Analysis of Student's Mathematical Literacy Ability in Solving HOTS Problems in Minimum Competency Assessment

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This study aims to determine the level of mathematical literacy in the Minimum Competency Assessment. Qualitative methods were used as the research approach, and data was collected through tests. The results showed that the research subjects required special intervention on all indicators. At the basic competency level, the subjects could explore problems and connect known elements, but they struggled with formulating problems, strategizing, interpreting, and evaluating. At the competent competency level, the subjects did not write down the results of exploring problems, but they could pass other indicators well. On the other hand, advanced competency level literacy skills fulfilled all indicators. The study findings suggest that solving mathematical literacy questions requires both understanding and reasoning skills to enable students to make effective decisions.

Keywords: mathematical literacy, Minimum Competency Assessment

INTRODUCTION

Schraw and Robinson (2011) define Higher Order Thinking Skills (HOTS) as abilities that promote deeper and more conceptual forms of understanding. HOTS has become an international curriculum goal (Tan and Halili, 2015). The Partnership for 21st Century Skills (P21) also notes that HOTS, such as critical and creative thinking, can help students succeed in their future careers (Alismail and McGuire, 2015). Fensham and Alberto (2013) argue that HOTS are necessary for competing in the world of work and in personal life. Therefore, educational success can be indicated by students' level of HOTS. Developing and improving students' HOTS is the main goal of learning in the 21st century (Arifin & Retnawati, 2015). Resnick (1987, p.3) identifies several characteristics of HOTS, including non-algorithmic nature, complexity, multiple solutions, variations in decision making and interpretation, application of multiple criteria, and effortfulness. Conklin (2012, p.14) notes that HOTS encompass both critical thinking and creative thinking, which are basic human abilities that encourage individuals to look at problems critically and find creative solutions to improve their lives in new and useful ways.

Mathematical literacy is crucial for solving everyday problems using mathematical concepts. The Organisation for Economic Co-operation and Development (OECD) defines mathematical literacy as the ability to use and interpret mathematics in various contexts, involving mathematical reasoning, concepts, procedures, facts, and tools to describe, explain, and predict phenomena (pp. 14-15) (OECD, 2019). Mathematical literacy also involves the ability to reason, formulate, and interpret mathematical problems under different conditions. The Program for International Student Assessment (PISA) defines mathematical literacy as the ability to formulate and interpret mathematical problems in various contexts, including mathematical reasoning and the use of mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena (OECD, 2019). Additionally, students are expected to recognize the role of mathematics in everyday life and make constructive, reflective, and contributing judgments and decisions required by society (Nahdi et al., 2020). One of the challenges that students encounter is a lack of familiarity with the notations and symbols used in mathematical models. This makes it difficult for them to solve contextual problems related to mathematical concepts that they encounter in their everyday lives. Additionally, they may struggle to comprehend the information presented in tables and graphs, which hinders their ability to draw conclusions. Improving these skills is essential for numeracy literacy.

PISA identifies three groups of mathematical literacy competencies: the reproduction group, the connection group, and the reflection group. In the reproduction group, students can interpret and represent familiar problems, and perform simple calculations and procedures to solve routine problems. In the connection group, students can integrate and relate all content of non-routine problem-solving representation situations by using several clear methods in simple mathematical reasoning. In the reflection group, students solve complex problems and use many complex methods to make generalizations in solving problems. This group includes mathematical reasoning and the use of mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena (Thomson et al., 2013).

The government is implementing a Minimum Competency Assessment (AKM) system to improve students' literacy skills. This system uses the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) as benchmarks for international-level assessment (Sherly et al., 2020, pp. 186). According to the Center for Assessment and Learning (2020), the assessment results will be used as a reflective tool for each educational unit to take steps toward improving the quality of learning.

The AKM system assesses students' basic abilities, including literacy skills (understanding various types of texts) and numeracy (the ability to think using reason) by presenting problems in various contexts. This allows students to solve problems not only by mastering content (Pusmenjar, 2020) but also by developing reasoning skills. In addition to solving routine problems, students must be able to solve non-routine problems that require literacy and numeracy skills, so that they can master theory and develop practical skills.

