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Analysis of Computational Thinking Skills of Vocational School Students Based on Mathematical Literacy Skills in the Society 5.0 Era

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Abstract

Computational thinking skills are important and need to be developed in the 21st century. This study aims to describe the computational thinking ability of vocational school students based on mathematical literacy skills in the era of society 5.0. This research uses a qualitative descriptive method. This research was carried out at SMKN 1 Gunung Putri with research subjects namely students in grades XI RPL 1 and XI RPL 2 totaling 66 students. From the research subjects, 3 students were selected who had high, medium, and low mathematical literacy skills. The data collection technique was carried out using CT ability tests and CT ability interviews. The data analysis techniques used are data reduction, data presentation, and conclusion drawing. This study shows that overall students' computational thinking skills are still relatively low because they have not mastered and applied all the indicators to the maximum. In students with high mathematical literacy skills, able to involve decomposition indicators, pattern recognition, algorithmic thinking, abstraction and generalization in type 1 and 2 problems. Students with medium mathematical literacy skills are able to involve decomposition indicators, pattern recognition, and algorithmic thinking in type 1 and 2 problems. Students with low mathematical literacy skills, able to involve decomposition indicators and pattern recognition in type 1 and 2 problems, as well as algorithmic thinking indicators only in type 2 problems.

Keywords: Computational thinking skills, mathematical literacy, era of society 5.0

1. Introduction

In the 21st century, the existence of technology is developing so rapidly, the transformation of advanced technology has given significant changes to various dimensions of human life, including education. Education plays an important role in supporting the need for a qualified and globally competitive workforce (Mustaqimah & Ni'mah, 2024). This requires the community to always continue to develop their skills and knowledge in line with the progress of science and technology in this century. The era of the industrial revolution 4.0 was first introduced as a change in the industry regarding the overall production process including the use of internet networks and digital technology (Indarta et al., 2022). The industrial revolution is a change in other fields, especially education and society, triggered by major changes in technology (Putriani & Hudaidah, 2021).
Not long after, the public was again shocked by the emergence of a new era triggered by Japan, namely society 5.0. This era is an era of civilization where the main source is in humans and

activities with technology that applies the concept of big data to be diverted by artificial intelligence into a benefit for human life (Puspitasari et al., 2022). The integration of technology is one of the important things in the era of society 5.0 which is emphasized to all aspects of human life including education. The existence of technology in the field of education provides many benefits, including 1) the increasing availability of student learning resources that can be accessed on the internet through websites or learning platforms, 2) the implementation of an effective and efficient learning process through technological devices such as LCD projectors and laptops, 3) the interest and enthusiasm of students in learning is increasing, and 4) the creation of flexibility in the learning process (Raihan & Nurzalkinah, 2024).

The era of society 5.0 allows the fulfillment of human needs for modern science through artificial intelligence so that humans can live comfortably (Indarta et al., 2022). In this era, human skills and abilities can be developed by taking advantage of existing technological developments (Maghfiroh & Sholeh, 2022). There are several competencies that every human must have in the era of society 5.0, one of which is IT Literacy. IT literacy is an important part of mental flexibility, which is the brain's ability to change thoughts to other things when faced with different work-related conditions (Mursyidah et al., 2023). Through IT literacy, humans must be capable of comprehending algorithms and the computer thought process, or in other words known as computational thinking.

Computational thinking ability is the ability of students to describe mathematical knowledge to be formulated into computer language so that students can dynamically model mathematical concepts and relationships (Mustaqimah & Ni'mah, 2024). In simple terms, computational thinking ability is interpreted as the ability of students to facilitate the final solution process by transforming problems into simpler structural forms (Kawuri et al., 2019). Problem-solving abilities that are connected to literacy, communication, creativity, and critical thinking are known as computational thinking abilities.

Computational thinking skills have four indicators including decomposition, pattern recognition, algorithmic thinking, abstraction and generalization. With these four indicators, students can be trained to get used to formulating existing problems by dividing the problem into the smallest parts that are easy to solve. Computational thinking is thought to be one of the most important skills in the twenty-first century as, when students solve problems, they should focus on how they arrive at solutions rather than merely solving the problem itself (Masfingatin & Maharani, 2019).

In the world of work, many fields are influenced and depend on computational thinking skills (Cansu & Cansu, 2019). Through computational thinking, students can maximize the skills required in the world of work and progress in an environment that cannot be systematically predicted. Therefore, computational thinking skills can be referred to as an important ability to be developed in the 21st century. The relevance of computational thinking abilities in the twenty-first century is negatively correlated with actual reality, at the moment Indonesian students have comparatively low computational thinking abilities, as evidenced by the results of several researcher's literature reviews on previous research at the high school level, namely junior high school/equivalent and high school/equivalent, it was found that computational thinking skills in general still do not reach the set KKM value (Kamil et al., 2021; Lestari & Roesdiana, 2023) therefore, low computational thinking skills are also found in research (Jamna et al., 2022; Lubis & Yahfizham, 2024) whose students not been able to satisfy every indicators.

In addition to the competencies that must be possessed by every human being in the *society* 5.0 era, in the field of education there are 3 main characteristics needed to answer this era, including attitude competence, knowledge and literacy (Noviyana & Sugianti, 2024). Literacy has a wide dimension, one of which is mathematical literacy which plays an important role in human life. The capacity to comprehend and apply mathematics as beneficial in everyday life is known as mathematical literacy (Hairunnisah, 2019). Mathematical literacy is the degree to which an individual can apply mathematical concepts, methods, facts, and tools to explain and translate a reality they have experienced. Eventually, it is intended that students would be able to comprehend and formulate mathematics under a variety of circumstances. The PISA assessment includes questions about mathematical literacy.

In 2021, the PISA framework redefined mathematical literacy skills by taking into account the rapid development of technology (Maxrizal et al., 2023). As a result, mathematical literacy skills have a relationship with computational thinking skills because the assessment aspect of computational thinking in the PISA 2021 framework is part of aspects of mathematical literacy. Students that possess computational thinking abilities are able to dynamically represent mathematical relationships and concepts (Zahid, 2020). So, students are required to show their computational thinking skills when solving problems by applying mathematical knowledge (Islami, 2023). If you look at the results of some of the researcher's literature review of previous research that has been explained, it is found that there has been no discussion about how the computational thinking ability of vocational school students is based on mathematical literacy skills. The selection of vocational school students as research subjects is due to the frequent use of digital objects and programming languages in today's society, moreover in the Vocational School majoring in Software Engineering, they learn about computer programming by involving computer thinking processes and algorithms in their learning. Therefore, this study descriptively examines how the computational thinking ability of vocational school students based on mathematical literacy skills in the society 5.0 era.

