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Profile of Student Numerical Ability in Higher Order Thinking Skills (HOTS) Problem-Solving

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Abstract
The numeracy literacy of Indonesian students at the international level is still relatively low. This can be seen based on the results of the PISA test. In 2015, Indonesia obtained a PISA score of 386 for mathematics from each country's average score, namely 487. Low numeracy literacy can occur due to student errors in solving numeracy questions, namely conceptual and work procedure errors. Numerical Literacy is closely related to solving mathematical problems, primarily found in questions of the Higher Order Thinking Skills (HOTS) type. Therefore, no research examines numeracy skills in solving HOTS problems. This research uses a qualitative approach with a case study type. This study's subjects were class VIII MTs Negeri 5 Tulungagung students. This study used 2 data collection techniques: tests in the form of descriptions and interviews. The analysis model used is Miles and Huberman's model, which consists of data reduction, data display, and conclusion drawing/verification. The results of this study indicate that the level of numeracy ability of students at MTs Negeri 5 Tulungaguang is quite diverse, although, in percentage terms, those with moderate numeracy skills are more dominant. (1) Students with low numeracy abilities cannot fulfil all indicators of Numerical Literacy ability in solving problems, (2) Students with moderate numeracy ability can only fulfil three indicators of Numerical Literacy ability in solving problems, and (3) Students with high numeracy abilities can fulfil all indicators of Numerical Literacy ability in solving problems.

INTRODUCTION

Human Resources (HR) in the 21st century are required to master six basic literacy, including (1) language literacy, (2) numeracy literacy, (3) scientific literacy, (4) digital literacy, (5) financial literacy, and (6) cultural literacy and citizenship. Mastery of these six literacies can be balanced by developing critical thinking skills, creativity, communication, and problem-solving collaboration [1]–[4]. Numerical literacy is the ability to use numbers, data, and mathematical symbols, as well as knowledge and skills in making decisions related to real problems in everyday life [5]–[7]. There are three basic principles of numeracy literacy: (1) are contextual, by geographical and socio-cultural conditions; (2) are in line with the scope of mathematics in the

2013 curriculum; and (3) mutually beneficial and enriching other literacy elements [8]. There are several objectives of learning numeracy literacy for students as follows: (1) Sharpen and strengthen students' numeracy knowledge and skills in interpreting numbers, data, tables, graphs, and diagrams; (2) Apply numeracy literacy knowledge and skills to solve problems and make decisions in daily life based on logical considerations, and (3) Form and strengthen Indonesian human resources capable of managing natural resource wealth so that they can compete and collaborate with other nations for the prosperity and welfare of the nation and state [9].

The numerical ability has several indicators put forward by the Ministry of Education and Culture, namely (1) Ability to use various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of everyday life, (2) Ability to analyze the information displayed in various forms (graphs, tables, charts, diagrams), (3) The ability to interpret the results of the analysis to predict and make decisions, and (4) aspects of life [10]. Meanwhile, Munahefi [11] states that indicators of numeracy literacy skills are expressed as follows: (1) Using various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of everyday life, (2) Analyzing the information presented in various forms (graphs, tables, sections, diagrams), and (3) Interpret the results of the analysis to predict and make decisions.

The problem-solving ability is not only fundamental to problems related to mathematics; even complex-level issues can be found a solution if each masters these numeracy skills. Meanwhile, given Ashri & Pujiastuti [12], numeracy literacy is a student's reasoning ability. Reasoning means analyzing and understanding a statement by manipulating symbols or mathematical language in everyday life and expressing these statements through speech or writing.

However, the numeracy literacy of Indonesian students at the international level is still relatively low [5], [7], [13], [14]. This can be seen based on the results of the PISA test. In 2015, Indonesia obtained a PISA score of 386 for mathematics from the average score for each country, namely 487. Meanwhile, in 2018, the results of the PISA mathematics test in Indonesia decreased, namely 379, from an average score of 489 [15]. Based on this, it is essential to improve numeracy literacy skills to achieve qualified and competitive quality human resources.

On the other hand, Indonesia is also a country that has been active in Trends International Mathematics Science Study (TIMSS) activities since 1999. In the 2019 TIMSS activities, in mathematics, Indonesia obtained a score of 397, whereas the world TIMSS average score was 500 [16], [17]. Based on the results of the latest TIMSS and PISA studies, the low student learning outcomes can illustrate the low students' numeracy skills [18]. This can also be caused because students experience difficulties in terms of numeration [19]–[21].

Previous research found that students' mistakes in numeracy problem-solving were conceptual and work procedure errors [22], [23]. Numeration deals with solving mathematical problems. The idea of learning mathematics is problem-solving [24]. Problem-solving is a contextual problem in everyday life that requires reasoning. Numerical abilities are interrelated with solving or solving mathematical problems. Because the essence of mathematics learning is solving mathematical problems [25]–[27]. In this case, problem-solving is finding solutions to daily contextual problems that require reasoning. This is useful for stimulating humans to explore mathematical ideas, strengthen sense and relationships between concepts, and train perseverance and creativity in finding the right problem-solving strategy [28]. Questions with these problems can be found in the 2013 curriculum book with the HOTS type. Questions with the HOTS type require the involvement of higher-order thinking skills and reasoning processes to improve critical, logical, reflective, metacognitive, and creative thinking abilities [29].