However, based on Handayu's 2020 research titled "Analysis of the Minimum Competency Assessment Items (AKM) for Junior High Schools Judging from the PISA Mathematical Literacy Domain" in a public junior high school in Bandung City, student achievement in mathematical literacy skills for formulating Minimum Competency Assessment simulation questions was found to be lacking. While almost all students were able to apply and interpret the concepts, some still made mistakes in their application and were unable to logically evaluate mathematical solutions. To improve junior high school students' mathematical literacy skills, both teachers and prospective teachers need to provide experiences in solving everyday problems. This is because the students' mathematical literacy skills in solving Minimum Competency Assessment questions are still in the low category. Thus, research on mathematical literacy skills at the high school level is necessary.

Based on observations in a junior high school, the researcher obtained one of the students' answers to AKM model questions regarding data content and uncertainty that had been previously given by a mathematics teacher. The answer showed that the student understood the concept of determining opportunity and could comprehend the context of the problem by identifying what was known and asked. However, the student did not use the available data and was imprecise in applying the concepts to answer the questions. Interviews with several mathematics teachers in junior high schools revealed that students had difficulty recalling the correct concepts for solving contextual problems. Additionally, when given non-routine questions, students tended to lack mastery of the relevant concepts, making it difficult for them to solve the problem.

This is reinforced by Pusmenjar's explanation (2020) that students need to understand data and uncertainty in everyday life to obtain information and present simple data from various sources (pp. 89). Data and uncertainty are ubiquitous in everyday life, ranging from the number of consumers to report card lists, as well as uncertainties such as whether it will rain today. Therefore, students must understand how to present data and grasp the uncertainty of an event.

This study aims to: (1) determine students' mathematical literacy skills in solving Minimum Competency Assessment model questions at the level that requires special intervention, (2) determine students' mathematical literacy skills in solving Minimum Competency Assessment model questions at the basic level, (3) assess students' mathematical literacy skills in solving Minimum Competency Assessment model questions at the proficient level, and (4) evaluate students' mathematical literacy skills in solving Minimum Competency Assessment model questions at advanced levels.

Thorne & Thomas (2009:2) state that High Order Thinking Skills (HOTS) is a process thinking at a higher level than simply remembering facts or re-explaining something learned from others. HOTS requires someone to understand, conclude, connecting facts with concepts, categorizing, searching, looking for facts in an event what happens, and find a solution to a problem that occurs. Schraw and Robinson (2011: 2) defines Higher Order Thinking Skills in the current context as abilities that increasing deeper and conceptual forms of understanding. King, Godson, & Rohani (1998:11) states that higher order thinking involves various thought processes that are applied to The situation is complex and has many reasons.

Higher Order Thinking Skills (HOTS) are characterized by two main abilities: critical thinking and creative thinking (Conklin, 2012). Resnick (in Budiman & Jailani, 2014) identifies several other characteristics of HOTS, including non-algorithmic, complex nature, multiple solutions, variations in decision making and interpretation, application of multiple criteria, and requiring significant effort. According to Brookhart (2010), HOTS include analyzing, evaluating, and creating, as well as logical reasoning, decision making, critical thinking, problem-solving, creativity, and creative thinking. Arwood (2011) emphasizes that individuals can combine concepts by assembling a frame of mind, speaking, writing, reading, seeing, and counting. Brookhart and Nitko (2011) divide the cognitive domain into two categories: Lower Order Thinking Skills (LOTs) and Higher Order Thinking Skills (HOTS). LOTs include remembering, understanding, and applying, while HOTS include analyzing, evaluating, and creating (Anderson & Krathwohl, 2001).

According to Solomon (2009), students should develop a participation identity to improve their mathematical literacy skills. This identity describes the relationship between students' knowledge and understanding of mathematical concepts and problems (pp. 20). In other words, students can relate the mathematical concepts they have learned to the problems they face in everyday life, making it easier for them to understand and solve these problems. By applying mathematics to real-life situations, students can better understand the material they are studying (Ningsih, 2021). To reason mathematically and solve problems, students need mathematical literacy skills. Putra and Vebrian (2020) state that mathematical literacy involves an individual's ability to reason mathematically and formulate, apply, and interpret problems that include concepts, procedures, facts, and tools. They must understand the role of mathematics in everyday life by describing, explaining, and predicting phenomena, and making informed decisions as 21st-century citizens who build, care, and think (pp. 6). According to Hong (2020), "literacy related to mathematics concerns the ability to work with numbers in everyday life." Mathematical literacy is simply the application of mathematical knowledge in everyday life (Ojose, 2011). Stecy & Turner (2015) define mathematical literacy as the ability to use mathematical thinking to solve everyday problems and prepare for the challenges of life. This ability involves not only arithmetic but also broader knowledge (De Lange, 2006). Broekman (2008) emphasizes that mathematical literacy is driven by the application of mathematics to real-life situations. It enables learners to develop the ability and confidence to think numerically and spatially, interpret and critically analyze everyday situations, and solve problems. From the definitions above, it can be concluded that mathematical literacy is an individual's ability to interpret and formulate mathematical problems in various contexts using mathematical concepts. Visual representations such as graphs, tables, diagrams, and other media information can help explain or describe things related to real life.