2. Methods

This study uses a qualitative descriptive approach to describe the computational thinking ability of vocational school students based on mathematical literacy skills in the era of society 5.0. This research was carried out at SMKN 1 Gunung Putri using a population of 66 students in class XI Software Engineering 1 and XI Software Engineering 2. The subjects of the study used were 3 students representing each category of mathematical literacy skills, this is done to speed up the data collection procedure and save time, as researchers are only given limited time to conduct research in schools on certain days according to the math teacher's teaching schedule. Data were collected by mathematical literacy tests, computational thinking tests, and interview guidelines. The mathematical literacy test is measured using the Minimum Competency Assessment questions which amount to 3 questions, with the indicators used are formulating mathematical situations, applying mathematics, and interpreting the results of the solution. The computational thinking ability test is measured using 3 bebras task questions, the computational thinking ability test is carried out twice with 2 types of questions whose question patterns are the same, only different numbers. The indicators of computational thinking ability in this study are decomposition, pattern recognition, algorithmic thinking, abstraction and generalization (Mubarokah et al., 2023). Before being tested on students, this computational thinking ability test was first tested for validity and reliability to 1 lecturer, 1 teacher, and 40 students with the following results:

Table 1

Results of Testing for The Validity of Computational Thinking Ability Instruments

Item Number	r_{count}	r_{table}	Description
1	0,926	0,312	Valid
2	0,811	0,312	Valid
3	0,622	0,312	Valid

The findings of the computational thinking ability test instrument's validity test are shown in Table 1 and are deemed valid since they satisfy the following criteria: $r_{count} > r_{table}$. Miles and Huberman's guidelines for data reduction, data presentation, and conclusion drawing were followed in this study (Sugiyono, 2019).

3. Result and Discussion

Mathematical literacy test data was processed using a rasch model with WinStep. The study of the 66 students' results from the mathematical literacy ability test reveals that 2 students with high category mathematical literacy skills, 53 students with medium category, and 11 students with low category. Then, from each category, 1 student was selected according to the results of the test of mathematical literacy, so that 3 students were selected as follows:

Table 2

Mathematical Literacy Test Scores

Student	Category	Code	1	2	3	Total score
26P	High	E	10	7	7	24
35P	Medium	SNH	8	5	6	19
01L	Low	MRA	3	4	4	11

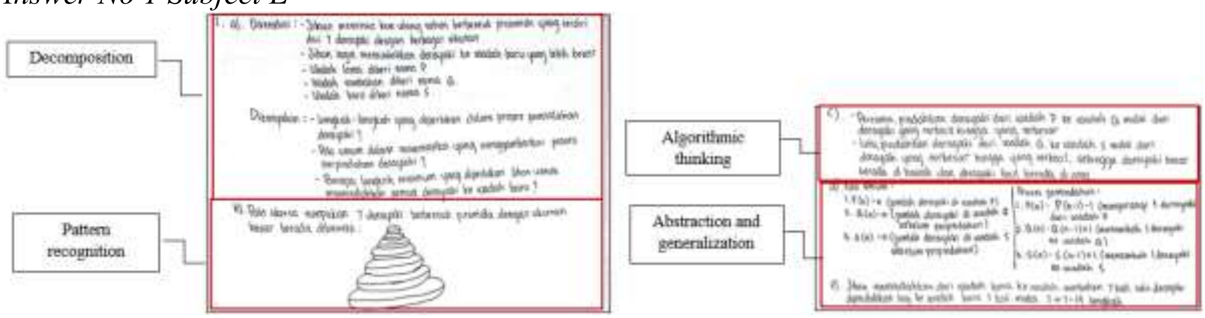
Of the 3 selected students, they were given a type 1 computational thinking ability test, after which it was followed by an interview. Then the next day, 3 research subjects were again given a type 2 computational thinking ability test with different numbers. The following are the results and discussions of the three subjects in each category:

Subjects with High Mathematical Literacy Skills (E)

a. Type 1 data exposure

Figure 1

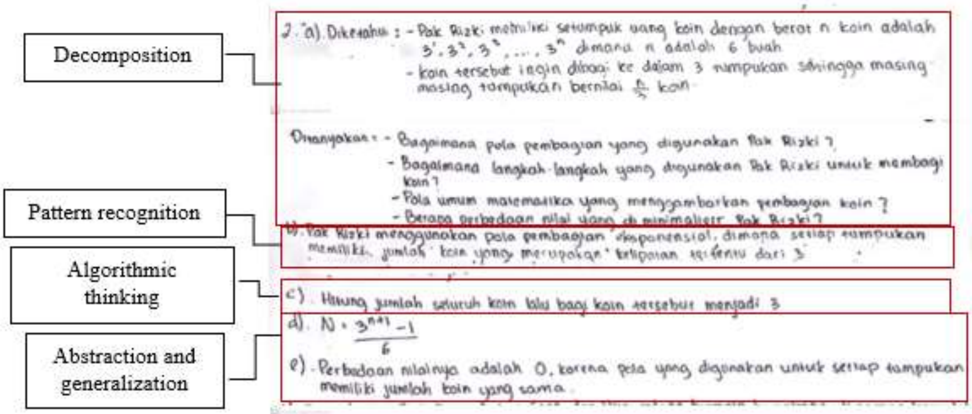
Answer No 1 Subject E



According to answer no 1, subject E was able to work on the decomposition process, but it was still incomplete because he did not write down the rules for moving the dorayaki used and did not write down the information asked. On the pattern recognition indicator, subject E can recognize the pattern precisely. In the algorithmic thinking indicator, subject E has written down the logical solution steps, but it is not appropriate because subject E forgot the instructions for moving the dorayaki. In the abstraction and generalization indicators, subject E is able to write down the general mathematical patterns used in the problem, but it is not precise so that the final conclusion that is prepared is also inaccurate because the mathematical pattern used is not in accordance with the rules of moving the dorayaki.

