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STUDENT'S MATHEMATICAL LITERACY IN SOLVING *ASESMEN KOMPETENSI MINIMUM* IN TERMS OF GENDER

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Abstrak

Literasi matematika adalah kemampuan manusia untuk merumuskan, menggunakan, dan menafsirkan pengetahuan serta keterampilan matematika dalam berbagai konteks kehidupan nyata. Penelitian kualitatif deskriptif ini bertujuan untuk mendeskripsikan literasi matematika 4 siswa kelas XII dalam menyelesaikan soal Asesmen Kompetensi Minimum (AKM), di salah satu SMA Muhammadiyah Gresik berdasarkan gender. AKM merupakan penilaian mendasar kemampuan siswa sebagai media mengembangkan kompetensi diri agar dapat berpikir kritis dalam kehidupan sehari-hari. Pengumpulan data menggunakan tes literasi matematika AKM dan wawancara, data tes dan wawancara dianalisis berdasarkan indikator literasi matematika. Hasil penelitian menunjukkan bahwa kemampuan literasi siswa perempuan memenuhi indikator dalam proses merumuskan, menerapkan, dan menafsirkan permasalahan dengan solusi yang tepat. Sedangkan siswa laki-laki memenuhi indikator dalam proses merumuskan dan menerapkan. Guru perlu melakukan pembiasaan kepada siswa untuk menyelesaikan soal-soal terkait literasi matematika.
Kata kunci: Literasi matematika, Asesmen Kompetensi Minimum, gender

Abstract

Mathematical literacy is the human ability to formulate, use, and interpret mathematical knowledge and skills in various real-life contexts. This descriptive qualitative study aims to describe the mathematical literacy of 4 grade XII students in solving the *Asesmen Kompetensi Minimum* (AKM) questions, in one of the Muhammadiyah Gresik High Schools based on gender. AKM is a basic assessment of students' abilities as a medium for developing self-competence so that they can think critically in everyday life. Collecting data using the AKM mathematical literacy test and interviews, test and interview data were analyzed based on indicators of mathematical literacy. The results showed that the literacy skills of female students met the indicators in the process of formulating, implementing, and interpreting problems with appropriate solutions. Meanwhile, male students met the indicators in the process of formulating and implementing. Teachers need to familiarize students with solving problems related to mathematical literacy.
Keywords: Mathematical literacy, *Asesmen Kompetensi Minimum*, gender

INTRODUCTION

Mathematics is one of the sciences that coexists with everyday life. Currently, the problems in life are increasingly complicated and difficult which results in increasing demands for skills that must be possessed by humans. In addition to the ability to solve problems and think critically which is emphasized by several countries in the field of learning, mathematical literacy is one of the parts needed to improve skills (OECD, 2021; Rizki & Priatna, 2018).

Mathematical literacy according to Sumirattana, Makanong, & Thipkong (2017) refers to students' knowledge and ability to apply mathematical knowledge gained from class to everyday life involving mathematics. OECD (2018) states that mathematical literacy is the human ability to formulate, use, and interpret mathematical knowledge and skills in various real-life contexts. Mathematical literacy skills can help students understand the use of mathematics in life and can be used to make the right decisions (Hayati & Kamid, 2019; Jannah, Putri, & Zulkardi, 2019; Umbara & Suryadi, 2019). Students who have mathematical literacy skills are

able to reason, analyze and communicate ideas effectively when formulating, using, and interpreting everyday life problems to compete globally (OECD, 2018; Haara, Bolstad, & Jenssen, 2017).Mathematical literacy is one of the challenges in the world of mathematics education, especially in Indonesia (Priatna & Rizki, 2019; Manoy & Sari, 2019). This is supported by the 2018 PISA (Program for International Students Assessment) research that Indonesia is ranked 72nd out of 78 participating countries (OECD, 2019). PISA is an international study that measures students' reading literacy, mathematical literacy, and scientific literacy (Thomson, et al., 2019). Based on the results of the PISA research, it can be seen that the mathematical literacy ability of Indonesian students is low. Meanwhile, mathematical literacy is one of the important skills that students can use to solve problems in the context of everyday life. So it is necessary to improve and develop students' mathematical literacy skills (Sumirattana, Makanong, & Thipkong, 2017; Rizki & Priatna, 2019).

Mathematical processes in mathematical literacy based on OECD (2018), namely: 1) Formulating situations mathematically; 2) Using concepts, facts, procedures, and mathematical reasoning; and 3) Interpret, apply, and evaluate mathematical results. There are two components of mathematical literacy according to Sumirattana, Makanong, & Thipkong (2017), namely: 1) Knowledge which consists of conceptual knowledge and procedural knowledge; and 2) Competency.