The ability to analyze involves breaking down complex concepts into simpler and more understandable parts (Yusuf, 2017). Analytical skills are considered the most basic of the higher-order thinking skills and include differentiating, organizing, and attributing (Krathwolh, 2002). To assess students' analytical abilities, Brookhart (2010) suggests that questions and assignments should require students to break down information into parts and reasons and to identify the relationships between them. Students should first identify the most important and relevant elements of the problem and then build appropriate relationships from the information provided (Gunawan & Palupi, 2012).

According to Yusuf (2017), the ability to evaluate involves making judgments based on predetermined criteria/standards. Operational verbs that fall under this ability include assessing, comparing, criticizing, concluding, distinguishing, decoding, interpreting, and connecting (Arikunto, 2012). On the other hand, the ability to create involves putting elements together to form a coherent whole and directing students to produce a new product (Gunawan & Palupi, 2012). The Directorate General of Primary and Secondary Education (2017) defines the ability to create as the ability to generate one's own ideas or ideas from others. Verbs associated with the ability to create include produce, plan, and create (Krathwohl, 2002). The creation process can be divided into three stages: problem description, where students try to understand the assessment task and find solutions; solution planning, where students examine possibilities and make plans; and solution execution, where students successfully carry out their plans (Krathwohl & Anderson, 2001).

Numeracy is the ability to identify, understand, and use numerical statements in various everyday contexts (Adaramola et al., 2014). In simpler terms, it means the ability to solve real problems related to numbers (Askew, 2011). Quantitative literacy, which is broader than numeracy, refers to a person's ability to identify, understand, and use quantitative statements in everyday contexts. The main component of this ability is the ability to adapt quantitative statements to familiar or unfamiliar contexts (Hallet, 2003).

The Minimum Competency Assessment's assessment of mathematical literacy in student work measures not only specific topics or content, but also various contexts and cognitive abilities at multiple levels (Pusmenjar, 2020). The Center for Assessment and Learning (2020) divides content components into four groups: 1) numbers; 2) measurement and geometry; 3) data and uncertainty, and 4) algebra. Mathematical literacy also plays a vital role in the world of work. Although computers have helped improve our performance, mathematical literacy skills are still necessary. Current work demands focus on understanding systems and developing them, rather than on mathematical calculations (Holyes, 2010).

To contribute to the implementation of this curriculum, tasks that enhance students' mathematical literacy, such as PISA-like problems, are important to develop (Dewantara et al., 2015).

According to Nuurjannah (2018), there are six indicators of a literate student's achievement in mathematics: 1. Formulating problems or understanding concepts, 2. Using reasoning to solve problems, 3. Connecting mathematical abilities with various contexts, 4. Solving problems, 5. Communicating them in mathematical language, and 6. Interpreting mathematical abilities in everyday life and various contexts. The National Council of Teachers of Mathematics (NCTM) (1989) states that becoming literate should develop a student's mathematical power. From this definition, it can be concluded that there are four main components to mathematical literacy in problem-solving: exploring (activities to gain new experiences from new situations), connecting and reasoning logically, and using various mathematical methods. The Programme for International Student Assessment (PISA) (2012) defines mathematical literacy as an individual's capacity to formulate, employ, and interpret mathematics. This capacity includes formulating, applying, and interpreting mathematical problems. According to Efriani et al. (2019), the mindset is trained through the process of literacy, especially mathematical literacy, by formulating, applying, and interpreting problems. Hwang & Ham (2021) also emphasize that PISA's definition of mathematical literacy requires the ability to formulate problem situations, employ mathematical problems, and interpret mathematics in various contexts. Stacey & Turner (2015) define mathematical literacy as having the power to use mathematical thinking to solve everyday problems and be better prepared to face the challenges of life. This mindset includes problem-solving thinking, logical reasoning, communicating, and explaining and is developed based on concepts, procedures, and mathematical facts that are relevant to the problems at hand (Oktiningrum et al., 2016). The mathematical literacy process begins by identifying real problems and formulating the problem mathematically based on the concepts and relationships inherent in the problem. After obtaining an appropriate mathematical form of the problem, certain mathematical procedures are employed to obtain mathematical results, which are then interpreted back into the initial problems (Purnomo et al., 2022). People with mathematical literacy skills can estimate, interpret data, solve everyday problems, reason in numerical, graphic, and geometric situations, and communicate using mathematics. Indicators of mathematical literacy skills include exploring, formulating problems, connecting, implementing problem-solving strategies, interpreting, and evaluating.