Figure 2

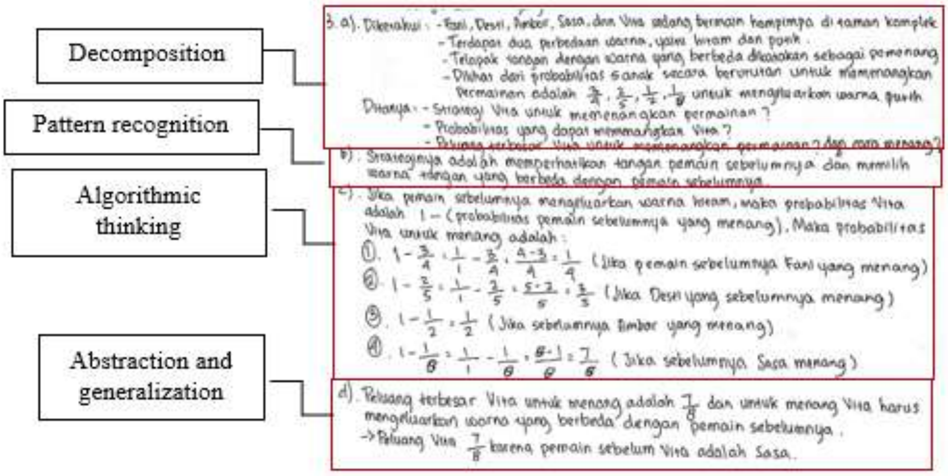
Answer No 2 Subject E



According to answer no 2, subject E was able to work on the decomposition process, but it was still incomplete because the question point a in the question was not included in the information asked. On the pattern recognition indicator, subject E was able to recognize the pattern but it was still inaccurate because it did not pay attention to the balance of the weight of the coin in dividing it into three piles. In the algorithmic thinking indicator, subject E has not been able to write down the steps to solve logically and systematically because it does not describe the calculation process in answering this problem. In the abstraction and generalization indicators, subject E is able to write down the mathematical pattern used in the problem, but it is not precise because the mathematical pattern used does not describe the division of coins so that the final conclusion that is prepared is also inaccurate.

Figure 3

Answer No 3 Subject E

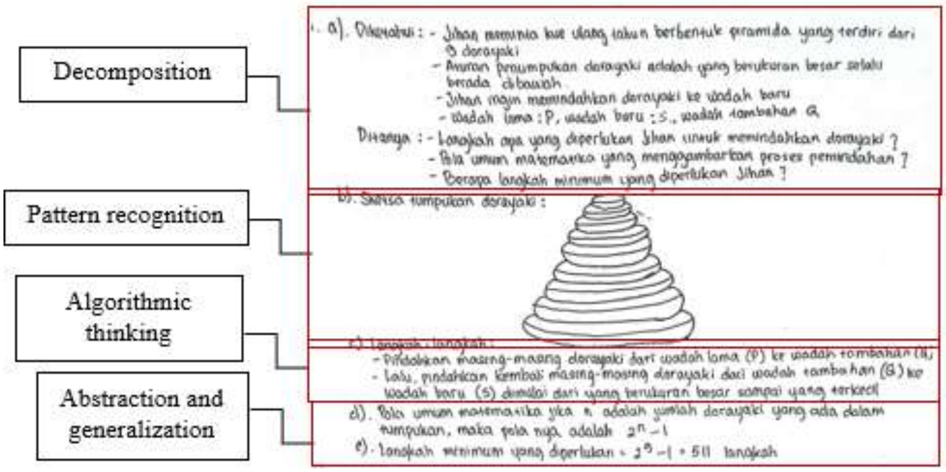


According to answer no 3, subject E was able to work on the decomposition process, but it was still incomplete because the question point a in the question was not included in the information asked. In the pattern recognition indicator, subject E is able to recognize the pattern, but it is not accurate because it only looks at the palm of the previous player without knowing the total chance of each color. In the algorithmic thinking indicator, subject E is able to write down the steps to solve logically, but it is not precise because it does not calculate the total chance of each child who pulls out the white palm that has been known in the problem. In the abstraction and generalization indicators, subject E is able to write down the general pattern used in the problem, but it is not precise in drawing the final conclusion because subject E only calculates the probability of each child if the previous player draws black only plus does not accumulate the total black chance of each child so that Vita's probability of winning is not accurate.

b. Type 2 data exposure

Figure 4

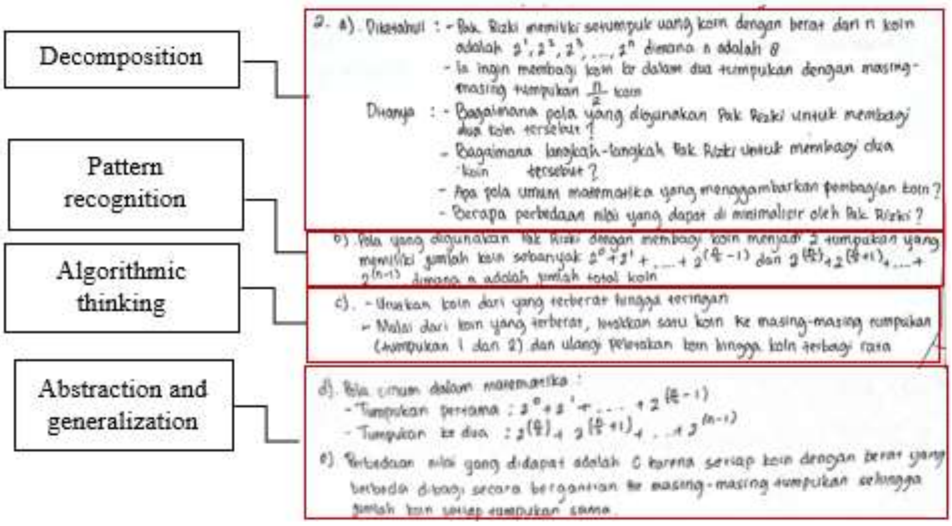
Answer No 1 Subject E



According to answer no 1, subject E was able to work on the decomposition process, but it was still incomplete because questions a and b were not included in the information asked. In the pattern recognition indicator, subject E is able to recognize the pattern precisely, it can be seen that subject E is able to describe the sketch of the dorayaki pile. In the algorithmic thinking indicator, subject E has written down the logical solution steps, but it is not appropriate because subject E forgot the instructions for moving the dorayaki. In the abstraction and generalization indicators, subject E is able to write down the general mathematical patterns used in the problem precisely so that the final conclusion produced is also correct.