To solve problems that are developed from questions that have a high level of difficulty, skills that involve numeracy literacy are needed, namely, the ability to use various kinds of numbers and symbols related to mathematics to solve problems in various contexts of everyday life, the ability to analyze the information displayed in various forms of graphs, tables, charts, diagrams, and so on, the ability to interpret the results of the analysis and predict the conclusions in making decisions. The indicators used in this study are (1) Using various numbers and symbols related to mathematics to solve problems in various contexts of everyday life, (2) Analyzing information displayed in various forms of graphs, tables, charts, and diagrams, and (3) Interpreting the results of the analysis and predicting the conclusions in making decisions.

Good math problems or problems can stimulate human cognition to explore mathematical ideas, strengthen reasoning and relationships between concepts, and train perseverance and creativity in finding appropriate problem-solving strategies [28]. Questions with these problems can be found in the 2013 curriculum book with the HOTS type. Questions with the HOTS type require the involvement of higher-order thinking skills and reasoning processes to improve critical, logical, reflective, metacognitive, and creative thinking abilities [29]. Therefore, no research examines numeracy skills in solving HOTS problems.

METHOD

This study uses a qualitative approach. According to Bogdan and Taylor, qualitative research produces descriptive data from people and observations [30]. The research type used is a case study, a series of scientific activities carried out in detail and intensively about a situation, event, and exercise at the individual and group levels to obtain in-depth knowledge about a case [31].

This study's subjects were class VIII students MTs Negeri 5 Tulungagung. The objects studied in this study were the answers to tests done by students and math questions made in the form of descriptions consisting of three problems. What will be analyzed from the students' test answers is how students' numeracy skills are in solving HOTS problems.

The data in this study were obtained from document analysis and interviews. The instrument used in this study is a form of description question. It should be noted that the results of student work are not used to assess student achievement but to find out how students' numeracy skills are in solving HOTS problems.

Data analysis was performed during and after data collection. Data analysis is intended to achieve research objectives. In this study, data analysis used Miles and Huberman's data analysis model [32]. The data analysis activities are data reduction, focusing on students whose answers refer to indicators of numeracy ability in solving HOTS problems, data display, and conclusion /verification [33].

RESULTS AND DISCUSSION

The research subjects in this study were 68 students who were asked to complete AKM questions containing three description questions. The results show that students' numeracy ability level at MTs Negeri 5 Tulungagung is quite diverse, even though those with moderate numeracy skills are more dominant in percentage terms. This is shown in Figure 1 below.

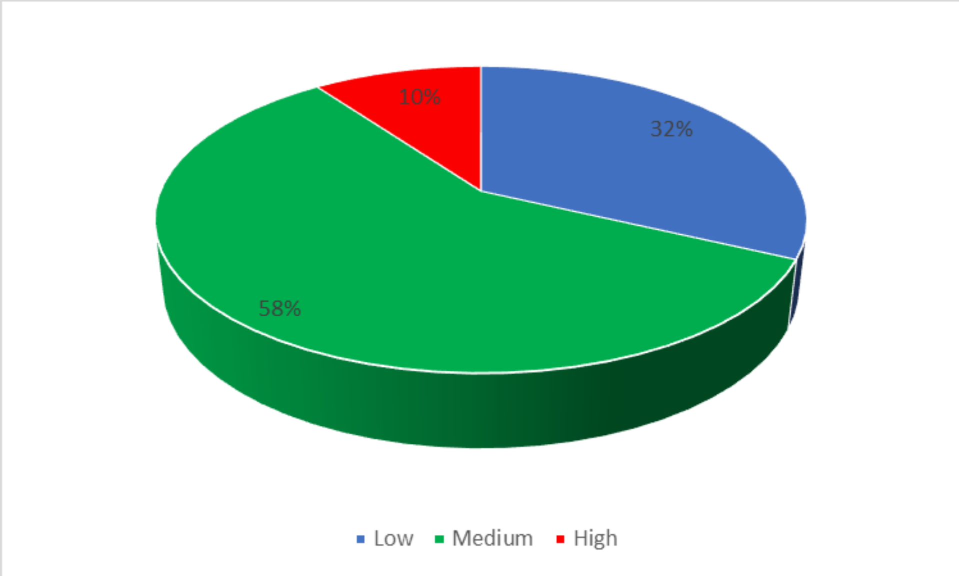


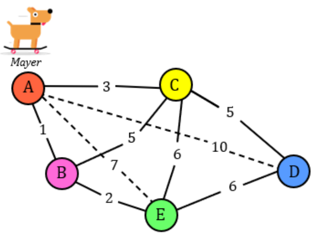
Figure 1. Percentage of Numeracy Ability of MTs Negeri 5 Tulugagung Students in Solving AKM Questions

Based on diagram 1 above shows that students belonging to the low level are 22 subjects, namely 32%. At the moderate level, there are 39 subjects, namely 58%, and at the high level, there are seven subjects, namely 10%. Thus, most subjects' numeracy skills in solving AKM questions were moderate. Several factors resulted in the issue experiencing difficulties in solving problems, among others: lack of understanding of the problem, meaning lack of knowledge of what are the prerequisites and what is the target of the questions, lack of accuracy in reading what is intended in the problem, including not being thorough in carrying out the algorithm and not being able to solve or find the desired answer.