Ujian Nasional (UN) is an assessment system used in Indonesia, but the assessment system has not been able to measure students' mathematical literacy skills (Kamaliyah, Zulkardi, & Darmawijoyo, 2013; Sari & Wijaya, 2017). So that the assessment system was changed to a *Asesmen Nasional* (AN) based on the Decree of the Minister of Education and Culture No. 17 of 2021. One of the objectives of AN is to measure cognitive learning outcomes (Article 2 Permendikbudristek No. 17 of 2021). There are two aspects that are measured in AN, namely numeracy literacy skills and reading literacy skills through the *Asesmeen Kompetensi Minimum* (AKM) (Novita, Mellyzar, & Herizal, 2021). So to improve students' mathematical literacy skills, the government develops and implements AKM. AKM according to Wahidin & Cahyanovianty (2021) and Fauziah, Sobari, & Robandi (2021) is an assessment of students' basic abilities that is used as a medium to develop self-competence and play a positive role in society so that they can think critically in everyday life.

AKM development is used to improve innovative learning which includes students' reasoning, reading literacy, and numeracy skills (Rohim, Rahmawati, & Ganestri, 2021; Fauziah, Sobari, & Robandi, 2021), appropriate AKM problems must include reading and numeracy literacy (Hasanah , Edwita, & January, 2021). The basis for developing AKM questions refers to the PISA mathematical literacy questions (Fauziah, Sobari, & Robandi, 2021; Hasanah, Edwita, & Januar, 2021; Sukriyah & Ayuningtyas, 2020). The AKM questions consist of multiple choice, complex multiple choice, matchmaking, short entries, and descriptions (Kemendikbud, 2020). Table 1 below is a component of AKM questions.

Table 1. Components of AKM questions

	Literacy Reading	**Numeration**
Content	Information Text and Literature	Algebra, Numbers, Geometry, Data Measurement and Uncertainty
Cognitive Process	Finding, Interpreting and Integration, Evaluation and Reflection of Information	Comprehension, Application and Reasoning
Context	Personal, Socio-Cultural, and Scientific	Personal, Socio-Cultural, and Scientific

Source: Asrijanty (2020)

Rahayu, Mulyono, & Cahyono (2020) stated that the factors that influence mathematical literacy skills are personal factors, environmental factors, and instructional factors. However, gender differences are also one of the factors that affect students' mathematical literacy skills. Because gender is a characteristic that distinguishes individuals in processing information and learning (Nurani, et al., 2020). Gender differences are also one of the factors that distinguish a person's way of thinking in deciding the solution to a problem (Davita & Pujiastuti, 2020). This creates differences that can affect the psychology of female and male students in understanding mathematics (Zubaidah, 2013). These differences affect the development of students' learning abilities in learning mathematics (Zhu, 2017). Based on Indrawati & Tasni's (2016) observations, male students are superior in mathematics, while female students are superior in writing and language. Setiawan, Inganah, & Ummah, (2019) stated that the mathematical literacy ability of female and male students was good because they had met all indicators of mathematical literacy. Meanwhile, based on the research of Nurani, et al., (2020) the mathematical literacy ability of female students is better than male students because female students meet all indicators of

mathematical literacy while male students only meet the indicators of interpreting mathematics.

Several researchers have studied mathematical literacy with AKM questions such as Winata, Widiyanti, & Cacik, 2021; Wardani, Fathani, & Alifiani, 2021; and Chyanovianty & Wahidin, 2021. However, there has been no qualitative research on mathematical literacy on the AKM questions in terms of gender. Based on the low mathematical literacy skills of students and the change in the assessment system to AKM, researchers are interested in examining students' mathematical literacy skills in solving AKM questions in terms of gender. Teachers need to familiarize students with solving mathematical literacy problems, especially on AKM questions, in order to train students' mathematical literacy skills.

METHOD

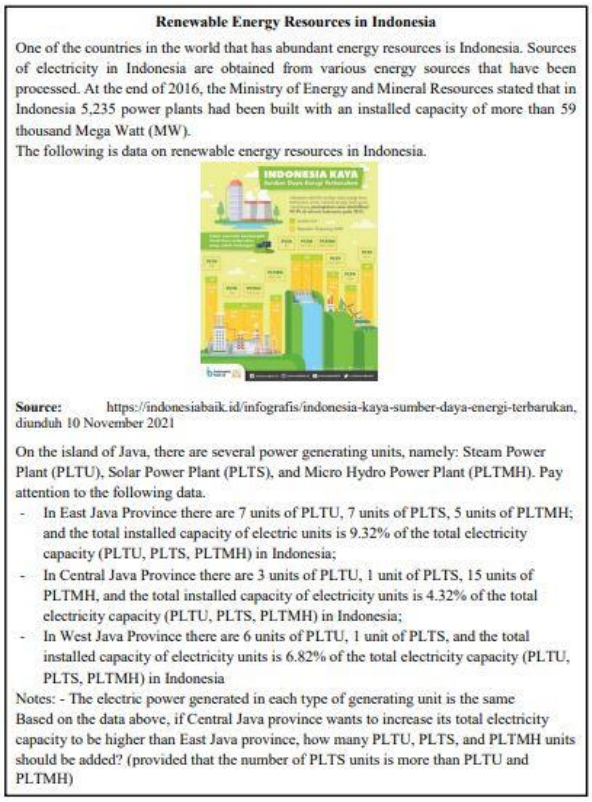
This research is a qualitative descriptive study with the aim of systematically describing students' mathematical literacy skills in solving AKM questions. Subjects were selected by purposive sampling, namely 2 male students and 2 female students from class XII SMA students. With the criteria for students with high and medium abilities, they are categorized in Table 2 which has been adjusted to the KKM of the school. As well as the consideration that students have time to conduct interviews.