Figure 5

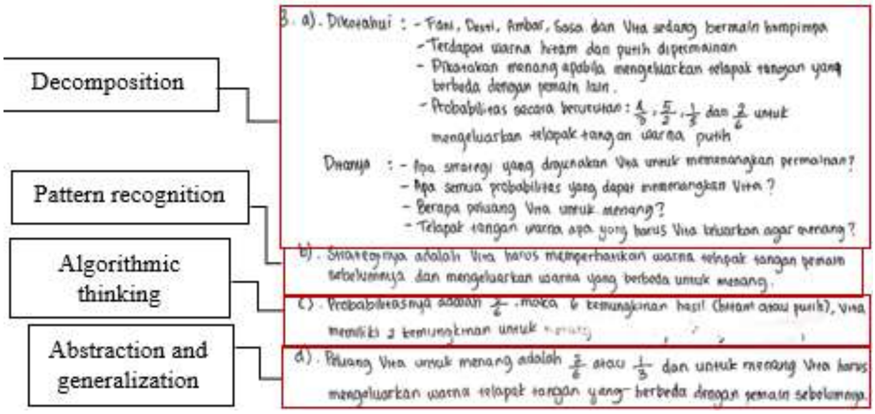
Answer No 2 Subject E



According to answer no 2, subject E was able to work on the decomposition process, but it was still incomplete because the question point a in the question was not included in the information asked. In the pattern recognition indicator, subject E was able to recognize the pattern, but it was still not accurate because the pattern used in each stack was not balanced in minimizing the difference in values between the 2 stacks. In the algorithmic thinking indicator, subject E is able to write down the steps to solve logically, but it is not appropriate because it does not write and describe the process of adding the weight of the coins that have been divided evenly in each pile. In the abstraction and generalization indicators, subject E was able to write down the mathematical pattern used in the problem, but it was not precise because the mathematical pattern was not balanced in minimizing the difference in values between the 2 piles and there was an error in writing the order of weight to 8 coins that should have been $2^1, 2^2, 2^3, \dots, 2^8$ instead of $2^0, 2^1, 2^2, \dots, 2^7$ so that the final conclusion prepared is also inaccurate.

Figure 6

Answer No 3 Subject E



According to answer no 3, subject E was able to work on the decomposition process, but it was still incomplete because the question point a in the question was not included in the information asked. In the pattern recognition indicator, subject E is able to recognize the pattern, but it is not accurate because it only pays attention to the color of the previous player's palm without knowing the total odds of each color so that the chances of winning the game are more accurate. In the algorithmic thinking indicator, subject E is not able to write down the solution steps logically and systematically, because he only writes down the results of the probability without describing how to obtain the probability. In the abstraction and generalization indicators, subject E is able to write down the general pattern used in the problem, but it is not precise in drawing the final conclusion because in the previous point the calculation process to get the greatest chance of Vita was not described, so it is not known what color the previous player issued.

Based on this explanation, it can be seen that students with high mathematical literacy skills (E) in type 1 and 2 questions, can carry out the decomposition process but it is still inappropriate because students do not write down the information asked in complete. During the interview, students can re-explain the intent of the question, even if they do not mention the question point a in the question as the information asked. In line with research (Mubarokah et al., 2023) said that students met the decomposition indicator even though they were incomplete in writing and describing what information was found and asked in the question. Furthermore, pattern recognition, in number 1 students can recognize patterns with appropriate patterns and make sketches requested, unlike in number 2 and 3 students are able to recognize patterns but are not precise because the patterns used by students are not appropriate. During the interview, in no 1 students were able to identify information on the rules for moving dorayaki, while in no 2 and 3 students said that the pattern used was not accurate because they were not careful in reading the questions. In line with research (Supiarmo et al., 2021) said that the recognition of the wrong pattern can have a consistent effect on the problem-solving process. A person's mistake in understanding the question can be caused by one of the factors, namely the person's lack of thoroughness in reading the question (Agustian et al., 2020).

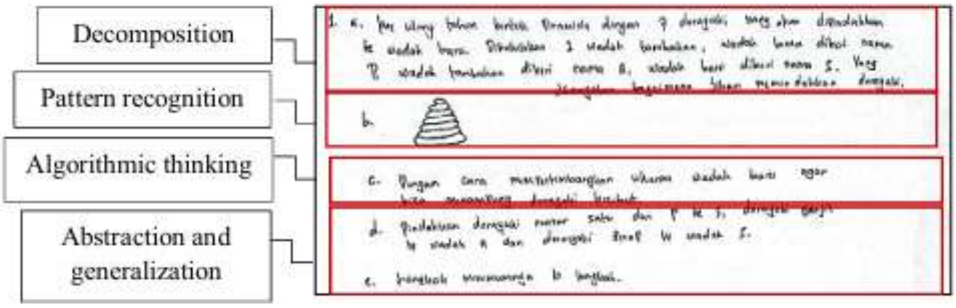
Then thinking algorithms, students can write down the steps to solve logically but it is not precise because there are still steps that are missed. During the interview, the student only briefly describes the steps listed in the answer sheet, especially at no 1 the student forgets the instructions for moving the dorayaki. In line with research (Jamna et al., 2022) said that high category students were less than perfect on algorithmic thinking indicators. Then abstraction and generalization, students are able to write down the general mathematical patterns used in the problem but are not precise so that the final conclusion that is compiled is also not correct. During the interview, students were not confident in drawing conclusions because there were mistakes in writing down their mathematical patterns and students were not very able to make mathematical patterns in the questions. In line with research (Syahda & Pujiastuti, 2020) that the majority of students make many mistakes in the calculation process.