To reveal the profile of the subject's numeracy ability in solving problems, three issues were given problems classified as HOTS-level questions. The problems presented are as follows:

Problem 1. Travel Route

One day, Syaiful was walking around several points. Syaiful's travel route is shown in the image below.



There are 5 points where Syaiful stops, namely points A, B, C, D, and E. To reach specific points, Mayer spends energy equivalent to the number shown in the picture.

To illustrate, Mayer wants to reach point B from point A. The route to B requires one energy. From point B to point E, it requires two energy. So, if Mayer walks from A to B, then to E, he spends three energy. This route can be written as ABE.

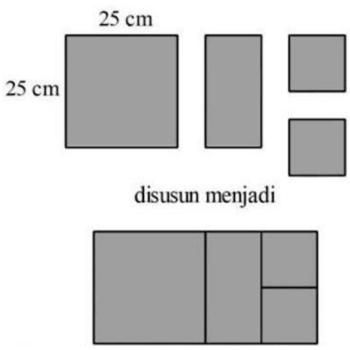
Currently, Syaiful is at point A, armed with x energy. If Mayer then goes the ABCADE route, and all that remains is seven energies, Mayer's initial total energy will be... energies.

Problem 2. Performance Hall

In a theatre, there are nine rows of seats. The first row has eight seats. The second row has 12 seats. The third row has 11 seats, the fourth row has 15 seats, the fifth row has 14 seats, and so on, following the same pattern.
How many seats are in the back row?

Problem 3. Home Page

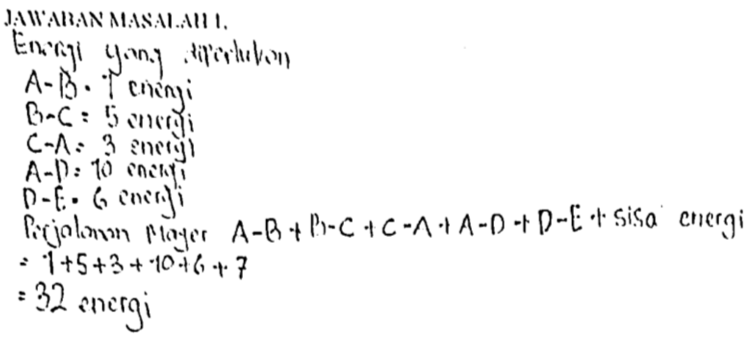
The following is a photo of Pak Rahmat's yard measuring $10\ m \times 10\ m$.
It can be seen that the arrangement of rectangular stones and two small square rocks is the same size as the large rectangular stones $25\ cm\ \times 25\ cm$.



Which of the following statements regarding the arrangement of natural stones in Mr. Rahmat's yard are true?

a. Small square stones are used more than large square stones
b. If 80 large square rocks are provided, it will be enough to cover the entire yard
c. The number of large square stones equals the number of rectangular stones
d. The area of the whole of the small square stone is a quarter of the size of the yard

Furthermore, the selection of subjects was carried out by purposive sampling, namely for each category, namely one issue with a low level of numeracy ability (SNR), one matter with a medium level of numeracy ability (SNS), and one subject with a high level of numeracy ability (SNT). The selection of issues based on this level is intended to meet student representation in the class. Data was also collected through task-based tests and interviews (AKM question tests) designed to contain literacy elements. The description of the subject with low numeracy ability (SNR) is presented below.



Based on the data findings in Figure 2. SNR writes down the energy required from point A to B, namely one energy, from point B to C, namely five energy; from point C to A, namely three energy; from point A to D, namely ten energy; from point D to E, is six energies. Furthermore, SNR writes that Mayer's energy is the energy used for the trip plus the energy side equal to 32 energies. Mayer's trip, namely A to B To C To A to D to E, with total energy $of\ 1+5+3+10+6 to\ produce\ 32\ energy;\ the\ remaining\ energy\ is\ 7$. Following are the results of SNR interviews in solving problem 1.