Baro'ah (2020) argues that the Minimum Competency Assessment is a simplification of the National Examination system carried out by grade IV, VIII, and XI students. The results of this assessment will be used as evaluation material for schools to improve further learning abilities (pp. 1.067). The Minimum Competency Assessment System is different from the National Examination system. This Minimum Competency Assessment tests a minimum, rather than all, materials in the curriculum. Novita et al. (2021) agree that the Minimum Competency Assessment measures students' cognitive learning outcomes, including essential and sustainable reading and numeracy literacy across classes and levels (pp. 174). Its nature is minimal because not all content in the curriculum is tested. Based on this description, it can be interpreted that the Minimum Competency Assessment assesses basic abilities, including reading and mathematical literacy, at a minimum level. According to Traffer (2006), numeracy is the ability to manage numbers and data, and to evaluate statements based on problems and reality involving mental abilities and estimation in real contexts.

The results of the Minimum Competency Assessment can be categorized into four different levels of competence. The order of competency levels from the least to the highest is 1) Special Intervention Needs, where students have limited mathematical knowledge. 2) Basic, where students have basic mathematical skills such as basic computation using direct equations, basic concepts related to geometry and statistics, and solving simple routine math problems. 3) Proficient, where students can apply their mathematical knowledge in more diverse contexts. 4) Advanced, where students can use reasoning to solve complex and non-routine problems based on their mathematical concepts (Pusmenjar, 2020).

RESEARCH METHOD

This research is qualitative and explores the mathematical literacy abilities of seventh-grade students in solving HOTS questions in the Minimum Competency Assessment. The goal is to describe and examine their mathematical literacy competence in depth.

Subjects were chosen from class VII SMP using a selection method that took one subject from each level based on their ability to provide information and communicate well. The selection was based on the analysis of their mathematical literacy skills in solving HOTS questions on the Minimum Competency Assessment on data content and uncertainty.

HOTS questions were modified from a book called Seconds of the National AKM Numeration Assessment for SMA, which was validated by two lecturers. The instrument was limited to HOTS questions with only analyzing and evaluating levels. Data were collected through written tests followed by interviews to determine the students' mathematical literacy abilities at each level of their mathematical literacy competence in solving the Minimum Competency Assessment questions on data content and uncertainty.

TABLE 1
RESULT OF VALIDATION

Validator	First validation result	Second validation result	Third validation result
I	The problem is still lacking understood and not as expected, the question must be replaced.	Correct the sentence, in question, number 1a change it into the form of a description, and fix the answer key in data retrieval from infographics.	The question has been got used.
II	Sentence in question poorly understood, problems and no answer yet appropriate, the question must be replaced.	Fix order the sentence and the key answer in data retrieval from infographics.	The question has been got used.

The data analysis technique used in this research is interactive data analysis using the Miles and Huberman model (Sugiyono, 2019, pp. 321). The technique involves the following steps:

1. Reducing the data by administering a modified question from the Minimum Competency Assessment and categorizing the level of mathematical literacy competence. The results are then analyzed to identify mathematical literacy skills and become material for simplified interview questions.
2. Presenting data on the grouping of mathematical literacy competency levels, descriptions of mathematical literacy abilities, and the results of selected students' Minimum Competency Assessment tests. Additionally, the results of student interviews are presented in the form of notes.
3. Drawing conclusions by describing the combination of student test results and interview results, as well as supporting theories.

RESULT AND DISCUSSION

This research aims to determine students' mathematical literacy skills in solving HOTS questions in the Minimum Competency Assessment. The study was conducted at a junior high school. To analyze mathematical literacy skills, four students from each level of competence (special, basic, proficient, and advanced) were selected, analyzed, and interviewed to obtain clear information. The data was obtained from the test results of the Minimum Competency Assessment model, as shown in Table 2.