Subjects with Medium Mathematical Literacy Skills (SNH)

a. Type data exposure 1

Figure 7

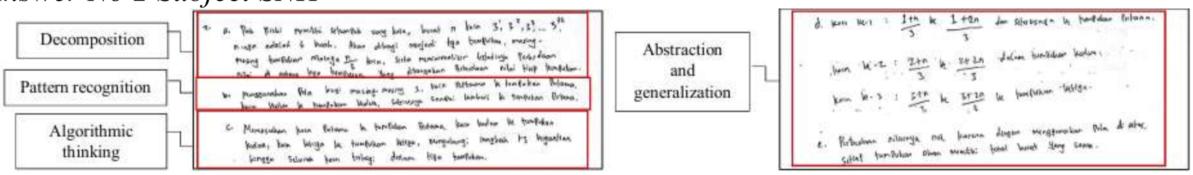
Answer No 1 Subject SNH



According to answer no. 1, the SNH subject was able to work on the decomposition process, but it was still incomplete because he did not write down the rules for moving the dorayaki used and did not write down the information asked. In the pattern recognition indicator, SNH subjects can recognize patterns accurately. In the algorithmic thinking indicator, SNH subjects are able to write down the steps to solve, but it is not appropriate because they do not carry out the process of moving the dorayaki as requested in the problem. In the abstraction and generalization indicators, SNH subjects have not been able to write down the mathematical patterns used in the problem, because they do not include mathematical formulas/patterns that can be processed into a calculation process so that the final conclusion prepared is not appropriate.

Figure 8

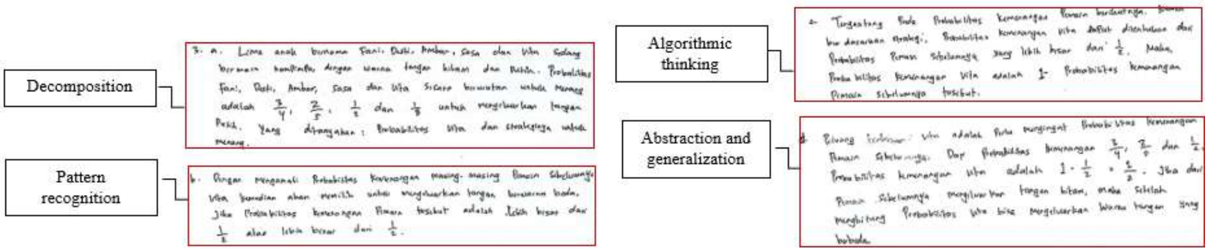
Answer No 2 Subject SNH



According to answer no 2, the SNH subject was able to work on the decomposition process, but it was still incomplete because it was not accurate in writing the information asked in the question. In the pattern recognition indicator, SNH subjects were able to recognize patterns, but it was not appropriate because the pattern used did not pay attention to the balance in the stack. In the algorithmic thinking indicator, the SNH subject was able to write down the steps to solve logically and systematically, but it was still incomplete because it did not write the results of the distribution of coins in each pile. In the abstraction and generalization indicators, SNH subjects are able to write down the mathematical patterns used in the problem but are not precise because the mathematical patterns used do not describe the division of coins so that the final conclusion that is prepared is not appropriate.

Figure 9

Answer No 3 Subject SNH

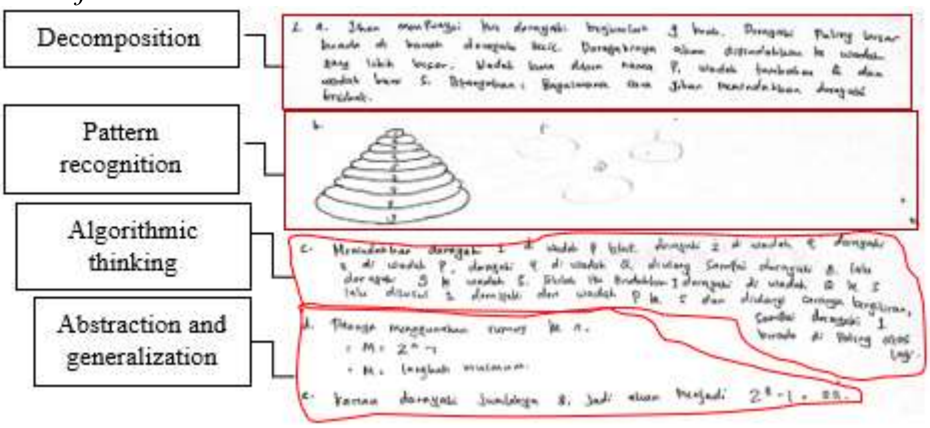


According to answer no. 3, the SNH subject was able to work on the decomposition process, but it was still incomplete because he did not write down the conditions for becoming a winner in the hompimpa game and did not write down the information asked for it correctly. In the pattern recognition indicator, SNH subjects were able to recognize patterns, but it was not precise because the strategy used did not refer to the total probability of the 4 children in each color. In the algorithmic thinking indicator, SNH subjects were able to write down the solution steps logically but were not precise because they did not calculate and describe the process of calculating the total chance of the 4 children in each color. In the abstraction and generalization indicators, the SNH subject was able to write down the general pattern used in the problem, but it was not precise in drawing the final conclusion because the SNH subject only calculated the probability of one child, namely Ambar who issued a black color plus did not calculate the total chance of the 4 children in each color so that Vita's probability of winning was not precise.

b. Type 2 data exposure

Figure 10

Answer No 1 Subject SNH



According to answer no. 1, SNH subjects were able to work on the decomposition process, but it was still incomplete because it was not accurate in writing down the information asked in the question. In the pattern recognition indicator, SNH subjects are able to recognize patterns precisely, it can be seen that SNH subjects are able to describe sketches of dorayaki piles. In the algorithmic thinking indicator, the SNH subject is able to write down the steps to solve it, but it is not appropriate because in the process of moving the dorayaki does not pay attention to the rules of moving the dorayaki. In the abstraction and generalization indicators, SNH subjects are able to write down the general mathematical patterns used in the problem precisely so that the final conclusion that is prepared is also correct.

