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Analysis of Creativity Among Elementary School Children in Solving Two-Dimensional Shape Problems in Grade V

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ABSTRACT

Thinking is a skill to create something new, as a skill to create new ideas that can be implemented by someone. Creative thinking skills can be interpreted as a thought process to produce a wide variety of ideas. Creative thinking skills play an important role in mathematics, because a student with creative thinking is able to solve mathematical problems. Indicators of creative thinking skills are skills in creating many ideas (fluency), skills in creating various ideas (flexibility), and skills in creating new ideas (originality). This study aims to analyze the creativity of elementary school children in solving two-dimentional figure problems. The approach used in this research is a qualitative approach with a descriptive method. The subjects of this study were fifth grade students at the Omah Sinau Tutoring Institute which consisted of 10 students. From the data analysis, it can be said that students' mathematical creative thinking skills are still low and they still lack of ideas.

Keywords: Creative thinking, Fluency, Flexibility, Originality

INTRODUCTION

Creative thinking is one of the 21st-century thinking skills that are important to develop. Therefore, learning in schools must equip students with creative thinking skills. To meet the demands of real world needs, learning mathematics must also provide many opportunities for students to develop creative thinking. Pehkonen defines creative thinking as a combination of divergent and logical thinking (Siswono, 2010). Divergent thinking is related to the ability to find many ideas to solve problems, whereas logical thinking is needed to examine these ideas to produce creative solutions.

Leikin (2011), Munandar (2009), Silver (1997), Siswono (2010), Waynberg and Leikin (2010) state the characteristics of creative thinking skills, namely having: 1) Expertise in creating many ideas (fluency), 2) Skill in creating diverse ideas (flexibility), and 3) Skill in creating new ideas (originality). Indicators of creative thinking in these studies are 1) Skill in creating many ideas, such as: (a) Making many ideas, many answers, many problem solving, many good statements; (b) Making many ways and suggestions for carrying out various activities; (c) Designing more than one answer; 2) Expertise in creating various ideas, such as: (a) Generating various ideas, answers or questions; (b) Seeing a problem from different points of view; (c) Looking for many ways of solving; (d) Can change the way of thinking; 3) Expertise in creating new ideas, such as: (a) Can create new exciting ideas; (b) Creating a unique way; (c) Can combine the completion process in accordance with the part.

Creative thinking is a type of high-level thinking that requires basic understanding, reasoning, and critical thinking. Therefore, creative thinking can be a challenge for students. Learning that promotes creativity can be carried out at all school levels in all contexts of learning materials. Elementary school-level students should get many learning experiences that support critical thinking so that at the next level, they can internalize this way of thinking in the context of more abstract and high-level material. However, many math learning practices only prioritize one correct answer without allowing students to think of other ways of solving problems (Sumartini, 2019; Novilanti & Suripah, 2021). Learning that focuses on a single correct answer can support less divergent thinking. Therefore, learning in elementary schools needs to present many open problems with many answers and the right way to solve them.

This study aims to describe elementary school students' creativity level in two-dimentional (flat) shape material. Rahayuningsih et al. (2021) stated that open-ended problem-solving questions are an effective assessment tool for assessing the processes and results of critical thinking. In this study, we used a form of open-ended questions that were used to identify the extent of students' mathematical creative thinking skills. The questions covered all three indicators of students' creative thinking skills: fluency, flexibility, and originality. In the test questions that we use, we only focus on one material, making it easier to analyze or assess the level of creative thinking skills of each student. By knowing the description of each student's creative thinking skills, it is hoped that the teacher will be able to evaluate future learning by considering learning designs that support students' thinking skills.

METHOD

This study used a qualitative approach with data collection methods through tests and interviews. Qualitative research aims to understand the phenomena experienced by research subjects Moleong (2007: 6). The subjects of this study were fifth-grade students at the Omah Sinau Tutoring Institute, which consisted of 10 students. The instrument used is a student's thinking skill test, shown in Figure 1. The student's creative thinking skills test consists of one question that contains solutions related to two-dimentional shape material. The indicators of creative thinking skills used in this study are fluency, flexibility, and originality.