P	:	*What do you understand in this problem 1?*
SNR	:	*It is known how much energy is required to travel between points* *A – B = 1 energy* *B – C = 5 energies* *C – A = 3 energies* *A – D = 10 energies* *D – E = 6 energies* *Moreover, I asked about Mayer's initial total energy when he travels from A – B – C – A – D – E and has seven points left.*
P	:	*Okay. So, how do you solve this one problem?*
SNR	:	*Well, I sum up all* $1+5+3+10+6+7=32$*energy*
P	:	*OK great*

From the results of tests and interviews, it was shown that SNR was able to understand problem 1. Subjects used numbers or symbols to determine travel routes, such as "AB, BC, and so on, so SNR could turn sentences into characters and change contextual problems into number formulas and mathematical symbols. SNR makes a solution strategy. Namely, Mayer's total energy equals the energy spent on the trip plus the remaining power, so SNR can develop a solution strategy by determining the right formula to solve the problem. SNR displays the answer with a mathematical algorithm procedure, in this case, addition and subtraction, to find the appropriate response, namely 32 energy due to $1+5+3+10+6+7=32$ energy so that SNR can determine the solution to the problem. Next, the following is a description of the SNR test results in problem 2:

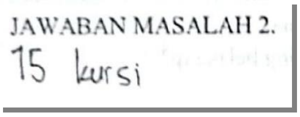


Figure 3. SNR Solving Results in Problem 2

Figure 3, the SNR only directly answers problem 2, namely 15 seats. Following are the results of SNR interviews in solving problem 2.

P	:	*What do you understand about these two problems?*
SNR	:	*The building has nine rows of seats* *1st row = 8 seats* *2nd row = 12 seats* *3rd row = 11 seats* *4th row = 15 seats* *5th row = 14 seats* *Moreover, what is asked is the number of seats in the back row or the 9th row.*
P	:	*Okay. So, how do you solve these two problems?*
SNR	:	*I am confused*
P	:	*Why?*
SNR	:	*It should be getting back more and more, but this is not.* *The 2nd row has 12 seats, but how come the 3rd row has 11?*

		So I just answered 15 seats.
P	:	*Oh. Then why don't you find a pattern?*
SNR	:	*I am confused*
P	:	*Ok, it is all right.*

The results of the tests and interviews showed that SNR understood problem 2. SNR's understanding of problem two was demonstrated during the interview " *1st row = 8 seats; 2nd row = 12 seats; 3rd row = 11 seats; 4th row = 15 seats; 5th row = 14 seats; And what was asked was the number of seats in the rear row or the 9th row* ", but SNR did not know what steps to take next, he said "I a*m confused* " SNR assumed that the more backward, the more seats but not in the 3rd row 11 which seats in the 2nd row 12 seats. According to SNR's experience, the seat goes back as much as possible, but not in this matter. The subject loses other strategies to determine the pattern or is desperate to find a solution. Thus, issues with low numeracy skills cannot display information in diagrams or pictures, so they cannot predict making the right decisions. Next are the results of the SNR test in problem three as follows:

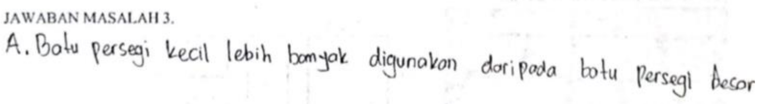


Figure 4. SNR Solving Results in Problem 3

From Figure 4.4, the SNR only answers directly to the correct problem-3 statement, namely statement A. Small square stones are used more often than large square stones. Following are the results of SNR interviews in solving problem 3.

P	:	*What do you understand in these three problems?*
SNR	:	*It is known that the garden size* $10\ m \times 10\ m$*contains stones with such an arrangement.* *One sizeable square stone equals two small square stones and one rectangular stone.* *What is being asked is which statements A to D are factual.*
P	:	*Okay. So, how do you solve these three problems?*
SNR	:	*A*
P	:	*Why?*
SNR	:	*One large square equals two small squares plus one rectangle, so regardless of the garden area, there are more small square stones than rectangular stones.*
P	:	*Ok. So what else? Is there still an accurate statement?*
SNR	:	*Do not know*
P	:	*Why?*
SNR	:	*I am confused about checking the others, and if A is correct, that is it.*
P	:	*The question is, "Which of the following statements are true?" so maybe more than 1 statement is true.*
SNR	:	*Yes, but I am already confused.*
P	:	*Ok, it is all right.*

Based on the results of the tests and interviews, it showed that the SNR in problem 3 understood the problem with the reasons during the interview, " *It is known that there are stones in a garden* $ten\ m \times 10\ m$ *with such an arrangement. 1 large square stone is equal to 2 small square stones and one rectangular stone* "anything you ask" *which of the following statements are true?* the subject answered," *only statement A is true".*

SNR assumes that if there is already one correct answer, then it is enough, and because the other statements are complex to check, as expressed, " *I am confused about checking the others, and if A* *is correct, that is it"*. Thus, the subject cannot show or display his analysis in pictures, graphs, or charts and is wrong in interpreting and predicting the right decision.

Based on the research results of students with low numeracy skills, it is known that students with soft numeracy skills can only solve problem 1. These students can change contextual issues into mathematical formulas and symbols, identify information, devise a solution strategy, and determine the proper procedure to solve the problem and get the correct solution.

However, in problems 2 and 3, students with low numeracy abilities cannot turn sentences into symbols and cannot change contextual issues into number formulas and mathematical symbols, cannot develop solving strategies, cannot determine the proper procedure to solve problems, cannot use diagrams, tables, pictures to find solutions, cannot interpret the conclusions of the problem, cannot determine the key to the problem, and cannot conclude. This is the opinion of Khafifah, who states that students with low numeracy skills can only solve questions with closed and common characteristics.

