
ANALYSIS OF STUDENTS' MATHEMATICAL CREATIVE THINKING ABILITY ON SOLVING GEOMETRY PROBLEMS

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ABSTRACT

Creative thinking in mathematics plays a crucial role in developing students' problem-solving abilities and adaptability, especially in the face of increasingly complex real-world challenges. Despite its importance, many students still struggle to generate diverse and original mathematical solutions. This study aims to analyze the mathematical creative thinking abilities of Grade VII students at SMPN 5 Darangdan in solving two-dimensional geometry problems. A qualitative descriptive method was employed in this study. Data were collected from 30 randomly selected students through a written test consisting of four open-ended questions. Each question was designed to assess one of the four indicators of mathematical creative thinking: fluency, flexibility, originality, and elaboration. The students' responses were analyzed to determine the percentage of achievement in each indicator, and categorized based on predetermined criteria. The results revealed that the average scores for fluency and flexibility were both 45%, indicating moderate performance in generating and applying various ideas. Originality was achieved by 29% of the students, while elaboration was the weakest area with only 3% of students demonstrating detailed problem-solving steps. These findings suggest that students tend to rely on familiar methods and rarely explore alternative or unique strategies. In conclusion, the students' overall creative mathematical thinking ability remains low, particularly in elaboration and originality. There is a clear need for instructional approaches that foster deeper reasoning, innovation, and multiple solution pathways in mathematics education.

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INTRODUCTION

In the 21st century and the era of Industry 5.0, creative thinking has become a fundamental skill required for solving real-life problems, especially in the field of mathematics. Mathematical Creative Thinking Ability (MCTA) allows students not only to understand and apply

mathematical concepts but also to generate multiple solutions, propose original ideas, and elaborate on their reasoning processes. The development of MCTA is essential for fostering innovation and adaptability in students, equipping them to face complex and dynamic challenges in the modern world.

Despite its recognized importance, students in various parts of the world, including Indonesia, continue to show limitations in creative mathematical thinking. A study by Moza, Sesanti, and Marsitin (2020) revealed that over 30% of students failed to meet the Minimum Competency Criteria (KKM) despite arriving at correct final answers, as they often relied on standard methods and failed to demonstrate flexible, original, or detailed thinking. This issue is further exacerbated by traditional instructional methods that emphasize rote learning and correct final answers rather than exploration and explanation.

In Indonesia, the implementation of the Kurikulum Merdeka provides a momentum to enhance students' higher-order thinking skills, including creativity in mathematics. However, many teachers still focus on routine problems and have limited resources or training to support open-ended and creative tasks. Consequently, students are rarely exposed to problems that encourage divergent thinking or multiple solutions.

Prior studies (Effendi & Farlina, 2017; Moma, 2015; Sitorus & Masrayati, 2016) have consistently highlighted four key indicators of MCTA: fluency (the ability to generate multiple relevant ideas), flexibility (the ability to use various strategies), originality (the ability to propose unique solutions), and elaboration (the ability to explain ideas in detail). Yet, these studies also reveal that elaboration and originality are the weakest indicators among students.

Preliminary findings from SMPN 5 Darangdan support this trend. Our observations indicated that students often provided repetitive answers, failed to articulate their thought processes, and relied heavily on procedural memory rather than conceptual understanding. These issues underline the need to examine the current state of students' MCTA in geometry problems.

Therefore, this study aims to analyze the mathematical creative thinking abilities of seventh-grade students at SMPN 5 Darangdan, specifically in solving problems related to two-dimensional geometry. The analysis focuses on four indicators of MCTA: fluency, flexibility, originality, and elaboration. This research is expected to provide insights for educators on the areas that need improvement and suggest more effective instructional strategies to enhance MCTA in junior high school students.

METHOD

This study used a qualitative descriptive method aimed at describing and analyzing the creative mathematical thinking ability (MCTA) of students in solving geometry problems. The approach was chosen to provide a detailed and in-depth understanding of students' thought processes based on open-ended tasks. The participants in this study were 30 Grade VII students from SMPN 5 Darangdan, selected randomly during the odd semester of the 2022–2023 academic year. The main research instrument was a written test consisting of four open-ended questions, each designed to assess one of the four MCTA indicators: fluency, flexibility, originality, and elaboration. Each question required students to solve a geometry problem related to two-dimensional figures (flat shapes) using diverse reasoning and explanation.