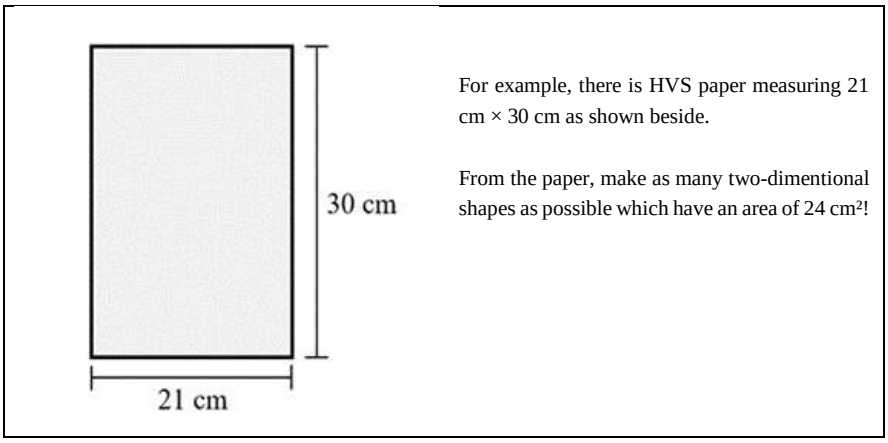


Figure 1. Creative thinking skills test instrument

Table 1. Scores of Students' Mathematical Creative Thinking Assessment

Indicators	**Score**
Expertise in creating many ideas (Fluency)	4
Expertise in creating diverse ideas (Flexibility)	4
Expertise in creating new ideas (Originality)	4
Total	**12**

RESULTS AND DISCUSSION

Analysis of students' creative thinking skills is based on an assessment of skills in creating many ideas (Fluency), skills in creating various ideas (Flexibility), and skills in creating new ideas (Originality). Below are the scores obtained from 10 students in tests of students' creative thinking skills in fluency, flexibility, and originality.

Table 2. Student Scores in Mathematical Creative Thinking

Score	**Number of Student**	**Note**
12	1	Very good
9	2	Good
6	5	Moderate
3	2	Not good
0	0	No answer
Total	**10**	

From Table 2, out of 10 students, only one student is included in the very good creative thinking skills classification. Students who are classified as very good can create many ideas (Fluency), create various ideas (Flexibility), and create new ideas (Originality). Two students were in a good category in creative thinking skills because they succeeded in creating many ideas, but there were a few mistakes in implementing them. Five students got the moderate category in solving creative thinking questions because they had shown more than one idea but also made many mistakes. Meanwhile, two students were not good at creative thinking skills, only showing rectangular and triangular shapes. Examples of student responses will be explained as follows.

Student SA's response (score 12)