Students with low numeracy skills have difficulty interpreting increasingly complex problems. He had trouble choosing and determining what concept to use. After finding the idea to be used, students also experience obstacles in implementing the image in the problem and the calculations. The problem-solving strategy chosen is often not right on target, so students need a relatively long time to solve problems. Ramirez [34] revealed that most students had difficulty translating the issues posed because the characteristics of mathematical numeracy literacy questions adopted PISA questions containing context in each question, while students were used to solving questions with closed features and routine. Besides that, knowledge of mathematics is not enough to make someone have numeracy skills. When everyday problems are often unstructured, have many ways of solving, or even no complete solution, and are related to non-mathematical factors, at the same time, numeracy literacy is needed.

Furthermore, on subject 2, namely SNS with moderate numeracy skills, they are as follows:

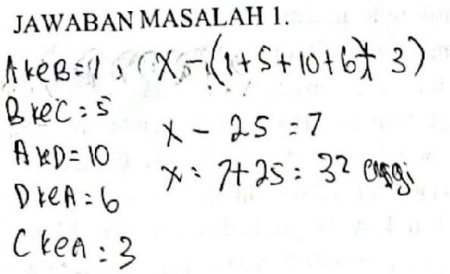


Figure 5. SNS Completion Results in Problem 1

From Figure 5, the SNS writes the energy required from point A to B, namely one energy, from point B to C, namely five power; from point A to D, namely ten energy; from point D to A, namely six significance, from point C to A, namely three energy. Next, SNS writes down the symbol x, namely Mayer's total energy, and subtracts it from the amount of energy written, $x-(1+5+10+6+3)$ equal to the remaining power. SNS continues $x-25=7$. So $x=7+25=32$ energy. Following are the results of SNS interviews in solving problem 1.

P	:	*What do you understand in this problem 1?*
SNS	:	*It is known how much energy is required to travel between points* *A – B = 1 energy* *B – C = 5 energies* *C – A = 3 energies* *A – D = 10 energies* *D – E = 6 energies* *Moreover, I asked about Mayer's initial total energy when he travels from A – B – C – A – D – E and has seven points left.*
P	:	*Okay. So, how do you solve this one problem?*
SNS	:	*I suppose the initial energy is* x *then reduced by the amount of energy required from A – B – C – A – D – E equal to the remaining power, so* $x-(1+5+10+6+3)=7$ $x-25=7$ $x=7+25=32$ *energy*
P	:	*OK great*

Based on the results of tests and interviews, it was shown that subjects with moderate numeracy skills were able to understand and solve problem 1. Subjects used numbers or symbols in determining travel routes such as "A to B, B to C, and so on, expressed by A - B = 1, B - C = 5, and so on, and exemplify the initial total energy with symbols $x$so that SNS can turn sentences into characters and can change contextual problems into number formulas and mathematical symbols. SNS makes a solution strategy with the initial energy minus the energy needed from A - B - C - A - D - E equal to the remaining power. SNS can develop a solution strategy by determining the right formula to solve the problem.

SNS displays the answer with a mathematical algorithm procedure, in this case, addition and subtraction, to find the appropriate response, namely $x-(1+5++10+6+3)=7$, then $x-25=7$. So that the conclusion is obtained$x=7+25=32$ energy, SNS can determine the problem's solution, draw conclusions, and interpret them. Furthermore, the following are the test results from SNS subjects in problem 2:

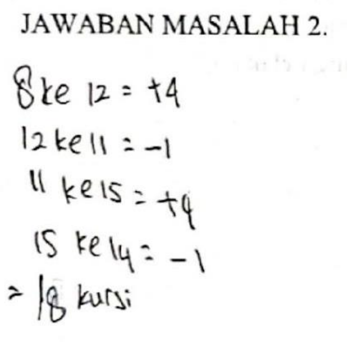


Figure 6. SNS Completion Results in Problem 2

Figure 6, SNS looks for a pattern of the number of seats in each row. The first row is 8, and the second is 12, so the number of seats is increased by 4. The second row is 12, and the third is 11, so the number of seats is reduced by 1. And so on, from 11 to 15 $=+4$, 15 to 14

$= -1$. Furthermore, SNS answered problem 3 with 18 seats $14 + 4$. The following are the results of SNS interviews in solving problem 2.

P	:	*What do you understand about these two problems?*
SNS	:	*The building has nine rows of seats* *1st row = 8 seats* *2nd row = 12 seats* *3rd row = 11 seats* *4th row = 15 seats* *5th row = 14 seats* *And what is asked is the number of seats in the very back row*
P	:	*Okay. So, how do you solve these two problems?*
SNS	:	*I am looking for a pattern* *From the 8th to the 12th* $+4$ *From the 12th to the 11th* -1 *From the 11th to the 15th* $+4$ *From the 15th to the 14th* -1 *So that next time* $+4$, *it will be* $14 + 4 = 18$ *chair*
P	:	*Is it like that?*
SNS	:	*Yes*
P	:	*Try to see again what is asked.*
SNS	:	*Lots of seats in the back row. Oh yes, there are nine lines* *Excuse me, sir,*
P	:	*Ok, it is all right. Try continuing*
SNS	:	*So* $18 - 1 = 17$ $17 + 4 = 21$ $21 - 1 = 20$ *20 seats sir*
P	:	*OK great*