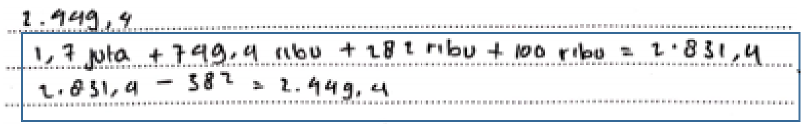
TABLE 2
PERCENTAGE OF RESULTS OF GROUPING MATHEMATICAL LITERACY COMPETENCY LEVELS

Mathematical Literacy Competency Level	Percentage (%)
Need Special Intervention	11,11%
Base	66,66%
Competent	16,66%
Proficient	5,55%

After grouping the level of mathematical literacy competence, four subjects were selected from among those who had taken the Minimum Competency Assessment model test. The data used in this study was the result of working on a mathematical literacy ability test that had been modified from the Minimum Competency Assessment model in terms of data content and uncertainty, as well as interviews. The results of the tests and student interviews were then described. The following is a summary of the results of the mathematical literacy test, which consisted of Minimum Competency Assessment model questions and interviews about mathematical literacy skills in the categories of competency levels that require special, basic, proficient, and advanced interventions.

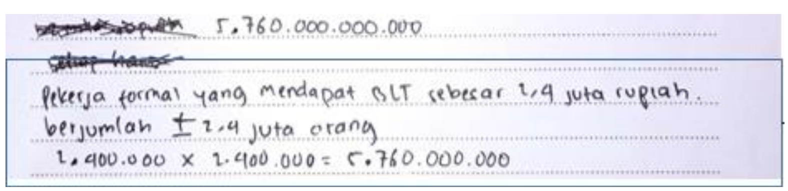
Research Subjects Competency Level Requires Special Intervention (S-PIK)

FIGURE 1
RESULTS OF WORK ON S-PIK NUMBER 1A



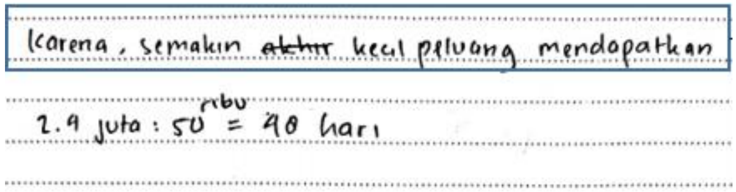
Based on Figure 1, S-PIK's work indicates that they have not been able to completely and correctly solve the problem. S-PIK has difficulty remembering the concept of opportunity, making it difficult to explore, formulate, and connect material when solving problems. When performing addition operations, S-PIK does not represent them in numerical notation, resulting in an error in the result; for example, writing 2.831.4 instead of 2,831.4 thousand or 2,831,400. The interview results also indicate that S-PIK was not able to explore questions and had difficulty interpreting the information contained within them. They did not write down the known and unknown elements of the questions clearly. Even when using concepts that are appropriate to the problem situation, S-PIK still struggles, especially when they cannot remember concepts and relate to the material. Based on the results of tests and interviews, it can be concluded that S-PIK has not understood the meaning of the questions and has been unable to solve them, despite trying to do so with their understanding.

FIGURE 2
RESULTS OF WORK ON S-PIK NUMBER 1B



Based on Figure 2, it appears that the results of the S-PIK work in solving the subject matter have not been satisfactory. S-PIK merely multiplies 2,400,000 by 2,400,000, whereas to solve this problem, it is necessary to first identify opportunities for laid-off workers who are at risk of poverty. This can be achieved by determining the complement of opportunities for laid-off workers with sufficient income. S-PIK does not document known information or questions, making it difficult to determine the appropriate strategy, nor does it create mathematical models of the presented problems. Based on the results of tests and interviews, it can be concluded that S-PIK has not been able to select appropriate strategies and arithmetic operations to solve the problems presented, and has thus failed to meet the indicators for problem-solving strategies.

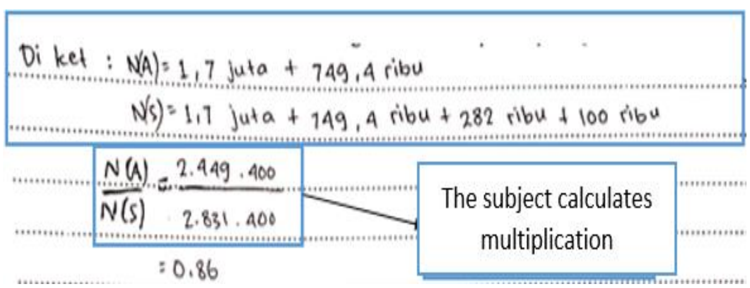
FIGURE 3
RESULTS OF WORK ON S-PIK NUMBER 1C