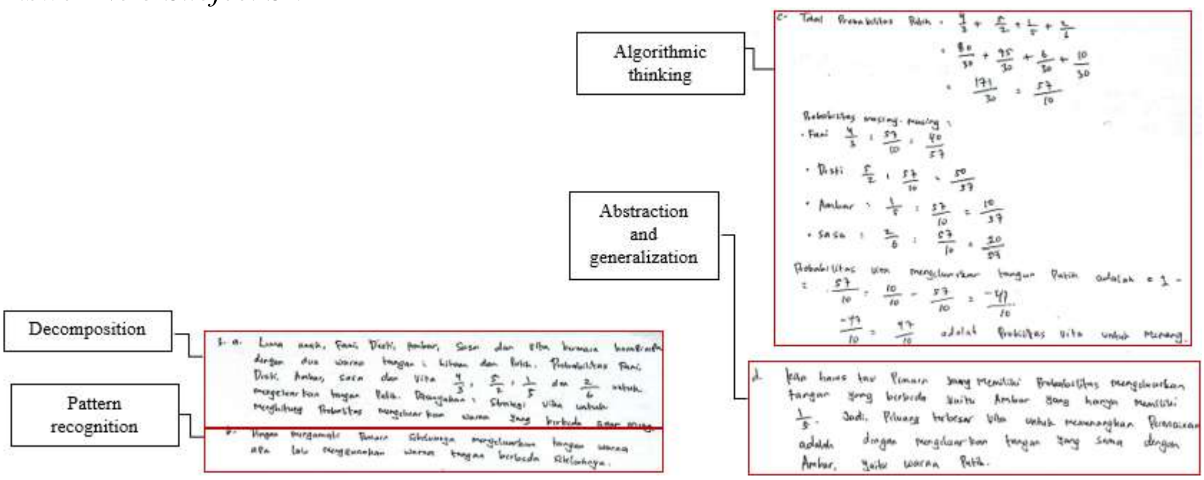
Figure 11

Answer No 2 Subject SNH

According to answer no 2, the SNH subject was able to work on the decomposition process, but it was still incomplete because it was not accurate in writing the information asked in the question. In the pattern recognition indicator, SNH subjects were able to recognize patterns, but it was not accurate because they did not minimize the difference in values between the two stacks. In the algorithmic thinking indicator, the SNH subject is able to write down the steps to solve logically, but it is not precise because it does not write the results of the distribution of coins and the process of adding the weight of coins that have been divided evenly in each stack. In the abstraction and generalization indicators, SNH subjects have not been able to write down the mathematical patterns used in the problem, because they do not include mathematical formulas/patterns that can be processed into a calculation process so that the final conclusion prepared is not appropriate.

Figure 12

Answer No 3 Subject SNH



According to answer no. 3, the SNH subject was able to work on the decomposition process, but it was still incomplete because it did not write the conditions for becoming a winner in the hompimpa game and was not correct in writing the information asked in the question. In the pattern recognition indicator, the SNH subject was able to recognize the pattern, but it was not accurate because it only observed the palm of the previous player without knowing the total odds of each color so that the chances of winning the game were more accurate. In the algorithmic thinking indicator, SNH subjects were able to write down the steps to solve logically, but it was not appropriate because there was an error in calculating the total chance of 4 children who issued white palms and did not calculate the total odds of each child who issued black palms. In the abstraction and generalization indicators, the SNH subject has not been able to write down the general pattern used in the problem so that the final conclusion that is prepared is not correct, because it is not in accordance with the requirements to win the game where you have to take out a different palm color from the previous player instead of the same palm.

Based on this explanation, it can be seen that students with medium mathematical literacy skills (SNH) in type 1 and 2 questions, can carry out the decomposition process but it is still inappropriate because students do not write down the information asked in complete. During the interview, students can explain the intent of the questions but because they are not thorough, they do not write down the important information found in the questions and are only able to mention some of the information asked even though there are many questions listed in the questions. In line with research (Mubarokah et al., 2023) said that students met the decomposition indicator even though they were incomplete in writing down what information was found and asked in the question. Furthermore, pattern recognition, in number 1 students can recognize patterns with appropriate patterns and make sketches requested, unlike in number 2 and 3 students are able to recognize patterns but are not precise because the patterns used by students are not appropriate. During the interview, in no 1 students were able to identify what containers were used, while in no 2 and 3 students said that the patterns used were not accurate. In line with research (Supiarmo et al., 2021) that the recognition of incorrect patterns can have a consistent effect on the problem-solving process.

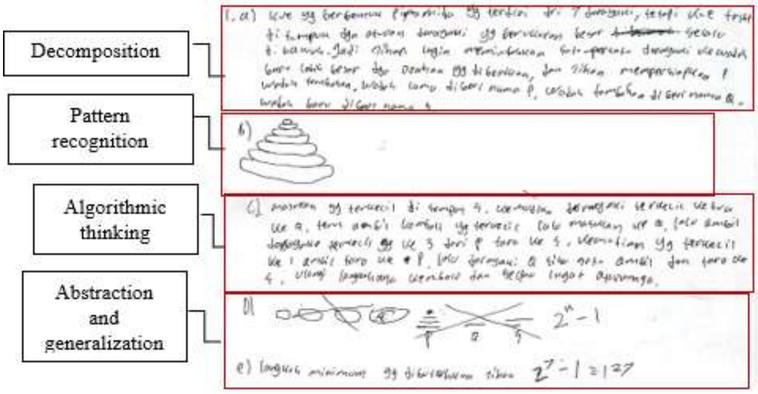
Then thinking algorithms, students can write down the steps to solve logically but it is not precise because there are still steps that are missed. During the interview, the student said that there was an error in the calculation and did not double-check the answer. In line with research (Fauziyah & Pujiastuti, 2020) that students always repeat the same mistakes by not double-checking their answers. According to (Jamna et al., 2022) Students in the medium category are less able to meet the indicators of algorithmic thinking. Then abstraction and generalization, students have not been able to write down the general mathematical patterns used in the problem so that the final conclusion that is prepared is not correct. During the interview, students try to answer mathematical patterns by trial and error. This is because students do not understand the material being tested (Adhyan & Sutirna, 2022).