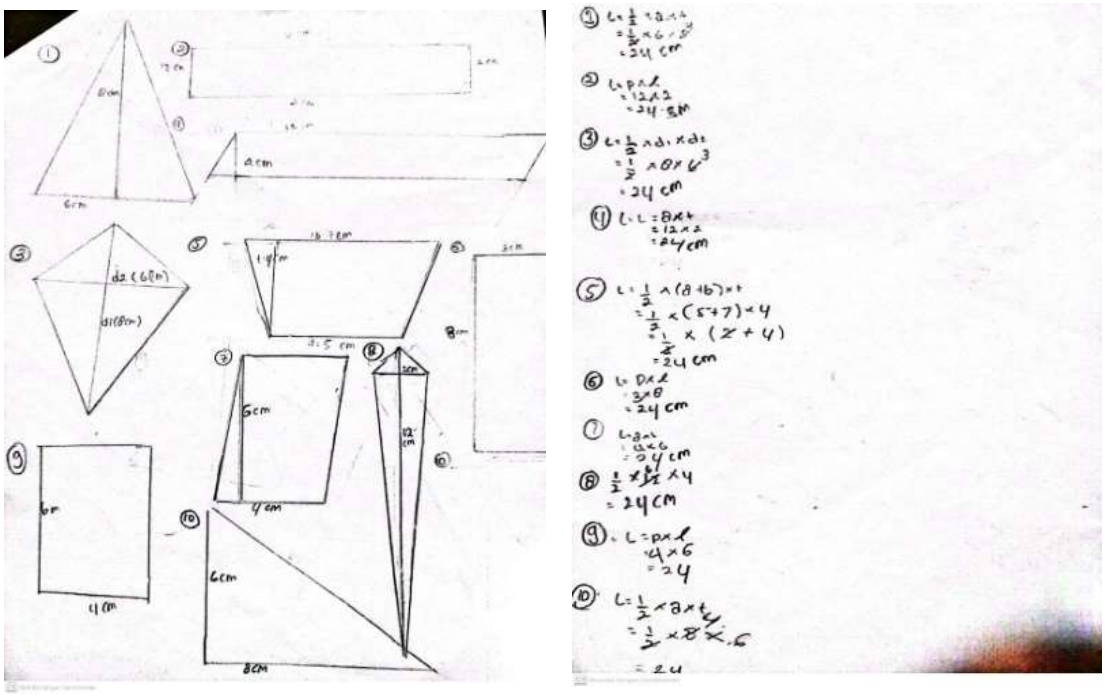


Figure 2. Student SA's Written Responses

From Figure 2, it can be seen that students have understood the questions fully. Students give answers by drawing two-dimentional shapes with various shapes and sizes. Students can determine the size of each side of each plane shape, affecting the results of calculating the area of the two-dimentional shape according to what is asked. Students can also provide evidence of conformity in size between each two-dimentional figure and the size listed. It can be concluded that students are able to provide many ideas, various ideas, and new ideas.

Student SB's response (score 6)

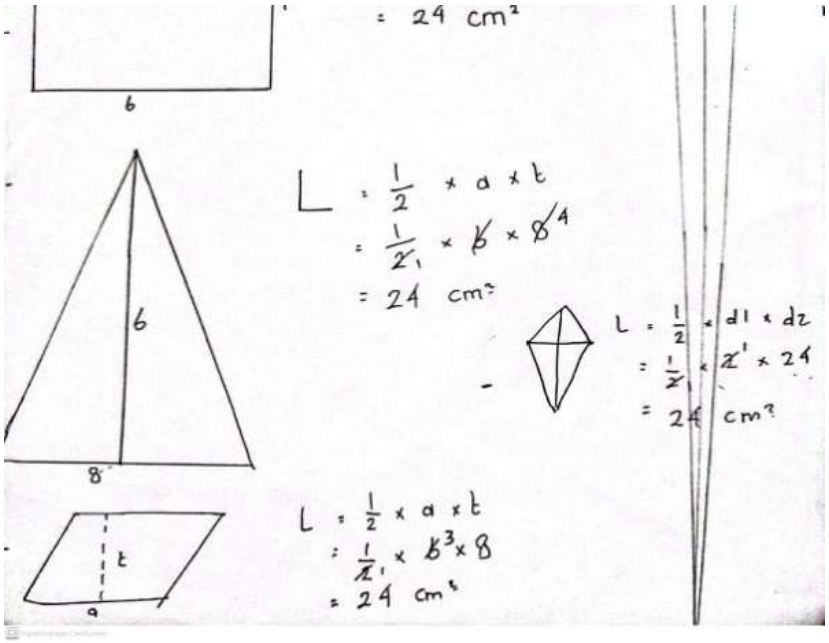


Figure 3. Students SB's Written Responses

From Figure 3, it is known that students are able to draw four kinds of two-dimentional shapes, namely rectangles, triangles, kites, and parallelograms, and can calculate the area of each two-dimentional shape. However, when drawing two-dimentional shapes, the unit size scale between images is not appropriate or inconsistent.

