The preliminary study of students’ creative problem-solving ability

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Abstract. Mathematics helps students to practice their thinking skills. One of the thinking skills expected to face the times is the ability to think creatively. Therefor we need a qualitative research with descriptive methods. The research that was conducted at SMP Santo Yoseph Medan in the academic year 2020/2021 involved 16 students representing class VII-B and 14 students representing VII-C junior high schools as research subjects and the results showed that students’ creative problem-solving abilities did not show good results. The instrument used was a test of creative problem-solving abilities which consisted of 3 questions. This is analyzed based on the indicators of fluency, flexibility, and originality for solving questions number 1, 2, and 3. Based on the fluency indicator in solving problem number 1, data is obtained that 14 people are not fluent and 16 people are fluent. In solving problem number 2, data is obtained that 15 people are not fluent and 12 people are fluent. In solving problem number 3, it is obtained data that 18 people are not fluent and 12 people are fluent. Based on the indicator of flexibility in solving problem number 1, it is obtained data that 29 people are not flexible and 1 person is less flexible. In solving problem number 2, it is obtained data that 30 people are not flexible and none are flexible. In solving problem number 3, it is obtained data that 30 people are not flexible and none are flexible. Based on the originality indicator in solving problem number 1, it is obtained data that 29 are not new and 1 person is not new. In solving problem number 2, data shows that 27 are not new and 3 are not new. In solving problem number 3, it is obtained data that 27 people are not new and 3 people are not new.

1. Introduction

Students’ thinking skills are trained through math problems. Many people do not realize that mathematics is nothing more than numbers and equations, but in fact mathematics is central to all kinds of children’s activities including art, games, toys, drawings, and poetry, it’s just not that obvious [1]. Whether we are aware of it or not, we use mathematics in every aspect of life. But most students around the world don’t like math [2]. Students’ perceptions that mathematics is abstract and therefore learning mathematics does not provide benefits [3]. Therefore, in teaching practice, the teacher’s job is to anticipate and interpret students’ mathematical thinking. In addition, the ability to anticipate the possible responses of students with different conceptual understanding characteristics is also needed [4].

According to Nicolaidou and Philippou stated that when children go to school they usually have a positive attitude towards mathematics. However, as they progress their attitudes become less positive and they often become negative at school [5]. Mathematics cannot be separated from problem solving.
The thinking process of students in problem solving requires the attention and assistance of teachers in developing problem-solving skills in both the real-world context and the context of mathematics [6].

One of the goals of learning mathematics in school is that students can solve math problems by carrying out procedures and getting answers. Mairing, Budayasa, and Juniati stated that students are able to solve math problems if students have a suitable scheme to solve the problem. Schemes that are constructed from meaningful knowledge of relevant concepts, experience in solving problems, understanding of the problem being solved, and knowledge of problem-solving approaches or strategies [7]. Alenezi states that one of the problems in mathematics is because students memorize the procedure and it automatically appears in the mind of the student. Students should be encouraged to understand the procedure and how to apply it to the wider life [8].

One of the efforts to overcome the challenges in the effectiveness of learning in mathematics classrooms is that educators shift from a teacher-centered approach to a more student-centered one, and the concrete application of mathematics [9]. Effective mathematics teachers are teachers who do certain things when delivering mathematics learning, tend toward discovery or teacher-directed ways [10]. When one has to solve a problem, it is not a priori a very easy task. It is a challenge in developing creativity and math skills [11]. The complex structure of problem solving is presented by Subanji (2019) in the following figure:

![Figure 1. Structure of complex problem solving.](image)