Subjects with Low Mathematical Literacy (MRA)

a. Type 1 data exposure

Figure 13

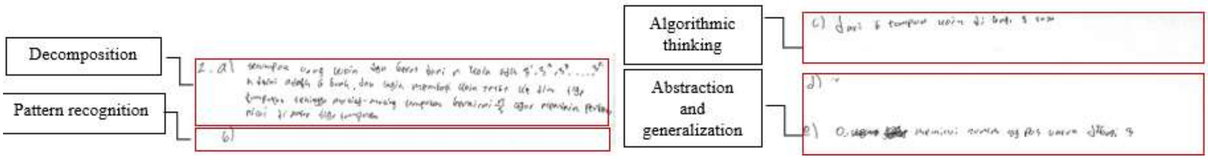
Answer No 1 Subject MRA



According to answer no. 1, the MRA subject is able to work on the decomposition process, but it is not appropriate because it can only write down the information known from the question without being able to understand the meaning of the question and does not write down the information asked in the question at all. In the pattern recognition indicator, MRA subjects can recognize patterns precisely, but are confused in understanding the problem. In the algorithmic thinking indicator, the MRA subject has written down the logical solution steps, but it is not appropriate because the MRA subject is confused in understanding the problem. In the abstraction and generalization indicators, MRA subjects were able to write down the mathematical patterns used in the problem and draw the final conclusion correctly even though they were still confused in understanding the problem and looked not so confident in writing the mathematical patterns because of many mistakes in answering.

Figure 14

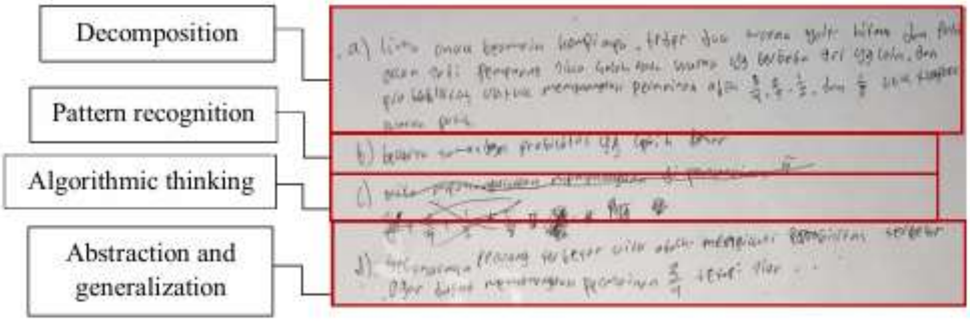
Answer No 2 Subject MRA



According to answer no. 2, the MRA subject is able to do the decomposition process, but it is not appropriate because it can only write down the information known from the question without being able to understand the meaning of the question and does not write down the information asked in the question at all. In the pattern recognition indicator, MRA subjects did not write down at all the patterns used in the questions. In the algorithmic thinking indicator, the MRA subject is not able to write down the solution steps logically and systematically because the MRA subject cannot answer the pattern used in the problem nor can he understand the meaning of the problem. In the abstraction and generalization indicators, MRA subjects do not write down at all the mathematical patterns used in the problem so that the final conclusion drawn is not correct.

Figure 15

Answer No 3 Subject MRA

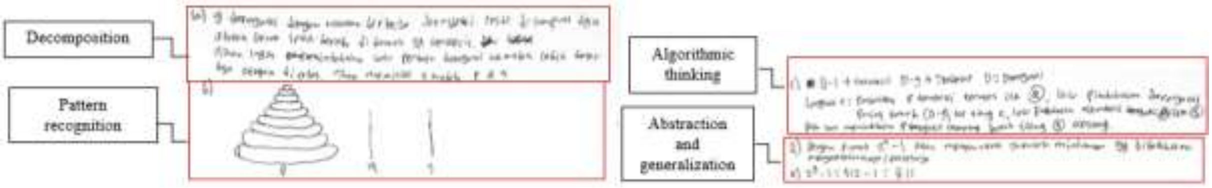


According to answer no 3, the MRA subject was able to work on the decomposition process, but it was not appropriate because he could only write down the information found from the question without writing down the information asked in the question at all. In the pattern recognition indicator, the MRA subject was able to recognize the pattern, but it was not accurate because the strategy used was not accurate to make Vita can be said to be the winner. In the algorithmic thinking indicator, the MRA subject does not write down any logical and systematic completion steps. In the indicators of abstraction and generalization, MRA subjects have not been able to write down the general patterns used in the problem so that they cannot draw the final conclusion because they are unable to solve problem number 3 completely.

b. Type 2 data exposure

Figure 16

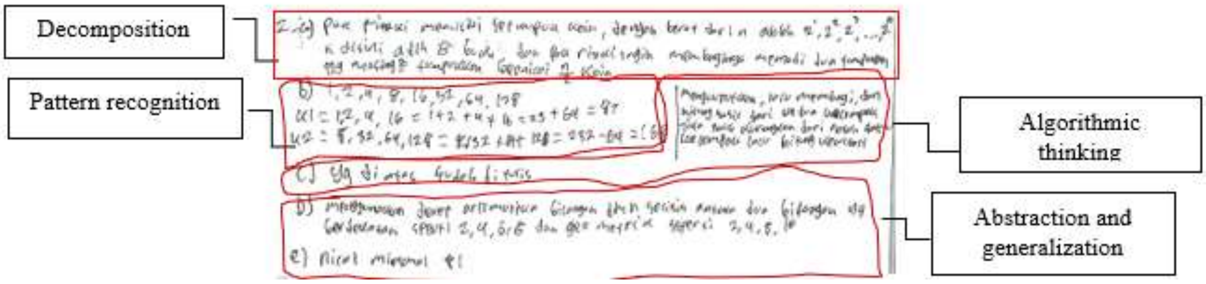
Answer No 1 Subject MRA



According to answer no. 1, the MRA subject is able to work on the decomposition process, but it is not appropriate because it can only write down the information found from the question without writing down the information asked in the question at all. In the pattern recognition indicator, the MRA subject is able to recognize the pattern precisely, it can be seen that the MRA subject is able to describe the sketch of the dorayaki pile. On the algorithmic thinking indicator, the MRA subject has written down the logical solution steps, but it is not appropriate because the MRA subject moves the dorayaki at once 8 pieces instead of moving them one by one to a new container while still paying attention to the rules of moving. In the abstraction and generalization indicators, MRA subjects are able to write down the general mathematical patterns used in the problem precisely so that the final conclusion produced is also correct.