Table 2. Category of mathematical ability

Score	Level
Score ≥ 85	High
70 ≤ Score < 85	Middle

Source: Nurutami, Riyadi, & Subanti (2018)

The research procedure consisted of 3 stages, namely 1) preparation and validation of the instrument; 2) data analysis; and 3) preparation of reports. The research instrument used was the AKM mathematical literacy test and interview guidelines. The data collection method used the description of the AKM mathematical literacy test with algebraic content with a scientific context referring to the national guidelines, as shown in Figure 2 adapted by Sujatmiko, Suparno, & Miyanto (2020). While interviews were used to complete the data on students' mathematical literacy test results in order to obtain more in-depth information. There are 3 techniques for analyzing mathematical literacy test results and interview results, namely 1) data reduction; 2) data presentation; and 3) conclusion (Setiawan, Inganah, & Ummah, 2019). Figure 1 is a matter of mathematical literacy (AKM) used in this study.



Renewable Energy Resources in Indonesia

One of the countries in the world that has abundant energy resources is Indonesia. Sources of electricity in Indonesia are obtained from various energy sources that have been processed. At the end of 2016, the Ministry of Energy and Mineral Resources stated that in Indonesia 5,235 power plants had been built with an installed capacity of more than 59 thousand Mega Watt (MW).

The following is data on renewable energy resources in Indonesia.

Source: https://indonesiabaik.id/infografis/indonesia-kaya-sumber-daya-energi-terbarukan, diunduh 10 November 2021

On the island of Java, there are several power generating units, namely: Steam Power Plant (PLTU), Solar Power Plant (PLTS), and Micro Hydro Power Plant (PLTMH). Pay attention to the following data.

- In East Java Province there are 7 units of PLTU, 7 units of PLTS, 5 units of PLTMH; and the total installed capacity of electric units is 9.32% of the total electricity capacity (PLTU, PLTS, PLTMH) in Indonesia;
- In Central Java Province there are 3 units of PLTU, 1 unit of PLTS, 15 units of PLTMH, and the total installed capacity of electricity units is 4.32% of the total electricity capacity (PLTU, PLTS, PLTMH) in Indonesia;
- In West Java Province there are 6 units of PLTU, 1 unit of PLTS, and the total installed capacity of electricity units is 6.82% of the total electricity capacity (PLTU, PLTS, PLTMH) in Indonesia

Notes: - The electric power generated in each type of generating unit is the same

Based on the data above, if Central Java province wants to increase its total electricity capacity to be higher than East Java province, how many PLTU, PLTS, and PLTMH units should be added? (provided that the number of PLTS units is more than PLTU and PLTMH)

Figure 1. Mathematical literacy test instrument (AKM) Adaptation of Sujatmiko, Suparno, & Miyanto (2020)

The mathematical literacy indicators used are as shown in Table 3 below.

Table 3. Mathematical literacy indicators

Math Process	Mathematical literacy indicators
Formulate (Q)	Identify mathematical concepts and significant variables from real-world problems (Q1)
	Describe the mathematical structure of the problem using symbols, appropriate variables, and diagrams (Q2)
Apply (R)	Design and implement strategies to get solutions to problems (R1)
	Apply mathematical concepts, rules, and facts to help find solutions to problems (R2)
Interpret (S)	Reinterpret calculation results from mathematical procedures in real-world contexts (S1)

Source : OECD (2018) dan OECD (2021)

RESULT AND DISCUSSION

The researcher selected 2 female students (AD with high math ability and SN with moderate math ability) and 2 male students (HD with high math ability and MF with moderate math ability). Subject selection is based on the

students' average grades in assignments, daily tests, UTS, and UAS mathematics. Table 4 is the arithmetic mean of the selected students.

Table 4. Average math scores of subjects AD, SN, HD, and MF

Subject	Score	Level
AD	88.5	High
SN	78.7	Middle
HD	87,4	High
MF	77.9	MIddle

The data from this study are the results of the completion of the AKM description test on algebraic content and the results of interviews. The following describes the results of the AKM mathematical literacy test and student interviews.

Results of AKM Mathematical Literacy Test and Interview of Female Students

Subject 1 (AD)

The results of the completion of the AD subject are shown in Figure 2 below.