The research steps followed were:

1. Designing test items that represent each MCTA indicator.
2. Validating the test through expert judgment and pilot testing.
3. Administering the test in-class under teacher supervision.

4. Collecting and categorizing student responses.
5. Identifying and coding answers based on creativity indicators.

For data analysis, each student's answer was scored on a scale of 0 to 4 for each indicator. The percentage of student performance for each indicator was calculated using the formula:

$$P = \frac{n}{N} \times 100\%$$

With the information P is the number of error percentages, n is the number of students answer the question, and N is the number of all students. Determine the percentage percentage criteria The errors experienced by students are seen by the Mathematical Creative Thinking Ability indicator researchers refer to (Siregar, 2019).

Table 1. Criteria for Mathematical Creative Thinking Ability

Range	Interpretation
85,1% - 100%	Very Creative
70,1% - 85%	Creative
50,1% - 70%	Less Creative
0% - 50%	Not Creative

This method allowed the researcher to observe which aspects of creative thinking were most and least developed among the students

RESULTS AND DISCUSSIONS

Results

This study aimed to analyze the mathematical creative thinking ability (MCTA) of Grade VII students at SMPN 5 Darangdan in solving geometry problems, particularly on two-dimensional figures. The students' performance was assessed through four open-ended questions, each representing one of the four indicators: fluency, flexibility, originality, and elaboration.

Table 2. Description of fluency indicators

Score	Total Score Obtained by Students	Percentage
0	0	0%
1	0	0%
2	5	16%
3	12	39%
4	14	45%

For the fluency indicator, 45% of students scored the highest, indicating an ability to generate several solutions. However, their approaches lacked variation and were often similar in structure. This suggests surface-level fluency without conceptual depth.

Question 1 : Fluency

Paman akan membuat sebuah taman yang berbentuk segitiga namun paman belum menentukan ukurannya. Jika besar salah satu sudutnya adalah 20° , maka tentukan besar sudut yang lainnya dan gambarlah segitiga tersebut! (Berikan lebih dari satu jawaban)!

Jawaban 1
 Segitiga ABC, $\angle A = 20x^\circ$
 Misal $x = 1$ maka $\angle A = (20 \cdot 1)^\circ = 20^\circ$
 Sudut 20° .
 Segitiga sama kaki $\angle B$ ✓
 $= \angle C$ dan besar Sudut $20^\circ + (\angle B + \angle C)$
 $= 180^\circ$
 $(\angle C + \angle C) = 180^\circ - 20^\circ$
 $2 \cdot \angle C = 160^\circ$
 $\angle C = 80^\circ$

Jawaban 2
 Segitiga siku siku
 Sudut 20° maka
 ? langka

Belum mampu menyelesaikan soal dgn lebih dari 1 jawaban

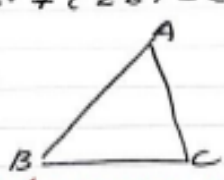


Figure 1. Student Response to Question 1 (Fluency Indicator)

which was designed to assess the fluency indicator, revealed that some students were capable of producing multiple valid answers to geometry problems involving two-dimensional figures. However, although 14 students (45%) achieved the highest score, many of them did not vary their strategies significantly. Their responses often differed only in numerical values or object dimensions while still following the same method. Moreover, several students provided answers without sufficient explanation or justification, indicating that their fluency lacked conceptual depth.

These findings align with Effendi and Farlina (2017), who stated that fluency in mathematics involves the ability to produce several relevant and diverse ideas. In our study, while students showed surface-level fluency, they rarely explored broader possibilities. This limited variation may stem from instructional practices that prioritize correct answers over exploratory thinking, as also noted by Putra et al. (2018).

Table 3 Description of flexibility indicators

Score	Total Score Obtained by Students	Percentage
0	0	0%
1	1	3%
2	7	23%
3	9	29%
4	14	45%

In the flexibility indicator, 45% of students again scored the highest, showing the ability to solve problems correctly. Yet, many relied on only one familiar method, lacking diversity in strategy, and often failed to justify their answers.