Figure 17

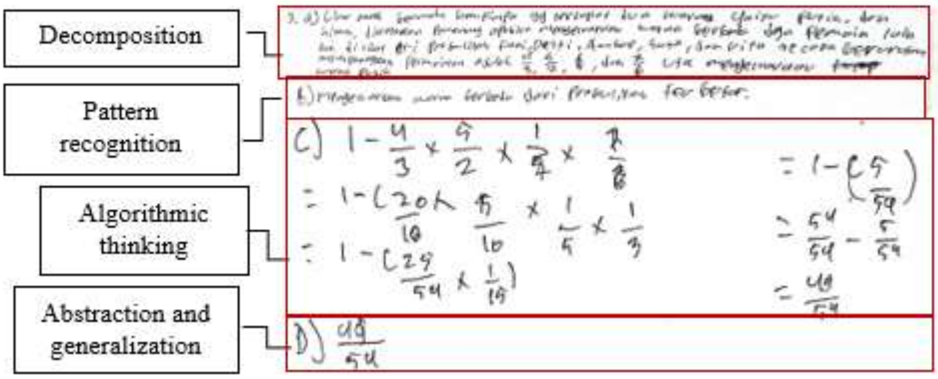
Answer No 2 Subject MRA



According to answer no 2, the MRA subject is able to work on the decomposition process, but it is not appropriate because it can only write down the information found from the question without writing down the information asked in the question at all. In the pattern recognition indicator, the MRA subject was able to recognize the pattern, but it was still not accurate because it was not informed what kind of pattern it was used and there was an error in writing the order of weight to the 8 coins that should have been $2^1, 2^2, 2^3, \ldots, 2^8$ instead of $2^0, 2^1, 2^2, \ldots, 2^7$. In the algorithmic thinking indicator, the MRA subject has written down the steps to solve logically, but it is not appropriate because there is an error in writing the order of weight to the 8 coins that should be $2^1, 2^2, 2^3, \ldots, 2^8$ instead of $2^0, 2^1, 2^2, \ldots, 2^7$ and there is a calculation error in the process of adding the weight of the coin. In the abstraction and generalization indicators, MRA subjects have not been able to write down the mathematical patterns used in the problems so that the final conclusion prepared is not correct.

Figure 18

Answer No 3 Subject MRA



According to answer no 3, the MRA subject was able to work on the decomposition process, but it was not appropriate because he could only write down the information found from the question without writing down the information asked in the question at all. In the pattern recognition indicator, the MRA subject was able to recognize the pattern, but it was not accurate because the strategy used directly removed the color that was different from the largest probability without calculating the total chance of the 4 children in each color first. In the algorithmic thinking indicator, the MRA subject has written down the steps to solve, but it is not accurate because it does not calculate the total chance of each child who pulls out the white palm that has been known in the question and is also incomplete in writing the answer information. In the indicators of abstraction and generalization, the MRA subject is not able to write down the general patterns used in the questions so that in drawing the final conclusion it becomes incorrect, plus in the previous point the MRA subject is incomplete in writing the answer information.

Based on this explanation, it can be seen that students with low mathematical literacy skills (MRA) in types 1 and 2 problems, are able to carry out the decomposition process but are not appropriate because they can only write down the information known from the questions without being able to understand the meaning of the questions and do not write down the information asked at all in the questions. During the interview, students were still confused in understanding the questions and said they were used to not writing down the information asked when answering the questions. This is due to the fact that students do not have the habit of first writing down the known elements and being asked about the questions before solving the problem (Ramadhani & Hakim, 2021). Furthermore, pattern recognition, in number 1 students can recognize patterns with appropriate patterns, unlike in number 2 and 3 students are able to recognize patterns but are not precise because the patterns used by students are not yet appropriate. During the interview, students at no. 1, 2 and 3 said that they were still confused in understanding the problem and that they were only able to describe the sketch of the pile of dorayaki in no. 1 without being able to understand the problem. In line with research (Supiarmo et al., 2021) that the recognition of incorrect patterns can have a consistent effect on problem solving.

Then thinking algorithms, MRA subjects have not been able to involve algorithmic thinking in solving type 1 problems because in each number there are many previous questions that are not answered and are only able to involve algorithmic thinking in type 2 problems even though it is not appropriate because there are still steps that are missed and there are errors in the calculation process. In line with research (Adhyan & Sutirna, 2022) which said that students' inability to comprehend the difficulties at hand was the reason for their errors when solving tasks in the low category. Then abstraction and generalization, students have not been able to write down the general mathematical patterns used in the problem so that the final conclusion that is prepared is not correct. During the interview, students said they were not sure of the answer. This is because if there is an error at the beginning, the next step will be affected which makes the student's final answer not as desired (Nuvitalia et al., 2022).

4. Conclusion

Based on the results of the research conducted, it can be concluded that overall students' computational thinking skills are still relatively low because they have not mastered and applied all the indicators to the maximum. However, subject E had better computational thinking skills compared to SNH subjects and MRA subjects. In line with research (Muslimah & Pujiastuti, 2020) which says that the higher the mathematical literacy ability of the student, the higher the tendency of the student to get the correct answer to the problem, and vice versa, the lower the mathematical literacy ability of the student, the lower the tendency of the student to get the correct answer to the question. Subject E with high mathematical literacy skills, able to involve 4 indicators, namely decomposition, pattern recognition, algorithmic thinking, abstraction and generalization in solving problems in both type 1 and 2 problems. SNH subjects with medium mathematical literacy skills, in solving problems are able to involve 3 indicators, namely decomposition, pattern recognition, and algorithmic thinking both in type 1 and 2 problems, less able to involve abstraction and generalization indicators in both type 1 and 2 problems. MRA subjects with low mathematical literacy skills, in solving problems, are able to involve 2 indicators, namely decomposition and pattern recognition both in type 1 and 2 problems, able to involve algorithmic thinking indicators only in type 2 problems, less able to involve algorithmic thinking indicators in type 1 problems, and abstraction and generalization in both type 1 and 2 problems. Therefore, for the next researcher, it is hoped that they can develop a mathematical learning tool that combines computational thinking skills.

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