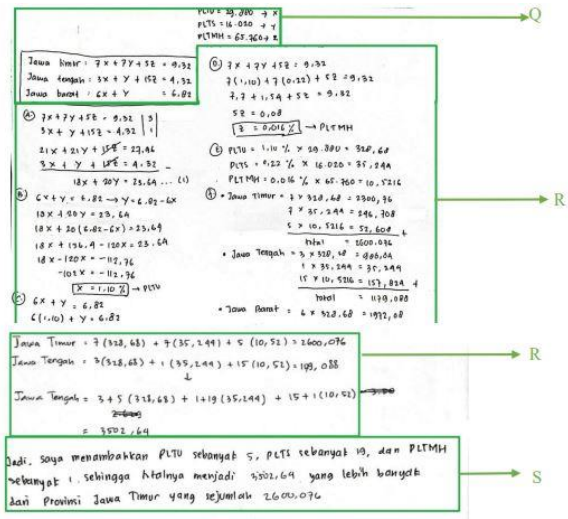


Figure 2. Solution result of AD

The following is AD's statement in the interview to support the results of its completion in the formulating process.

*P : Have you ever met and solved questions like (AKM)? **(Q1)***
*AD : Never, but simpler. The question is like the AKM question, but I never tried to finish **(Q1)***
*P : What information do you get from the AKM questions?? **(Q1)***
*AD : Electric power capacity throughout Indonesia, the number of units and the Electrical capacity of three provinces, and installed electricity capacity in percent. and asked electricity capacity in Central Java is bigger than East Java.**(Q1)***
*P : What math material can you relate to AKM questions?? **(Q1)***
*AD: SPLTV. **(Q1)***
*P : What do x, y, and z mean in the equation?? **(Q2)***
*AD: I assume if x is PLTU, y is PLTS, and z is PLTMH **(Q2)***
*P : Do you use mathematical symbols to solve problems? If so, what symbol did you use?**(Q2)***
*AD: Yes, I use the +, -, and other symbols to solve equality.**(Q2)***
*P : Did you convert the defined problem into the for mathematics? If so, how do you change the problem?**(Q2)***
*AD: Yes, I changed the data for each province into an equation. for example in East Java Province, I changed 7 units of PLTU, 7 units of PLTS, 5 units of PLTMH; and the total installed capacity of electrical units by 9.32% to 7x+7y+5z=9.32% **(Q2)***

Based on the results of the solution in Figure 2 (Q), AD can write down whatever is known in the problem. AD is able to identify mathematical aspects and variables used in solving problems in real-world contexts. In the interview statement, AD can state the information obtained from the problem according to the Q1 indicator. This is in line with the results of Lailiyah's research (2017). AD is also able to write examples using symbols and convert the statements in the problem into mathematical equations according to the Q2 indicator.

The following is AD's statement in the interview to support the results of its completion in the process of applying.

*P : What strategy did you use to solve this problem? **(R1)***
*AD: Eliminate and substitute equations in each province and change the percent form to regular form, then look for equations that are not in percent form **(R1)***
*P : Why did you use this strategy? Are there other steps? **(R1)***
*AD : Because the form of the equation that I get is three, so this step is the simplest step to find the highest electric power capacity. There's no other move I'm thinking of. **(R1)***
*P : How much time do you need to solve the AKM questions?? **(R1)***
*AD: About 1 hour. **(R1)***

Based on the results of the settlement in Figure 2 (R) supported by interview statements, AD is able to design and implement strategies to solve problems, according to the R1 indicator. This is in line with the research results of Suwarsono, Juniati, & Lestari (2018). AD is also able to apply the concepts, rules, and

mathematical facts written in Figure 2 (R) to find the right solution, according to the indicator R2. AD was only able to design one strategy in solving the problem because it did not find another strategy.

The following is AD's statement in the interview to support its completion in the interpreting process.

*P : How do you conclude when you have completed the AKM questions??**(S1)***
*AD : I added 5 PLTU, 19 PLTS, and 1 PLTMH so that Central Java's electricity capacity is higher **(S1)***
*P : Have the conclusions you provided answered the AKM questions? Why?**(S1)***
*AD : Already. Because the conclusion has answered the questions.**(S1)***

Based on the results of the AD completion in Figure 2 (S) and the interview statement, AD has found the right solution and concluded with a real-world context according to the S1 indicator. AD also believes that the conclusions given have answered the question. This is in line with the results of Lailiyah's research (2017).

Subject 2 (SN)

The results of the completion of the SN subject are shown in Figure 3 below.