Based on Figure 3, S-PIK can argue to interpret the given problems, but their answer is incorrect. The mathematical proof provided by S-PIK does not match the given questions. S-PIK states that 2.4 million divided by 50 thousand is equal to 48 days, whereas the required proof is the opportunity for laid-off workers vulnerable to experiencing poverty to receive assistance every day. To do this, the formula P=n(A)/n(S) is used, where n(A) is the number of occurrences of 50,000 and n(S) is the number of laid-off workers who are vulnerable to poverty. Thus, it can be said that S-PIK has not been able to properly interpret the problem indicators. Based on the results of tests and interviews, it can be concluded that S-PIK does not understand the context of the problems in the questions. S-PIK was confused when asked to explain the results of their work. S-PIK mentions the keywords contained in question number 1b, which are the opportunity for workers with sufficient income being 4 out of 10. However, S-PIK finds it difficult to solve the problem.

Research Subjects Basic Competency Level (S-D)

FIGURE 4
RESULTS OF WORK FOR S-D NUMBER 1A



Based on Figure 4, S-D's work on the ability to explore shows that they can solve problems correctly. They use appropriate concepts, can identify and classify things that are known in the presented questions (n(A) and n(S)), and can perform addition and division to determine the possibility of formal workers being laid off. The results of the interview showed that the subject was able to understand the questions presented.

In question number 1b, SD did not write down the answer. The following is an interview transcript related to the implementation of the ability to apply:

> Interviewer: "Do you understand it now?"
> S-D: "I'm still confused, ma'am. I don't understand how to do it."

Based on the interview excerpt above, SD has not been able to understand the context of the problem in terms of application ability. S-D can mention aspects that are known and asked, but is confused in choosing the appropriate strategy, making it difficult to solve the problem.

In question number 1c, SD also did not write down the answer. The following is an interview transcript regarding working on the ability to solve problems with certain strategies:

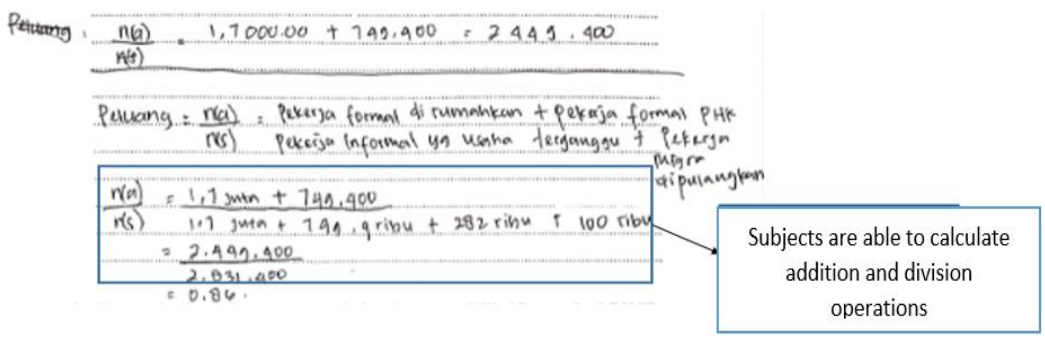
Interviewer: “Do you understand the problem now?”
S-D: “Still confused, ma’am. I don’t know how to solve it.”

Based on interview excerpts, SD has not been able to reason to solve problem number 1c. As in question number 1b, SD is still confused about what formula to use to solve the ability problem.

Based on the results of tests and interviews, it can be concluded that SD can solve the problems presented by understanding the context of the problems presented so that they can achieve abilities. However, SD has not been able to understand and solve the problem of interpreting and evaluating skills.

Research Subjects Proficiency Level (S-C)

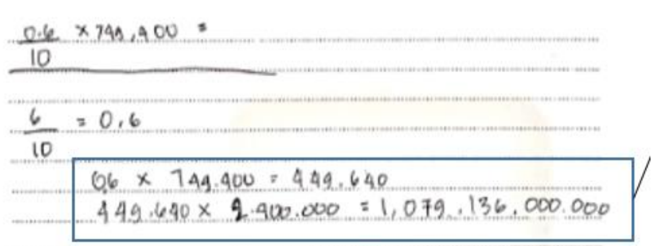
FIGURE 5
RESULTS OF WORK FOR PROFICIENCY LEVEL (S-C) NUMBER 1A



According to Figure 5, S-C was able to fully and accurately solve the problem. They identified and categorized known factors by writing n(A) = formal workers laid off + formal workers laid off and n(S) = informal workers + migrant workers, even though they did not write n(S) completely. S-C demonstrated an understanding of probability concepts and correctly applied basic addition and division algorithms. The interview results indicate that S-C comprehended the question.