Question 2 : Flexibility

Pak Samsudin akan menutupi lantai ruangan kelas yang berukuran $12\text{ m} \times 12\text{ m}$ dengan keramik. Toko Berkah menyediakan keramik dengan berbagai macam ukuran diantaranya :

Tipe I berukuran $50\text{ cm} \times 50\text{ cm}$ dengan harga satuan Rp.8000 tipe II berukuran $40\text{ cm} \times 40\text{ cm}$ dengan harga satuan Rp.6000 dan tipe III berukuran $25\text{ cm} \times 25\text{ cm}$ dengan harga satuan Rp.4000

a. Andaikan lantai ruang kelas ingin dipasang menggunakan tiga tipe keramik tersebut. Uraikan beberapa cara yang mungkin dengan ketentuan setiap tipe keramik yang digunakan tidak kurang dari 16 cm^2

b. Keramik yang manakah yang membutuhkan biaya minimal? Berikan alasannya!

Diketahui : ruang kelas ukuran $12\text{ m} \times 12\text{ m}$
 Ditanyakan : tipe keramik yang digunakan tidak kurang 16 cm^2 dan biayanya ?

Jawab :

a. Tipe 1 = $50\text{ cm} \times 50\text{ cm} = 2500\text{ cm}^2$
 $= 2500\text{ cm}^2 \div 10.000$
 $= 0,25\text{ m}^2$ ✓

Tipe 2 = $40\text{ cm} \times 40\text{ cm} = 1600\text{ cm}^2$
 $= 1600\text{ cm}^2 \div 10.000$
 $= 0,16\text{ m}^2$ ✓

Tipe 3 = $25\text{ cm} \times 25\text{ cm} = 625\text{ cm}^2$
 $= 625\text{ cm}^2 \div 10.000$
 $= 0,0625\text{ m}^2$ ✓

b. $\frac{1,44\text{ m}^2}{0,25} = 576$ keramik
 $= 576 \times \text{Rp } 8.000 = \text{Rp } 4.608.000$

$\frac{1,44\text{ m}^2}{0,16} = 90$ keramik
 $= 90 \times \text{Rp } 6.000 = \text{Rp } 5.400.000$

Tipe II

Belum mampu memberikan alasan yang mampu membuat kesimpulan.

Figure 2. Student Response to Question 2 (Flexibility Indicator)

which assessed the flexibility indicator, measured students' ability to apply different strategies in solving geometry problems. The results show that 14 students (45%) achieved the highest score, indicating a satisfactory level of flexibility. However, a closer examination of their answers reveals that while some students did solve the problems correctly, they often relied on only one familiar method and failed to demonstrate variation in their approaches. Several student responses lacked diversity in strategy, showing that although they could reach the correct solution, they did so by following the same step-by-step process taught in class. Few students were able to shift perspectives or present alternative solution paths. Moreover, many did not provide justifications or reasoning to support their answers, which reduced the depth of their flexibility.

These findings are in line with Moma (2015), who stated that flexibility involves the ability to approach a problem using different strategies or solution pathways. The limitations observed in this study suggest that students may not be encouraged enough to experiment with different methods or explore less conventional problem-solving techniques. This may be due to overemphasis on getting the "right" answer quickly rather than nurturing a flexible mindset in mathematics.

Table 4. Description of Originality Indicators (Originality)

Score	Total Score Obtained by Students	Percentage
0	1	0%
1	0	0%
2	10	32%
3	11	39%
4	9	29%

For originality, only 29% of students achieved the highest score. Most responses were conventional, with students using standard procedures and showing little novelty in ideas. This indicates that originality remains underdeveloped in their mathematical reasoning.

Question 3 : Originality

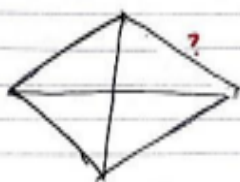
Diketahui belah ketupat ABCD dengan luas 360 cm^2

a. Gambarlah belah ketupat ABCD tersebut pada koordinat XOY dengan caramu sendiri lalu jelaskan bagaimana cara memperolehnya !

b. Ajukan dua pertanyaan lain yang berhubungan dengan belah ketupat ABCD, kemudian jawablah pertanyaan tersebut !