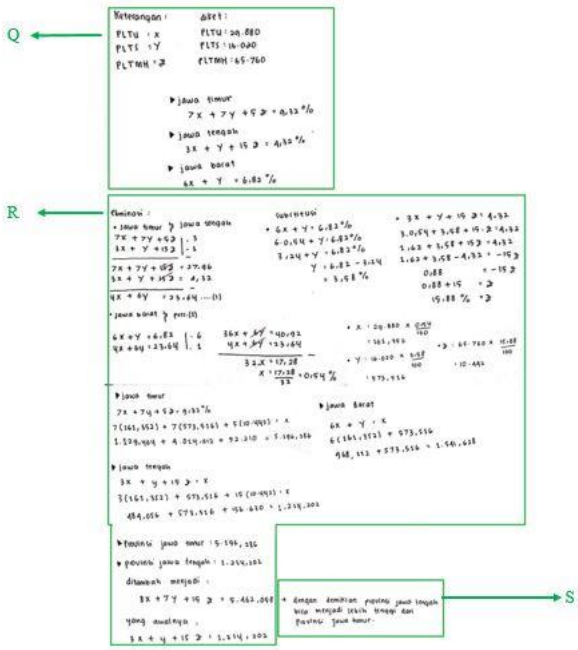


Figure 3. Solution result SN

The following is SN's statement in the interview to support the results of its completion in the formulating process.

*P : Have you ever met and solved questions like (AKM)? **(Q1)***
*SN : Once, in class X. But never encountered such a context and decimal form. **(Q1)***
*P : What information do you get from the AKM questions?? **(Q1)***
*SN : Number of units per power plant in 3 provinces with total power in Indonesia. **(Q1)***
*P : What math material can you relate to AKM questions?? **(Q1)***
*SN : System of linear equations. **(Q1)***
*P : What do x, y, and z mean in the equation?? **(Q2)***
*SN : x is PLTU, y is PLTS, and z is PLTMH **(Q2)***
*P : Do you use the symbol in solving problems?mathematics? If so, what symbol did you use? **(Q2)***
*SN : Yes, I use mathematical symbols, namely +, - , x, =, and others in the calculation to solve the problem **(Q2)***
P : Did you convert the defined problem into the form mathematics? If so, how do you change the problem?
*SN : Yes, I changed the data in the problem into 3 equations. The first equation in East Java Province, 7x+7y+5z=9.32. Central Java Province, 3x+y+15z=4.32.West Java Province, 6x+y=6.82. **(Q2)***

Based on the results of the solution in Figure 3 (Q), SN can write down what is known in the problem and is able to identify the mathematical aspects and variables used in solving problems in the real world context according to the Q1 indicator. In the interview statement, SN can mention the information obtained from the problem according to the Q1 indicator. This is in line with the results of Lailiyah's research (2017). SN is also able to write examples using mathematical symbols and variables according to the Q2 indicator. SN had encountered a similar problem but it was easier. SN is also able to convert the data in the problem into mathematical form.

The following is SN's statement in the interview to support the results of its completion in the process of applying.

*P : What steps did you use to solve the problem?? **(R1)***
*SN : First I eliminate the equations in East Java and Central Java so that I get equation 1, after that I eliminate again West Java equation and equation 1. Then get the x value and substituting into the West Java equation so I get the value of the y. After that I substituted x and y in the Central Java equation to get the z. Then I look for the values of x, y, and z that are not in percent form and substitute them for each province. So that later I will get the actual amount of electricity capacity. **(R1)***
*P : Why did you use this step? Are there other steps? **(R1)***
*SN : Because this step is the easiest step for me do to solve the problem. **(R1)***
*P : How long do you need to solve AKM questions??**(R1)***
*SN : more than 1 hour **(R1)***

Based on the results of SN's completion in Figure 3 (R) and the interview statement, SN designs and implements appropriate steps to find a solution according to the R1 indicator. This is in line with the results of research conducted by Aula, Suyitno, & Rosyida (2019). SN is able to apply mathematical concepts, rules, and facts to a system of linear equations to help find solutions according to the R2 indicator. SN did not think of other steps that could be used to find the solution. However, in the settlement, SN is still not thorough in solving the problem because the number of PLTS added is less than the number of PLTU and PLTMH.

The following is SN's statement in the interview to support the results of his completion in the interpreting process.

P : *What conclusions do you give when you have completed the questions?AKM?* ***(S1)***

SN : *The total electricity capacity in Central Java is 5,462,058 while in Java East is only 5,196,286. This shows that the electricity capacity in Central Java bigger than in East Java* ***(S1)***

P : *Have the conclusions you provided answered the AKM questions? Why?* ***(S1)***

SN : *After I reread it, it turns out that the solution I gave is still not right because I added the wrong number of electrical units in PLTS* ***(S1)***

Based on the results of SN's completion in Figure 3 (S) and interview statements, SN is able to provide conclusions in the real world context according to the S1 indicators. This is in line with the research results of Suwarsono, Juniati, & Lestari (2018). However, SN has not yet found the right solution, due to a resolution error due to lack of accuracy. SN is also aware of the completion error in adding the number of power generation units.

Results of AKM Mathematical Literacy Test and Interview of Male Students

Subject 3 (HD)

The results of the completion of Subject HD are shown in Figure 4 below.