S-C was able to recall the concepts used to solve the presented problems, perform addition and multiplication operations, interpret the presented infographics, and identify and categorize known factors in the problem. Excerpts from the interview with S-C demonstrate their ability to explain how to solve the problem and arrive at the correct result. Based on the test and interview results, it can be concluded that S-C understood the question and solved the problem successfully.

FIGURE 6
RESULTS OF WORK FOR PROFICIENCY LEVEL (S-C) NUMBER 1B



Based on Figure 6, the results of working on S-C to solve the problem show that the subject can choose and apply the correct strategy. S-C calculates the probability of workers who are vulnerable to poverty at 0.6. Then, it determines the number of laid-off workers who are vulnerable to poverty by multiplying 0.6

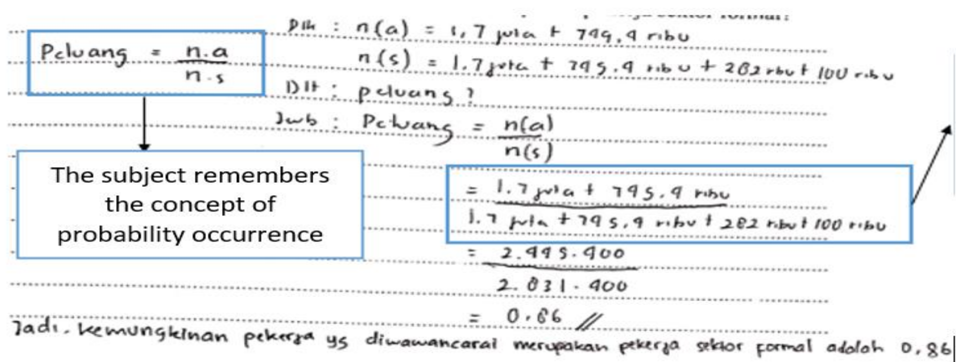
by 749,400. Finally, it obtains the requested allocation of funds by multiplying the number of workers with BLT funds.

The results of tests and interviews indicate that S-C can solve the presented problems appropriately and explain the results of the answers obtained, showing that S-C is capable. However, in response to a specific question, S-C was unable to solve the presented problem. An interview transcript shows that S-C had difficulty understanding the context of the problem, indicating that S-C had not yet achieved the ability in that area.

Overall, S-C is categorized as having a proficient competence level in all stages of ability. The subject can determine appropriate strategies, apply them to solve problems, and interpret the results obtained, even without making mathematical models for solving problems. However, the subject only passed one stage of ability, which is determining the relationship of numbers to the presented problems.

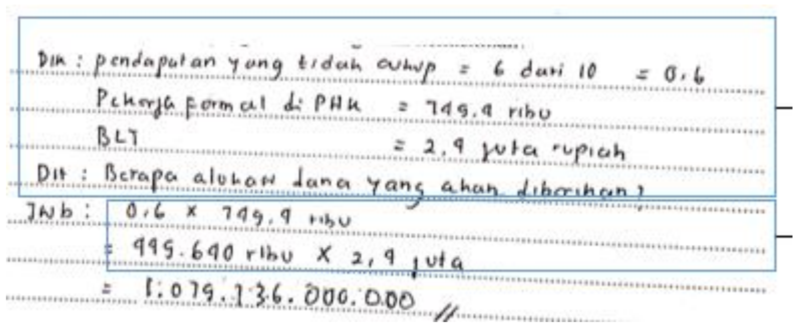
Research Subjects Advanced Competency Level (S-M)

FIGURE 7
RESULTS OF S-M WORK NUMBER 1A



Based on Figure 7, S-M's work demonstrates the subject's ability to solve the problem completely and correctly. S-M is capable of identifying and classifying things that are known and required in the presented questions. Additionally, S-M can perform addition and division operations when solving problems. The interview results indicate that the subject was able to comprehend the questions. S-M can remember the concept of probability of occurrence in the presented problems, gather information from the presented infographics, and identify and classify things that are known in the problem. Therefore, based on the test and interview results, it can be concluded that S-M understands the questions and is able to solve the problems.