Diketahui, belah ketupat ABC dengan luas 360 cm^2

a.



Kalem mampu memberikan pertanyaan lain yg berhubungan belah ketupat ✓

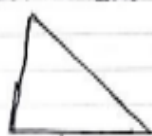
Cara memperoleh
Menentukan panjang sisi dengan satu dan dua
kemudian menghitung luas

$$= \frac{1}{2} \times d_1 \times d_2$$

$$= \frac{1}{2} \times 120 \times 60$$

$$= \frac{1}{2} \times 7200$$

$$= 360 \text{ cm}^2$$



lengkap jawaban !

Figure 3. Student Response to Question 3 (Originality Indicator)

evaluated the originality indicator by requiring students to present unique or uncommon solutions when solving problems related to two-dimensional shapes. The data revealed that only 9 students (29%) achieved the highest score for this indicator. The majority of responses showed little to no novelty; students frequently repeated strategies seen in previous examples or class instruction. Many students failed to offer original interpretations of the problem. Some even restated known formulas or shapes without modifying or applying them in new contexts. Furthermore, the students generally did not attempt to create new problem variations or extend their thinking beyond the immediate task. This suggests a heavy reliance on memorized procedures rather than generating fresh, creative ideas.

This result supports Effendi and Farlina (2017), who noted that originality requires students to introduce new ideas or perspectives not typically seen in standard responses. In this study, student responses largely reflected conventional problem-solving behavior, highlighting a limited capacity for innovation in mathematical thinking. This issue may stem from the lack of opportunities provided during instruction to encourage divergent thinking or open-ended exploration. Additionally, Moza et al. (2020) emphasized that originality tends to be underdeveloped when students are only trained to replicate methods without reflecting on how they can be applied differently. This matches the findings in our context, where creativity appears constrained by formulaic learning environments.

Table 5. Decryption of the Elaboration indicator (elaboration)

Score	Total Score Obtained by Students	Percentage
0	9	29%
1	1	3%
2	20	65%
3	0	0%
4	1	3%

Elaboration scored the lowest among all indicators, with only 3% achieving the highest mark. Most students provided partial or minimal explanations, and many failed to clearly articulate their reasoning or show step-by-step problem-solving processes.

Overall, the highest-performing indicators were fluency and flexibility, followed by originality, while elaboration remained the weakest. These results suggest that while some students can generate and apply ideas, they struggle significantly in expressing those ideas in a structured and original manner.

Question 4 : Elaboration

Pak Saleh memiliki sebidang tanah berbentuk persegi panjang. Sebidang tanah tersebut terbagi menjadi 4 bagian. Perbandingan luas daerah A ke luas daerah B adalah 2: 5. Sedangkan perbandingan luas daerah C ke luas daerah D adalah 3: 2

a) Perbedaan luas antara daerah A dan B adalah 30 m^2 . Pak Saleh berpendapat bahwa keliling dari sebidang tanah tersebut adalah 50 m dengan lebar yaitu 10 m. Buktikan pendapat Pak Saleh benar atau salah dan berikan alasanmu!
 b) Kerjakan soal (b) menggunakan cara lain!

0. luas daerah A dan B = 30 m^2
 maka luas AB = $\frac{\text{jumlah } (A+B) \times \text{seluruh A dan B}}{\text{jumlah A-B}}$
 luas AB = $\frac{5+2 \times 30}{5-2} = 70 \text{ m}^2$

Figure 4. Student Response to Question 4 (Elaboration Indicator)

targeted the elaboration indicator, which measures the extent to which students can explain their reasoning in detail and in a structured, logical manner. Among all four indicators, elaboration received the lowest score, with only 1 student (3%) achieving the maximum level. Most students (65%) scored 2, meaning they provided partial explanations but failed to elaborate their answers fully. 29% of students left their answers incomplete or gave minimal justification.