The results of tests and interviews showed that SNS understood the problem but could not find the right solution. It can be seen that the subject understands the situation given, according to him, " *It is known that the building has nine rows of seats; 1st row = 8 seats; 2nd row = 12 seats; 3rd row = 11 seats; 4th row = 15 seats; 5th row = 14 seats; And what was asked was many seats in the back row."* The subject had found the pattern, as stated in the interview "I a*m looking for the design; From the 8th to the 12th* $+4$*; From the 12th to the 11th* -1*; From the 11th to the 15th* $+4$*; From the 15th to the 14th* -1*; So that the next one* $+4$ *becomes* $14 + 4 = 18$ *a chair.*

However, SNS could not find a solution. SNS only looked for the number of seats in the next row, row 6, because he forgot that what was being asked was the number of seats in the back, row 9. Thus, subjects with numeracy skills understood the problem and could analyze the information well to find patterns to find solutions and predict conclusions. It is just that I was not focused and thorough about the desired target of the question. Furthermore, here are the results of the SNS subject test on the third problem:

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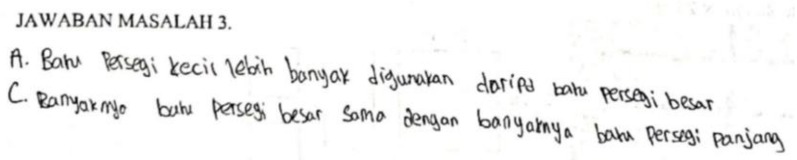

Figure 7. SNS Completion Results in Problem 3

From Figure 4.7, the SNS immediately answers the correct statement in problem 3, namely statement A, that is, small square stones are used more often than large square stones, and Statement C, the number of large square stones is the same as the number of rectangular stones. Following are the results of SNS interviews in solving problem 3.

P	:	*What do you understand in these three problems?*
SNS	:	*It is known that the garden size* $10\ m \times 10\ m$*contains stones with such an arrangement.* *One sizeable square stone equals two small square stones and one rectangular stone.* *What is being asked is which statements A to D are factual.*
P	:	*Okay. So, how do you solve these three problems?*
SKNS	:	*A and C*
P	:	*Why?*
SKNS	:	*It is clear that one large square equals two small squares plus one rectangle, so no matter how big the garden is, there are more small square stones than rectangular stones, and large square stones equal many rectangular rocks.*
P	:	*Ok. So what else? Is there still an accurate statement?*
SKNS	:	*Do not know*
P	:	*Why?*
SKNS	:	*I am confused. Check the others*
P	:	*Ok, it is all right.*

Showed $10\ m \times 10\ m$that SNS understood the problem. *What is being asked is which statements A to D are factual.* SNS tries to find reasons to determine which statement A to statement D is correct. According to him, at a glance, the correct ones are A and C, because "It i*s clear that one large square is equal to 2 small squares plus one rectangle so that regardless of the area of the garden, there must be many small square stones more than rectangular stones, as well as the same number of large square stones. With many rectangular stones,*" when asked if any other statement is true? The subject replied, "I a*m confused to check the others* ". Thus, SNS has difficulty in providing arguments and predicting in making decisions.

Based on the research results of students with moderate numeracy abilities, it is known that students with sensible numeracy abilities can solve problem 1. In contrast, concern two students with average numeracy abilities carried out the procedure well, but in answering this, students did not write the answers correctly because they were not thorough. In problem three as well.

Students with moderate numeracy ability cannot turn sentences into symbols, change contextual problems into formulas of numbers and mathematical symbols, devise solutions strategies, determine the correct procedure to solve problems, cannot use diagrams, tables, or pictures to find solutions or interpret the conclusions of the problem, unable to determine the answer to the problem, and unable to conclude. Matter This is the opinion of Asmara [35], who concluded that students with moderate numeracy abilities could not fully answer with him, sometimes being inaccurate and doubtful whether the answers he wrote were right or wrong.

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Furthermore, subject 3, namely SNT with high numeracy abilities, is as follows:

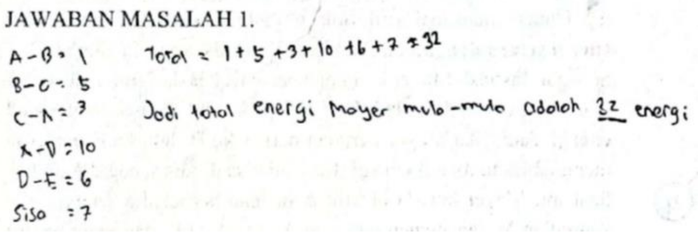

JAWABAN MASALAH 1.
A - B = 1
B - C = 5
C - A = 3
A - D = 10
D - E = 6
Sisa = 7
Total = 1 + 5 + 3 + 10 + 6 + 7 = 32
Jadi total energi Mayer mula-mula adalah 32 energi

Figure 8. SNT Completion Results in Problem 1

From Figure 4.8, SNT writes the energy required from point A to B, namely one energy, from point B to C, namely five power; from point C to A, namely three power; from point A to D, namely ten energy, from point D to E, namely six energy, and the remaining seven energy. Furthermore, STS added everything, namely 1 + 5 + 3 + 1 0 + 6 + 7 = 32, so STS concluded that Mayer's initial total energy was 32. Following are the results of SNT interviews in solving problem 1.