In connection with the complex structure of problem solving above, it also describes the steps in solving problem. Troubleshooting steps are required to solve the problem. Polya (1973) state four steps, namely (1) understanding the problem, (2) devising a plan, (3) carry out the plan, and (4) looking back [12]. The activities of each of these steps are described in following table:

| Number | Steps                  | Learning Activities                                           |
|--------|------------------------|--------------------------------------------------------------|
| 1.     | Understanding the problem | In this step, we begin by reading the problem carefully, with an introduction |
Number | Steps | Learning Activities
--- | --- | ---
2. | Devising a plan | to what is known and what data is not available
This step can use the many strategies and techniques used or by making systematic steps in preparing a completion plan.
3. | Carry out the plan | If in the second step the details have been successfully detailed, then in implementing the plan, the problem is compiled into a simple form and performs the necessary calculations.
4. | Looking back | In this step, after the answer is found, check the problem-solving method again, whether the answer obtained is correct.

In the process of finding answers to mathematical problems, creative thinking is needed. Guilford states that creative thinking is a divergent thought process with an emphasis on diversity in terms of quantity and suitability [13]. In general, the assessment of students’ creativity in solving problems is based on quantitative assessments of fluency, flexibility, and novelty [14]. The explanation of each indicator of creative thinking ability is described in the following tables [15].

**Table 2.** Indicators of creative thinking skills.

| The Characteristic of Creative Thinking | Indicators |
| --- | --- |
| Fluency | The students able to solve problem correctly and fluently. |
| Flexibility | The students are able to solve problems with various solutions. |
| Novelty | The students are able to create a new problem or different ideas from problems in general |

| Level of Creative Thinking | Indicators |
| --- | --- |
| Fluency | Flexibility | Novelty |
| 4 (very creative) | √ | √ | √ |
| 3 (creative) | √ | - | √ |
| 2 (fairly creative) | - | √ | - |
| 1 (hardly creative) | √ | - | - |
| 0 (not creative) | - | - | - |

While the level of problem-solving creativity is presented in following table:

**Table 3.** Levels of creative thinking.

Based on the description above, the formulation of the problem in this study is how is the initial analysis of students' creative thinking abilities in solving math problems? The benefits of this research are, it is hoped that (1) Students obtain information about their creative thinking in solving problems
and as a reference for measuring their creative thinking skills; (2) adding knowledge for teachers or educators about techniques for evaluating students’ creative thinking abilities; (3) can be a positive input for teachers and educators in improving students’ creative thinking skills.

2. Method of Research

The type of research is qualitative research with descriptive methods. The research was conducted at SMP Santo Yoseph Medan in the Academic Years 2020/2021 in the old semester with a preliminary study conducted from 3 August to 15 August 2020. The subjects of the research were 30 students of class VII Junior High School, which were taken randomly from some of the students of class VII-B and VII-C. Based on the answers sent and the math teacher’s considerations, 30 students were selected as research subjects. Students’ creative thinking abilities in solving problems were analyzed based on indicators of creative thinking abilities, namely fluency, flexibility, and novelty.

To find out students’ creative thinking skills in solving problems in the material of the addition and subtraction of integers operations, a creative thinking ability test has been prepared by the researcher which consists of three essay questions. To obtain research data, the data collection technique used in this study was the test technique. A research instrument is said to be valid if instrument is able to measure what should be measured [15]. The guidelines for assessing problem solving abilities based on indicators of creative thinking abilities are presented in the following table:

| Creativity Indicators | Student Criteria                                                                 | Quality    |
|-----------------------|----------------------------------------------------------------------------------|------------|
| Fluency               |                                                                                   |            |
| Score 3               | Students show to do a variety of problem solving and all correct (more than two kinds). | Very Fluency |
| Score 2               | Students show one or two different ways of doing problem solving and they are all correct, Or students show more than two kinds of ways of doing problem solving, but some are written or mentioned incorrectly | Fluency    |
| Score 1               | Students show one or two kinds of ways of doing problem solving, but there are ways of doing that are written or mentioned incorrectly | Less Fluency |
| Score 0               | Students do not show how to do problem solving with or show one or two ways of doing problem solving, but all of them score wrong. | Not Fluency |
| Flexibility           |                                                                                   |            |
| Score 3               | Students can change the way of solving one problem to another way of solving more than two different ways and all of them are correct | Very Flexible |
| Score 2               | Students can change the way of doing problem solving one way or another which differ by one | Flexible   |
| Creativity Indicators | Student Criteria | Quality |
|-----------------------|------------------|---------|
|                       | or two. Or students can change the way of doing problem solving one way to another which is different from more than two, but there are some ways that are written or mentioned wrong. | Less Flexible |
| Score 0               | Students cannot change the way of doing problem solving from one way to another that is different or can change the way of doing problem solving from one another differently, but the score is wrong. | Not Flexible |
|                       | Students can change one or two different ways of doing problem solving, but only some of the ways can be written or mentioned correctly. | |
| Score 1               | Students demonstrate how to do different problem solutions (more than two) and write or enumerate correctly. Or show one or more ways of doing problem solving that are not usually done by individuals (students at a stage of development or level of knowledge). | Very Novelty |
|                       | Students demonstrate how to do different problem solving (as much as one or two) and write or enumerate correctly. Or students show how to do different problem solving (as many as more than two), but some are written or mentioned wrong. | Novelty |
| Score 2               | Students demonstrate how to do different problem solutions (as many as one or two), but can only write or list partially correct ones. Or students show a way of working on problem solving that is not usually done by individuals (students) at the stage of their development or level of knowledge, but can only write down or mention | Less Novelty |
Creativity Indicators | Student Criteria | Quality
--- | --- | ---
Score 0 | partially correct ones. Students do not show how to do different problem solving or do not show one way of doing problem solving that cannot be done by individuals (students) at their developmental stage or level of knowledge. Or show you how to do a problem solving that is different, but worth wrong. | Not Novelty

3. Results and Discussion
In this section, data analysis of students’ creative thinking ability is presented in terms of three indicators of creative thinking abilities, namely fluency, flexibility, and novelty.

3.1. The Analysis Data by Fluency
Fluency in thinking is the ability to generate many ideas and solutions to a relevant problem and a smooth flow of thought. Data for a number of students based on fluency indicators can be seen in the following table:

| Question Number | Quality of Creative Problem Solving (Number of Students) |
| --- | --- |
|  | Not Fluency | Less Fluency | Fluency | Very Fluency |
| 1 | 14 | - | 16 | - |
| 2 | 15 | - | 15 | - |
| 3 | 18 | - | 12 | - |
| Average | 15.7 | - | 14.3 | - |

In the table above, the mean number of students in the not fluency category is 15.7 and the fluency is 14.3. While the other categories do not exist.

3.2. The Analysis Data by Flexibility
Flexibility in thinking is the ability to provide uniform answers or ideas but different directions of thought, able to change ways or approaches and be able to see problems from various viewpoints. Data for a number of students based on the flexibility indicator can be seen in the following table:

| Question Number | Quality of Creative Problem Solving (Number of Students) |
| --- | --- |
|  | Not Flexible | Less Flexible | Flexible | Very Flexible |
| 1 | 29 | 1 | - | - |
| 2 | 30 | - | - | - |
| 3 | 30 | - | - | - |
| Average | 29.7 | 0.3 | - | - |

In the table above, the mean number of students who are not flexible is 29.7 and students who are in the less flexible category are 0.3. While the other categories do not exist.
3.3. The Analysis Data by Novelty

Authenticity is ability to give birth to new, unique expressions, and to think in ways that are different from the others, which most people give. Data for a number of students based on the novelty indicator can be seen in the following table:

Table 7. Data on the number of students reviewed based on novelty indicators.

| Questions Number | Quality of Creative Problem Solving (Number of Students) |
|------------------|---------------------------------------------------------|
|                  | Not Novelty | Less Novelty | Novelty | Very Novelty |
| 1                | 29          | 1            | -       | -            |
| 2                | 27          | 3            | -       | -            |
| 3                | 27          | 3            | -       | -            |
| Average          | 27.7        | 2.3          | -       | -            |

In the table above, the mean number of students who are not novelty is 27.7 and students who are in the less novelty category are 2.3. While the other categories do not exist.