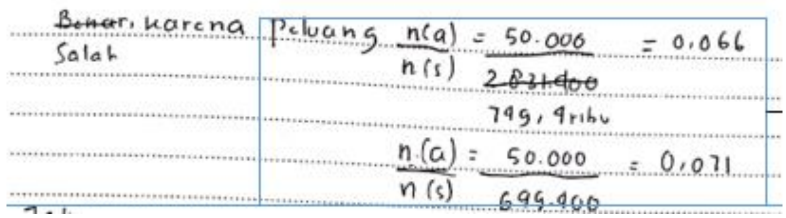
FIGURE 8
RESULTS OF S-M WORK NUMBER 1B



Based on Figure 8, it is clear that S-M can solve problems by writing down known and unknown information, selecting a strategy, and applying it to solve the problem. For example, to solve the problem of 0.6 times 749.4 thousand, S-M wrote the calculation and obtained the result of 449,640 thousand. Afterwards, S-M multiplied this result by 2.4 million. However, S-M did not create a mathematical model to solve the problem.

Based on test results and interviews, it can be concluded that MS can solve problems correctly and explain the results of their answers. Therefore, MS has the ability to explore and formulate solutions to problems.

FIGURE 9
RESULTS OF S-M WORK NUMBER 1C



Based on Figure 9, S-M can connect the representation of the concept of opportunity with the formula n(A)/n(S) and draw valid conclusions by using mathematical concepts. Although he initially answered "True," S-M realized his mistake and changed his answer to "False," but was less careful in determining n(S). From the results of tests and interviews, it can be concluded that S-M can reason using the concept of probability of occurrence and fulfills all abilities, although there was a slight error in making conclusions from the results obtained.

In the advanced category of subjects (S-M), students can reason using the concept of probability of occurrence, connect the representation of the results obtained to solve problems, evaluate the strategies used, make valid conclusions, and provide mathematical justification to support claims. Munaji and Setiawahyu's (2020) research states that students at an advanced level can give reasons related to various types of numbers in routine and non-routine situations, and justify their conclusions. According to Qilin (2013), the most important skill for these students is the ability to recognize and solve problems, as well as correct any mistakes made.

Based on the study's results, students' mathematical literacy skills in the basic, proficient, and advanced categories require special intervention. These categories have different mathematical literacy abilities when solving Minimum Competency Assessment model questions. Students in the advanced category can achieve almost all mathematical literacy skills, except for making a mathematical model of a problem. They can organize and distinguish the elements contained in the problem but are missing something in connecting these elements. Nonetheless, they can interpret the problem and make a decision. Conversely, students in the proficient and basic categories have not achieved all mathematical literacy skills due to various causal factors, such as not being accustomed to doing contextual practice questions, making frequent mistakes, and not understanding the material in the question. At the analyzing level, they can only identify problems but have not been able to connect, interpret, and determine a decision in evaluation. Even students in the category that needs special intervention do not achieve any abilities in understanding, applying, and reasoning. These students have not been able to identify, organize, connect, and interpret problems, so they are not able to make a decision. This is consistent with previous research conducted by Yunia and Zanthy (2020), who found that errors made by students in solving contextual questions were caused by students not being careful in reading and not understanding what was meant by the question. Furthermore, Sari (2015) states that mathematical literacy skills are not only limited to numeracy skills but also include the ability to apply and reason mathematically. Students' mathematical literacy skills can be seen in how they use mathematical skills to solve problems that may occur in various situations related to each individual

(Hayati & Kamid, 2019). Thus, mathematical literacy ability should not only reach the understanding level but should also be able to reach the reasoning level. The special intervention was focused on the five indicators of mathematical literacy ability. Mathematical literacy ability at the basic competency level solves AKM questions by exploring problems and connecting the known elements in the questions, but the subject is hindered in formulating problems, formulating strategies, interpreting, and evaluating. Mathematical literacy ability in the competent level category is capable of solving problems without writing down the results of exploring problems, but they pass other indicators well. Mathematical literacy skills at the advanced competency level can solve problems and meet all indicators of mathematical literacy.

CONCLUSION

The results indicate that the subject's mathematical literacy ability in the category of competency level needs special intervention due to being hindered by five indicators of mathematical literacy ability. In the category of basic competency level, the subject is able to solve AKM questions by exploring problems and connecting the known elements in the questions but is hampered in formulating problems, formulating strategies, interpreting, and evaluating. In the category of competence level, the subject is capable of solving problems without writing down the results of exploring problems and performs well in the other indicators. Finally, in the category of advanced competency level, the subject is able to solve problems and meets all indicators of mathematical literacy.

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