P	:	*What do you understand in this problem 1?*
SNT	:	*It is known how much energy is required to travel between points* *A – B = 1 energy* *B – C = 5 energies* *C – A = 3 energies* *A – D = 10 energies* *D – E = 6 energies* *Moreover, I asked about Mayer's initial total energy when he travels from A – B – C – A – D – E and has seven points left.*
P	:	*Okay. So, how do you solve this one problem?*
SNT	:	*Well, I sum up all* $1 + 5 + 3 + 10 + 6 + 7 = 32$*energy*
P	:	*OK great*

The results of the tests and interviews show that SNT can understand the problems given, as stated: " *It is known that the amount of energy needed to travel between points A - B = 1 energy; B – C = 5 energy; C – A = 3 energies; A – D = 10 energies; D – E = 6 energy"* The subject also knows the problem, " *asked the initial total energy that Mayer had when he travelled from A – B – C – A – D – E and had seven energy left", this means that the* subject able to use symbols and numbers as needed. SNT can develop strategies and use them to determine solutions by adding up all the required energy " Yes, I add up everything. That is energy", meaning that SNT concludes a solution and interprets the analysis results. Next, the results of the SNT subject test in problem 2 are as follows:

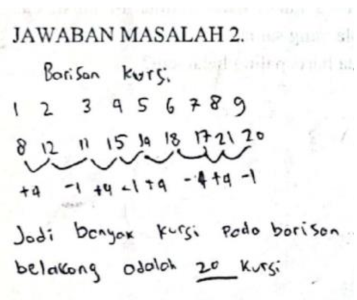


Figure 9. SNT Completion Results in Problem 2

Figure 9, SNT writes down the number of rows of seats, then SNT writes down the number of seats in each row and looks for a pattern for the number of seats in each row. The first row is 8; the second row is 12, so the number of seats is increased by 4. The second row is 12, and the third is 11, so the number of seats is reduced by 1. And so on, from 11 to 15 $= +4$, 15 to 14 $= -1$. Furthermore, the SNS writes the following pattern in the 6th row $14 + 4 = 18$, 7th row $18 - 1 = 17$, 8th row $17 + 4 = 21$, and 9th row $21 - 1 = 20$, so the SNS concludes the answer to problem 3 with 20 responses. The following are the results of the SNS interview in solving problem 2.

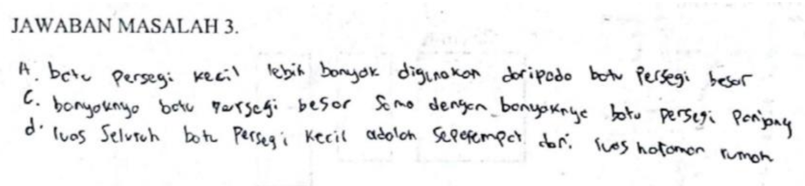
P	:	*What do you understand about these two problems?*
SNT	:	*The building has nine rows of seats* *1st row = 8 seats* *2nd row = 12 seats* *3rd row = 11 seats* *4th row = 15 seats* *5th row = 14 seats* *And what is asked is the number of seats in the very back row*
P	:	*Okay. So, how do you solve these two problems?*
SNT	:	*I am looking for a pattern with pictures* *From the 8th to the 12th* $+4$ *From the 12th to the 11th* -1 *From the 11th to the 15th* $+4$ *From the 15th to the 14th* -1 *Until next* *The 6th row has* $14 + 4 = 18$ *seats* *Row 7 has* $18 - 1 = 17$ *seats* *The 8th row has* $17 + 4 = 21$ *seats* *Row 9 has* $21 - 1 = 20$ *seats*
P	:	*OK great*

Based on the test and interview results, it was found that subjects with high numeracy skills were able to understand the questions. The issues wrote down what was known " *It is known that the building has nine rows of seats; 1st row = 8 seats; 2nd row = 12 seats; 3rd row = 11 seats; 4th row = 15 seats; 5th row = 14 seats"* Subjects can also determine what is asked, " *what is asked about the number of seats in the back row"* Subjects can analyze the information provided by paying attention to patterns by drawing " *I look for ways.*

From the 8th to the 12th $+4$

From the 12th to the 11^{th} -1
From the 11th to the 15^{th} $+4$
From the 15th to the 14^{th} -1
Until next
The 6th row has $14 + 4 = 18$ *seats*
Row 7 has $18 - 1 = 17$ *seats*
The 8th row has $17 + 4 = 21$ *seats*
Row 9 has $21 - 1 = 20$ *seats*

So that SNT can devise a solution strategy and use it to determine solutions to problem 2, SNT also can analyze information in the form of pictures and patterns. Next are the results of the SNT subject test on problem 3."