Response of students SC and SD (score 3)

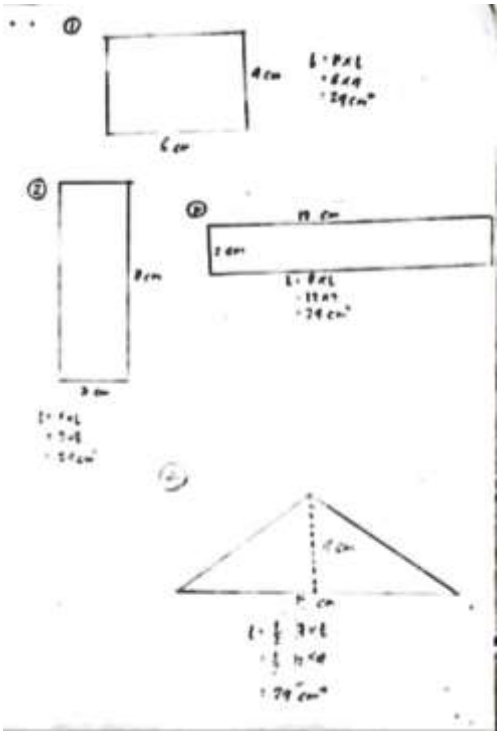
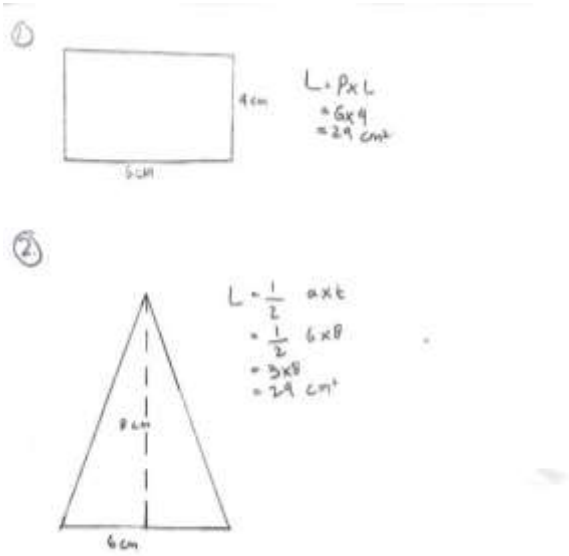


Figure 4. Students SB's Written Responses

From Figure 4, it is known that students can understand the purpose of the questions given. Students try to solve using a variety of ideas by drawing the same shape with different sizes, and students can determine the size of each side of the two-dimentional shape to match the area size requested in the problem.



Gambar 5. Respon Tertulis Siswa SC

From Figure 5, it is also known that students only give two different answers to the order to draw as many two-dimentional shapes as possible in the question. SC students chose the two-dimentional shapes most frequently used in routine questions, namely rectangles and isosceles triangles.

This study's findings align with previous studies' results, showing difficulties in achieving creative thinking (Yayuk et al., 2020; Puspitasari et al., 2019). The low level of student creativity in this study can be caused by a low level of students' mathematical abilities. Subur (2013) stated that the higher the students' mathematical ability level, the higher their creativity. The learning method experienced by students will also affect the level of student creativity. Mrayyan (2016) states that to improve critical thinking skills, teachers need to use various learning methods, such as divergent questions, motivational

questions, and brainstorming. The ability to think creatively in mathematics can also be improved through learning methods with problem-solving (Hendriana & Fadhilah, 2019) and problem-posing with manipulative media (Ulfah et al., 2017), contextual learning (Toheri et al., 2020).

CONCLUSION

From the results of the discussion of students' mathematical creative thinking skills, it can be obtained that the average student cannot meet the indicators of creative thinking. Many students only make 2 or 3 pictures from the command to make as many two-dimentional shapes as listed in the problem. The analysis of student responses concluded that students' mathematical creative thinking skills at LBB Omah Sinau were still relatively low. Therefore, students need to be familiarized with learning that supports creative thinking skills, for example, by presenting open-ended questions or learning methods involving open-ended questions.

This study has limitations on the number of subjects studied and the scope of the material in the context of mathematical problems. The results of this study also still focus on the products of students' creative thinking yet provide an in-depth understanding of the creative process. Therefore, further research is needed to describe the processes and results of creative thinking on various characteristics and different scopes of material.

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