For the results of the research on creative problem-solving abilities based on the results of students’ answers to test number one are described in the following table:

Table 8. Data on student’s creative problem-solving abilities in class VII-B for problem number 1.

| No. | Student Code | Step 1 (Understanding the problem) | Step 2 (Devising a plan) | Step 3 (Carry out the plan) | Step 4 (Looking back) |
|-----|--------------|-----------------------------------|--------------------------|-----------------------------|------------------------|
| 1   | B04          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 2   | B05          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 3   | B09          | Not understand the problem        | Not Fluency              | Not flexible and not novelty| Do a re-check          |
| 4   | B10          | Not understand the problem        | Fluency                  | Not flexible and not novelty| Not re-check           |
| 5   | B13          | Not understand the problem        | Not Fluency              | Not flexible and not novelty| Not re-check           |
| 6   | B14          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 7   | B15          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 8   | B16          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 9   | B17          | Not understand the problem        | Not Fluency              | Not flexible and not novelty| Do a re-check          |
| 10  | B22          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 11  | B23          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check          |
| 12  | B25          | Understand the problem            | Fluency                  | Not flexible and not novelty| Not re-check           |
| 13  | B26          | Not understand the problem        | Not Fluency              | Not flexible and not novelty| Do a re-check          |
| 14  | B28          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Do a re-check          |
Based on the data table of class VII-B student representatives above, it is known that: (1) there are eight students who understand the problem well, can write more than one answer but the method is not diverse and not new, and checks, namely codes B04, B05, B14, B15, B16, B22, B23, B28; (2) there were three students of class VII-B who could not understand the problem, had more than one answer, but the solutions were not varied and not new, and checked, namely codes B09, B17, and B26; (3) there was one student in class VII-B who did not understand the problem, had more than one answer, but the method was not varied and not new and did not double-check, namely code B10; (4) There was one student in class VII-B who did not understand the problem, the answer and method were not available and did not re-check, namely code B13; (5) There was one student in class VII-B who did not understand the problem, had more than one answer, but the method was not varied and not new and did not double check, namely code B25. As for the data on representative class VII-C students for problem number 1 can be seen in the table:

**Table 9.** Data on student’s creative problem-solving abilities in class VII-C for problem number 1.

| No. | Student Code | Step 1 (Understanding the problem) | Step 2 (Devising a plan) | Step 3 (Carry out the plan) | Step 4 (Looking back) |
|-----|--------------|-----------------------------------|--------------------------|-----------------------------|-----------------------|
| 1.  | C04          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check         |
| 2.  | C05          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check         |
| 3.  | C06          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Not re-check          |
| 4.  | C08          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Not re-check          |
| 5.  | C11          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check         |
| 6.  | C12          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Do a re-check         |
| 7.  | C14          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check         |
| 8.  | C15          | Understand the problem            | Fluency                  | Not flexible and not novelty| Do a re-check         |
| 9.  | C16          | Not understand the problem        | Not Fluency              | Not flexible and not novelty| Do a re-check         |
| 10. | C20          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Not re-check          |
| 11. | C21          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Not re-check          |
| 12. | C22          | Understand the problem            | Fluency                  | Not flexible and not novelty| Not re-check          |
| 13. | C26          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Do a re-check         |
| 14. | C27          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Not re-check          |
| 15. | C28          | Understand the problem            | Not Fluency              | Not flexible and not novelty| Do a re-check         |
| 16. | C30          | Understand the problem            | Fluency                  | Not flexible and not novelty| Not re-check          |
Based on the data table of class VII-C student representatives above, it is known that: (1) there are five students who understand the problem, have more than one answer, but the solution is not varied and is not new and there is a double check, namely codes C04, C05, C11, C14, and C15; (2) there were five students who understood the problem but did not have answers and varied and new ways and did not conduct a review, namely codes C06, C08, C20, C21, C27; (3) there were three students who understood the problem and checked again but did not have the answers and varied and new methods, namely codes C12, C26, C28; (4) there was one student who did not understand the problem, did not have answers and varied and new ways, but did double check, namely code C16; (5) there were two students who understood the problem and had more than one answer, but the methods were not varied and new, and did not double-check, namely codes C22 and C30. For data on creative problem-solving abilities of representative students of class VII-B for problem number two is presented in the following table:

Table 10. Data on student’s creative problem-solving abilities in class VII-B for problem number 2.

| No. | Student Code | Step 1 (Understanding the problem) | Step 2 (Devising a plan) | Step 3 (Carry out the plan) | Step 4 (Looking back) |
|-----|--------------|-----------------------------------|--------------------------|-----------------------------|------------------------|
| 1   | B04          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 2   | B05          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 3   | B09          | Not understand the problem        | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 4   | B10          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 5   | B13          | Not understand the problem        | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 6   | B14          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 7   | B15          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 8   | B16          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 9   | B17          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 10  | B22          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 11  | B23          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 12  | B25          | Not understand the problem        | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 13  | B26          | Not understand the problem        | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 14  | B28          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |

Based on the data table for class VII-B students above, it is known that: (1) there are eight students who understand the problem, have more than one answer and double-check, but do not have a new and varied way, namely codes B04, B05, B10, B14, B15, B22, B23, and B28; (2) there were four students who did not understand the problem, did not have more than one answer and did not have various and new ways but did double check, namely codes B09, B13, B25, and B26; (3) there is one student who
understands the problem and checks again but does not have the answer and a new and varied method, namely code B16; (4) there is one student who understands the problem but does not have an answer and a new and varied way and does not double-check, namely code B17. As for the data on creative problem-solving abilities of the VII C-grade students for problem number 2 can be seen in the following table:

Table 11. Data on student’s creative problem-solving abilities in class VII-C for problem number 2.

| No. | Student Code | Step 1 (Understanding the problem) | Step 2 (Devising a plan) | Step 3 (Carry out the plan) | Step 4 (Looking back) |
|-----|--------------|-----------------------------------|--------------------------|---------------------------|------------------------|
| 1.  | C04          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 2.  | C05          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 3.  | C06          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 4.  | C08          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 5.  | C11          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 6.  | C12          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 7.  | C14          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 8.  | C15          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 9.  | C16          | Not understand the problem        | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 10. | C20          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 11. | C21          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 12. | C22          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 13. | C26          | Understand the problem            | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 14. | C27          | Understand the problem            | Fluency                  | Not flexible and not novelty | Not re-check           |
| 15. | C28          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 16. | C30          | Understand the problem            | Not Fluency              | Not flexible and not novelty | Do a re-check          |

Based on the data table for class VII-C students above, it is known that: (1) there are five students who understand the problem, have more than one answer and double-check, but the way to solve it is not varied and not new, namely codes C04, C05, C11 C15, C26; (2) there were three students who understood the problem but did not have the answers and varied and new ways and did not double-check, namely codes C06, C08, C14; (3) there were six students who understood the problem and checked again, but did not have the answers and varied and new methods, namely codes C12, C20, C21, C22, C28, C30; (4) there was one student who did not understand the problem, had more than one answer and checked again, but the way of solving it did not vary and was new, namely code C16;
(5) there is one student who understands the problem and has more than one answer, but the way to solve it is not varied and not new and does not double check, namely code C27. For data on creative problem-solving abilities of representative students of class VII-B on problem number 3 can be seen in the following table:

**Table 12.** Data on student’s creative problem-solving abilities in class VII-B for problem number 3.

| No. | Student Code | Step 1 (Understanding the problem) | Step 2 (Devising a plan) | Step 3 (Carry out the plan) | Step 4 (Looking back) |
|-----|--------------|------------------------------------|--------------------------|-----------------------------|-----------------------|
| 1.  | B04          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 2.  | B05          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 3.  | B09          | Not understand the problem         | Not Fluency              | Not flexible and not novelty | Do a re-check         |
| 4.  | B10          | Not understand the problem         | Not Fluency              | Not flexible and not novelty | Do a re-check         |
| 5.  | B13          | Not understand the problem         | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 6.  | B14          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Not re-check          |
| 7.  | B15          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 8.  | B16          | Not understand the problem         | Not Fluency              | Not flexible and not novelty | Not re-check          |
| 9.  | B17          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Do a re-check         |
| 10. | B22          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 11. | B23          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 12. | B25          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check         |
| 13. | B26          | Not understand the problem         | Not Fluency              | Not flexible and not novelty | Do a re-check         |
| 14. | B28          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Do a re-check         |

Based on the data of class VII-B students above, information was obtained that: (1) there were six students who understood the problem, had more than one answer, checked again, but did not have varied and new methods, namely codes B04, B05, B15, B22, B23, B25; (2) there were three students who did not understand the problem, did not have various answers and solutions, but did double check, namely codes B09, B10, B26; (3) there is one student who does not understand the problem and does not have a new and varied solution, but has more than one answer and checks again, namely code B13; (4) there is one student who understands the problem, but does not have various answers and methods and does not double check, namely code B14; (5) there were two students who understood the problem and checked again but did not have the answers and varied and new methods, namely code B17 and B18; (6) there was one student who did not understand the problem, did not have answers and varied and unique ways and did not double-check, namely code B16. For data on creative problem-solving abilities of representative students of class VII-C on problem number 3 can be seen in the following table:
Table 13. Data on student’s creative problem-solving abilities in class VII-C for problem number 3.

| No. | Student Code | Step 1 (Understanding the problem) | Step 2 (Devising a plan) | Step 3 (Carry out the plan) | Step 4 (Looking back) |
|-----|--------------|------------------------------------|--------------------------|-----------------------------|------------------------|
| 1.  | C04          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 2.  | C05          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 3.  | C06          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 4.  | C08          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 5.  | C11          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 6.  | C12          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 7.  | C14          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 8.  | C15          | Understand the problem             | Fluency                  | Not flexible and not novelty | Do a re-check          |
| 9.  | C16          | Not understand the problem         | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 10. | C20          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 11. | C21          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 12. | C22          | Understand the problem             | Fluency                  | Less flexible and not novelty| Not re-check           |
| 13. | C26          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 14. | C28          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Not re-check           |
| 15. | C29          | Understand the problem             | Not Fluency              | Not flexible and not novelty | Do a re-check          |
| 16. | C30          | Understand the problem             | Fluency                  | Not flexible and not novelty | Not re-check           |

Based on the data of class VII-C students above, information is obtained that: (1) there are five students, namely the code to understand the problem, have many answers and double-check, but do not have varied and new solutions, namely codes C04, C05, C11, C14, and C15; (2) there were four students who understood the problem, but they did not have the answers and various and new solutions and did not double-check, namely codes C06, C08, C20, C28; (3) there were four students who understood the problem and checked again, but did not have the answers and varied and new methods, namely codes C12, C21, C26, C29; (4) there was one student who did not understand the problem and did not have various answers and solutions, but did double check, namely code C16; (5) there is one student who understands the problem and has more than one answer and the method is less flexible and new and does not double-check, namely code C22; (6) there is one student who understands the problem and has more than one answer, but the way to solve it is not varied and new and does not double-check, namely code C30.
4. Conclusion

Based on the research data, it is concluded that the preliminary study of students’ problem-solving creativity is low and is level 1 or hardly creative. Therefore, one of the efforts that will be made to improve students’ creative problem-solving abilities is by implementing learning using comic-based learning modules based on realistic mathematics approach for students.

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