JAWABAN MASALAH 3.

A. batu persegi kecil lebih banyak digunakan daripada batu persegi besar
C. banyaknya batu persegi besar sama dengan banyaknya batu persegi panjang
d. luas seluruh batu persegi kecil adalah seperempat dari luas halaman rumah

Figure 10. SNT Completion Results in Problem 3

Figure 10, SNT immediately answers the correct statement in problem 3: statement A: small square stones are used more often than large square stones. Statement C, the number of large square stones, is the same as the number of rectangular stones, and statement D, the area of all small square stones, is a quarter of the yard area. Following are the results of SNS interviews in solving problem 3.

P	:	*What do you understand in these three problems?*
SNT	:	*It is known that the garden size* $10\ m \times 10\ m$*contains stones with such an arrangement.* *One sizeable square stone equals two small square stones and one rectangular stone.* *What is being asked is which statements A to D are factual.*
P	:	*Okay. So, how do you solve these three problems?*
SNT	:	*A, C, and D*
P	:	*Why?*
SNT	:	*Statements A and C are clear because one large square equals two small squares plus one rectangle, so regardless of the garden area, there must be more small square stones than rectangular stones, and large square stones equal many rectangular rocks.* *Statement B is incorrect because* $\frac{10\ m \times 10\ m}{25\ cm \times 25\ cm} = \frac{1000\ cm \times 1000\ cm}{25\ cm \times 25\ cm} = 40 \times 40 = 1600$*the stone is a large square* *Statement D is true because one large square stone equals four small square stones, so the area of all small square stones equals a quarter of the yard area.*
P	:	*Ok. Good*

Based on the results of the tests and interviews, it was shown that SNT could understand the problem "*It is known that a garden of the same size* $10\ m \times 10\ m$*contains stones in such an arrangement. One large square stone equals two small square stones and one rectangular stone. The question is asked which statements A to D are true"* and the subject can provide arguments about the decisions taken. The issue gave the idea, " *Statements A and C are* ***clear*** *because one large square is equal to 2 small squares plus one rectangle so that regardless of the area of the garden, there must be many small square stones more than rectangular stones, as well as many large square stones, equal many stones rectangle.*

Statement B ***is wrong*** *because* $\frac{10\ m \times 10\ m}{25\ cm \times 25\ cm} = \frac{1000\ cm \times 1000\ cm}{25\ cm \times 25\ cm} = 40 \times 40 = 1600$ *the stones* are *square*. Thus, SNT can devise a solution strategy to determine solutions to problem 2. SNT also can analyze information in the form of images.

Based on the research results of students with high numeracy skills, it is known that students with high numeracy skills can solve problems 1, 2, and 3 well. This is the opinion of Kafifah [36], who said that students with high abilities are better because they can do calculations and correctly identify questions.

Students with high numeracy skills can turn sentences into symbols, change contextual problems into formulas of numbers and mathematical symbols, devise solution strategies, determine the proper procedure to solve problems, can use diagrams, tables, and pictures to find solutions, can interpret the conclusions of situation, can determine the resolution of the issue, and can draw conclusions.

Asmara [35] revealed that students with high abilities are also used to answering questions in context, identifying information, solving problems with clear instructions, and giving good reasons for these answers. Students with high abilities are also getting used to working on procedures that require sequential decisions, solving problems with simple strategies, interpreting and using representations based on different sources of information, and presenting the results of their interpretations.

CONCLUSION

Based on the results of research that have been done, the level of numeracy ability of students at MTs Negeri 5 Tulungaguang is quite diverse, even though, in percentage terms, those with moderate numeracy skills are more dominant. (1) Students with low numeracy abilities cannot turn sentences into symbols, cannot change contextual problems into mathematical formulas and symbols, cannot develop strategies for solving problems, cannot determine the right formula to solve problems, cannot use diagrams, tables, pictures to find solutions, unable to interpret conclusions from problems, unable to determine solutions to problems, and unable to draw conclusions, (2) Students with moderate numeracy abilities cannot turn sentences into symbols, can change contextual problems into formulas of numbers and mathematical symbols, can develop a solution strategy, can determine the right formula to solve the problem, cannot use diagrams, tables, images to find solutions, cannot interpret the conclusions of the problem, cannot determine solutions to problems, and cannot draw conclusions, and (3) Students with high numeracy skills can turn sentences into symbols, can change contextual problems into mathematical formulas and symbols, can develop strategies for solving problems, can determine the right formula to solve problems, can use diagrams, tables, pictures to find solutions, can interpret conclusion of the problem, can determine the solution of the problem, and can draw conclusions.

Therefore, it is suggested that a teacher should direct learning that fosters numeracy literacy skills for students. The approach, the model set as a stimulus, should be contextual and attract students' attention to be more curious about students. Besides, training students to be familiar

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with questions about the HOTS type is necessary. This also includes media and learning resources to develop mathematical numeracy literacy skills for students and teachers. A learning approach suitable for students will make them trained and accustomed to solving literacy and numeracy problems efficiently.

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