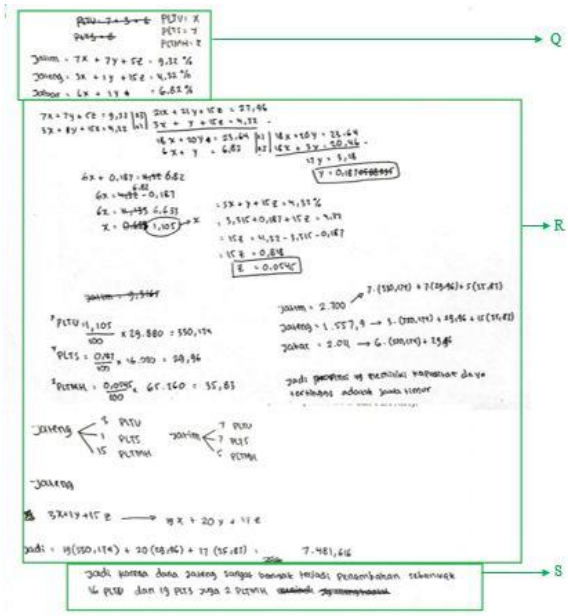


Figure 4. Solution result HD

The following is HD's statement in the interview to support its completion in the formulating process.

P : *Have you ever met and solved questions like (AKM)?* ***(Q1)***

HD : *Rarely see things like this. This is like AKM questions and the questions are more complex than the questions I usually do.* ***(Q1)***

P : *What information do you get from the AKM questions??* ***(Q1)***

HD : *It is known that there are three subjects or objects and the problem is also known as a power generator in the Provinces of East Java, Central Java, and West Java.* ***(Q1)***

P : *What math material can you relate to AKM questions??****(Q1)***

HD : *This is SPLTV material or a three-variable system of linear equations* ***(Q1)***

P : *What do x, y, and z mean in the equation?****(Q2)***

HD : *x is PLTU, y is PLTS, and z is PLTMH* ***(Q2)***

P : *Do you use the symbol in solving problems? mathematics? If so, what symbol did you use?****(Q2)***

HD : *Yes, the symbols +, -, =, are the same as others* ***(Q2)***

P : *Did you convert the defined problem into the form mathematics? If so, how do you change the problem?* ***(Q2)***

HD : *Yes, to make it easier for me to calculate. After I assume PLTU, PLTS, and PLTMH become x, y, and z. I converted the data in the three provinces into mathematical form and into 3 equations.* ***(Q2)***

Based on the results of HD's completion in Figure 4 (Q) and interview statements, HD is able to identify mathematical aspects and variables of real-world problems and understand what is being asked according to the Q1 indicator. This is in line with the research results of

Setiawan, Inganah, & Ummah (2019). HD is also able to use mathematical symbols to describe problems in mathematical form according to the Q2 indicator. In its solution, HD can assume 1 unit of power plant with variables x, y, z according to the Q2 indicator. HD is able to convert the data in the problem into mathematical form to make it easier to solve problems according to the Q2 indicator.

The following is HD's statement in the interview to support the results of its completion in the process of applying.

*P : What steps did you use to solve the problem? **(R1)***
*HD : First I assume the PLTU, PLTS, and PLTMH are x, y, z. Then Later I will make equations 1, 2, and 3. And eliminate and substitute them to get the values of x, y, and z. After I got the x, y, and z values, I immediately tried to find electrical power in Central Java. **(R1)***
*P : Why did you use this step? Are there other steps?**(R1)***
*HD : Because the step is in accordance with my thinking. There with uses the concept of matrices, but is too complex to use. **(R1)***
*P : How long do you need to solve AKM questions??**(R1)***
*HD : I need about 1 hour **(R1)***

Based on the results of HD's completion in Figure 4 (R) and the interview statement, HD was able to design and implement the correct steps to find a solution according to the R1 indicator. HD is able to apply mathematical concepts, rules, and facts to help find solutions according to the R2 indicator. HD can write down the right solution to solve the problem. This is in accordance with the research results of Davita & Pujiastuti (2020).

The following is HD's statement in the interview to support its completion in the interpreting process.

*P : How do you conclude when you finish the questions?AKM? **(S1)***
*HD:I added PLTS units to 20 units, PLTU units to 19 units, and PLTMH 17 units. It can be concluded that the amount of electric power in Java Central Java is 7,481.61 which is more than East Java, which has a large capacity of 2,700. **(S1)***
*P : Have the conclusions you provided answered the AKM questions? Why? **(S1)***
*HD : Yes, but still not enough. I already mentioned the correct conclusion previously. **(S1)***

Based on the results of HD's completion in Figure 4 (S), HD has written its conclusion but it is not quite right. HD is able to provide appropriate conclusions in his interview statement according to the S1 indicator. This is in line with the results of Lailiyah's research (2017). HD also believes that the conclusions given are correct.

