argumentation, and beliefs.

The results of the research show that students at SMP Negeri 1 Plumbon have a level of literacy ability in the medium or regular category, suggestions that can be used by teachers during learning to improve students' mathematical literacy skills by providing questions appropriate to everyday life, with appropriate delivery. Easy for students to understand as it relates to everyday life.

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