Subject 4 (MF)

The results of the completion of Subject MF are shown in Figure 5 below.

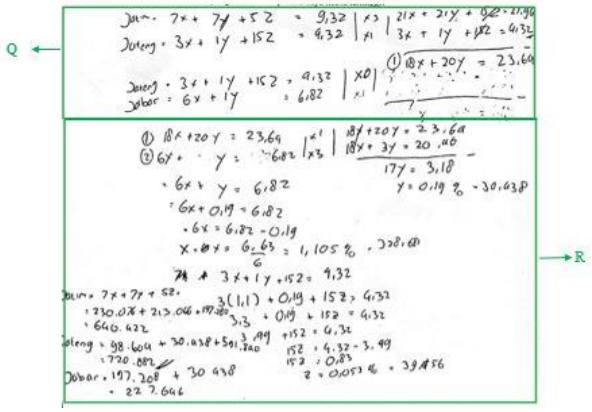


Figure 5. Solution result MF

The following is MF's statement in the interview to support the results in the formulation process.

*P : Have you ever met and solved questions like (AKM)? **(Q1)***
*MF :Never **(Q1)***
*P : What information do you get from the AKM questions??**(Q1)***
*MF : Capacity and electric power units in East Java, Central Java and West Java **(Q1)***
*P : What math material can you relate to AKM questions??**(Q1)***
*MF : Substitution and elimination. **(Q1)***
*P : What do x, y, and z mean in the equation??**(Q2)***
*MF : x is the capacity of the PLTU, y is the capacity of the PLTS, and z is the capacity PLTMH **(Q2)***
*P : Do you use the symbol in solving problems?mathematics? If so, what symbol did you use?**(Q2)***
*MF : Yes, using mathematical symbols usually like +, -, x, :. **(Q2)***
*P : Did you convert the defined problem into the form mathematics? If so, how do you change the problem?**(Q2)***
*MF : yes i'm, changed the data in the question into an equation like my answer **(Q2)***

Based on the results of the solution in Figure 5 (Q), MF does not write down what is known in the problem. However, MF can state what is known in the problem in his interview statement according to the Q1 indicator. MF is able to identify mathematical aspects and variables of real-world problems and understand what is being asked according to the Q1 indicator. This is in line with the results of Lailiyah's research (2017). MF is also able to use mathematical symbols to describe problems in mathematical form and determine existing equations according to the Q2 indicator.

The following is MF's statement in the interview to support the results of his completion in the process of applying.

*P : What steps did you use to solve the problem?? **(R1)***
*MF : Determine the electric power of each unit then substitute it back into Equality. **(R1)***
*P : Why did you use this step? Are there other steps?**(R1)***
*MF : Because of those steps I can think of. There is no. **(R1)***
*P : How long do you need to solve AKM questions??**(R1)***
*MF : 30 minute. **(R1)***

Based on the results of the MF solution in Figure 5 (R), MF designs appropriate steps to find a solution according to the R1 indicator. However, MF found an inappropriate solution due to a miscalculation. This is in line with the results of research by Lestari, Juniati, & Suwarsono (2018) and Davita & Pujiastuti (2020). MF is able to apply mathematical concepts, rules, and facts with elimination substitution to help find a solution, but the solution obtained by MF is wrong, due to carelessness when calculating.

The following is MF's statement in the interview to support the results of his completion in the interpreting process.

*P : How do you conclude when you finish the questions?AKM? **S1)***
*MF : The total electricity capacity in Central Java is already higher than East Java.**(S1)***
*P : Have the conclusions you provided answered the AKM questions?Why?**(S1)***
*MF : Already, because of the answer I got. **(S1)***

Based on the results of the MF completion in Figure 5 (S) and the interview statement, MF got the wrong solution due to an error in calculating during the application process. So that MF does not provide conclusions on the results of the settlement. This is in line with the research results of Davita & Pujiastuti (2020).

The following is a discussion of the previously described analysis of students' mathematical literacy in solving AKM questions. Based on the results of the analysis on the results of the completion and interviews, AD has good mathematical literacy skills because it meets the indicators of mathematical literacy. In the process of formulating, AD is able to write down and mention the mathematical aspects of the given problem. AD can also write and pronounce mathematical symbols and convert statements in problems into mathematical form. AD stated that he had solved a question like (AKM) but it was simpler and had encountered a question with a similar context in the AKM question. In the process of implementing, AD can design strategies to solve problems and implement them. AD is also able to write down mathematical concepts, rules, and facts to solve problems. In the process of interpreting, AD finds the right solution and conclusion to solve the problem.

SN has met the indicators of mathematical literacy. In the process of formulating, SN writes down the mathematical aspects of real-world problems and understands what is being asked. SN is also able to use mathematical symbols to describe problems in mathematical form. SN had encountered a similar problem but it was easier to solve. In the process of implementing, SN is able to design and implement appropriate strategies to find solutions. SN is also able to apply the concepts, rules, and mathematical facts of a system of linear equations to solve problems. However, SN has not gotten the right solution due to lack of accuracy when solving problems. In the process of interpreting, SN finds solutions and provides conclusions with real-world contexts, but the number of PLTS written by SN is still not correct.

HD is able to meet the indicators in the process of formulating and implementing. In the process of formulating, HD understands the problem so that he is able to write down and mention the mathematical aspects of the problem. HD is able to use mathematical symbols to describe problems in mathematical form. In the process of applying, HD is also able to design strategies and apply mathematical concepts without getting the right solution. In the process of interpreting, HD can write down the conclusion but it is not quite right. But at the time of the interview, HD was able to state the appropriate conclusions.

MF has low mathematical literacy skills because it only fulfills the indicators in the process of formulating and applying. In the process of formulating, MF writes and states the mathematical aspects of real-world problems. MF is also able to use mathematical symbols to describe problems in mathematical form and determine the appropriate equation. In the process of applying, MF is able to plan and implement strategies and is able to apply concepts, rules, and mathematical facts to solve problems. However, the solution found by MF is not suitable due to an error in the calculation. This affects the interpreting process, MF concludes that the electricity capacity in Central Java is already higher than East Java.

These results indicate that female and male students fulfill all indicators of mathematical literacy in the process of formulating. Female students and male students have the ability to formulate problems well (Setiawan, Inganah, & Ummah, 2019). Both female and male students were able to meet the indicators in the process of applying, but there were still errors in the calculations. This shows that female students can apply

mathematical concepts and determine the correct solution (Setiawan, Inganah, & Ummah, 2019), while male students are able to apply mathematical concepts but are less thorough in finding solutions (Davita & Pujiastuti, 2020; Kadaritna, Rosidin, & Widyastuti, 2020). Female and male students were able to fulfill the indicators in the interpreting process. This shows that female and male students actually have good abilities in drawing conclusions (Hendiman, 2018; Davita & Pujiastuti, 2020; Kadaritna, Rosidin, & Widyastuti, 2020).

Based on this discussion, the following table presents the results and discussion of the AKM questions and interviews.

Table 5. Results and Discussion of AKM Questions and interviews

Literacy Indicator Mathematics	Female		Male	
	Subject AD	Subject SN	Subject HD	Subject MF
-Identify mathematical concepts and significant variables from real-world problems (Q1) -Describe the mathematical structure of the problem using symbols, appropriate variables, and diagrams (Q2)	Fulfil Q1 and Q2	Fulfil Q1 and Q2	Fulfil Q1 and Q2	Fulfil Q1 and Q2
-Design and implement strategies to get solutions to problems (R1) -Apply mathematical concepts, rules, and facts to help find solutions to problems (R2)	Fulfil R1 and R2	Fulfil R1 and R2	Fulfil R1 and R2	Fulfil R1 and R2, but there is still error in the calcula-tion
-Reinterpret calculation results from mathematical procedures in real-world contexts (S1)	Fulfil S1	Fulfil S1	Fulfil S1 at inter-view	Doesn't fulfil S1

CONCLUSION

Based on the analysis of the results of the completion and interview statements of the XII grade high school students, it can be concluded that subject 1 (high-ability female students) has fulfilled all the indicators in the process of formulating, implementing, and interpreting. Subject 1 wrote and mentioned the mathematical aspects and was able to change the statements in the problem into mathematical form. Subject 1 is also able to design strategies and apply mathematical concepts as well as draw conclusions in the context of the real world appropriately.

Subject 2 (medium ability female students) was able to fulfill the indicators in the process of formulating, implementing, and interpreting. Subject 2 writes down and mentions mathematical aspects and is able to change the statements in the problem into mathematical form. Subject 2 is also able to design and apply mathematical concepts. However, subject 2 is still not thorough in writing the solution so there are still parts that are not quite right. However, the conclusions written in the real world context are correct.

Subject 3 (high ability male students) has fulfilled all the indicators in the process of formulating, implementing, and interpreting. Subject 3 writes and mentions mathematical aspects and is able to change the statements in the problem into mathematical form. Students are also able to design strategies and apply mathematical concepts and draw conclusions. However, the conclusions drawn are not correct.

Subject 4 (male students with moderate ability) only met the indicators in the process of formulating and implementing. Subject 4 is able to write and mention mathematical aspects and is able to change the statements in the problem into mathematical form. Subject 4 is also able to design strategies and apply mathematical concepts but has not found the right solution. So that students can not draw conclusions correctly.

SUGGESTION

The researcher suggests that further research on mathematical literacy in solving AKM questions uses more research subjects and indicators so that the discussion can be described more deeply. Teachers are expected to be able to provide students with mathematical literacy-based exercises on a regular basis with the context of everyday life so that students are accustomed to solving literacy-based questions.

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