A deeper analysis of student responses revealed that most answers lacked supporting steps, explanations, or diagrams that could clarify their reasoning. Many students gave short, direct answers without showing how they arrived at the solution. This suggests that while some students may have had correct answers in mind, they lacked the ability or perhaps the habit of expressing their thinking process in a thorough and structured way.

This aligns with Effendi and Farlina (2017), who stated that elaboration involves detailing ideas and building connections within a solution process. The failure to articulate step-by-step reasoning could be linked to limited practice with open-ended problems or the absence of explicit instruction on mathematical communication.

Ratnasari and Setiawan (2007) also pointed out that students often face difficulties in elaborating their reasoning due to conceptual confusion and low confidence in verbalizing mathematical ideas. In our study, this was evident from vague responses and a lack of process-based explanation, reinforcing the need for instructional strategies that emphasize not just the result, but also how to clearly express the path taken to get there.

Discussions

The results of this study are consistent with previous findings on students' mathematical creative thinking ability (MCTA). The moderate performance in fluency and flexibility (each at 45%) aligns with studies by Effendi and Farlina (2017) and Putra et al. (2018), who found that students can often generate relevant responses and apply familiar strategies, but struggle to develop varied or innovative approaches. These similarities suggest that Indonesian students may not be adequately challenged to go beyond routine problem-solving.

The low performance in originality (29%) is also reflected in research by Moza et al. (2020), who observed that students often rely on memorized methods and lack the ability to generate new or uncommon ideas. Similarly, Leikin (2009) noted that originality in mathematical thinking is rarely encouraged in conventional classrooms where emphasis is placed on accuracy rather than exploration. In the present study, students' answers mostly mimicked textbook procedures without extending or transforming concepts creatively.

Even more concerning is the finding that only 3% of students demonstrated strong elaboration skills. This supports the findings of Ratnasari and Setiawan (2007), who stated that students often struggle to explain their reasoning due to conceptual confusion and low confidence in communicating mathematical ideas. Suripah and Retnawati (2019) emphasized that elaboration should be nurtured through instructional strategies that require students to verbalize their thinking, justify steps, and connect concepts. The current results suggest that these practices are not yet common in the observed classroom.

Overall, this study confirms that the areas of originality and elaboration are persistently weak and should be the focus of future instructional development. Integrating open-ended tasks and emphasizing process-based learning can bridge the gap between students' current performance and the creative competencies required in mathematics education.

CONCLUSION

This study concludes that the mathematical creative thinking ability (MCTA) of Grade VII students at SMPN 5 Darangdan is still in the low to moderate range. Based on the results of four indicators—fluency, flexibility, originality, and elaboration—it was found that while students showed moderate strength in fluency (45%) and flexibility (45%), they struggled considerably in originality (29%) and especially in elaboration (3%). These findings highlight a significant gap in students' ability to express ideas creatively and communicate mathematical reasoning in detail.

The low performance in elaboration and originality suggests that classroom practices may not yet fully support the development of higher-order thinking skills. Most students relied on familiar methods and did not engage in varied or innovative strategies when solving geometry problems. Furthermore, their difficulty in articulating step-by-step reasoning indicates a need for structured guidance in mathematical communication.

Based on these findings, it is recommended that teachers integrate more open-ended and non-routine problems into mathematics instruction. Emphasis should be placed on encouraging students to explore multiple strategies, express ideas in detail, and reflect on their own reasoning. Additionally, classroom activities that foster discussion, collaboration, and creativity can help nurture a learning environment where students feel confident and motivated to think beyond standard procedures. Future research should explore interventions or instructional models that specifically target improvements in elaboration and originality among junior high school students.

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REFERENCES

- Effendi, R., & Farlina, E. (2017). Pengembangan kemampuan berpikir kreatif matematis melalui pembelajaran open-ended. *Jurnal Pendidikan Matematika*, 11(1), 21–35. <https://doi.org/10.22342/jpm.11.1.4065.21-35>.
- Haylock, D. W. (1997). Recognizing mathematical creativity in schoolchildren. *ZDM*, 29(3), 68–74. <https://doi.org/10.1007/s11858-997-0002-y>.
- Herman, T., & Sukoriyanto. (2017). Mathematical creative thinking ability based on gender differences. *Jurnal Pendidikan Matematika*, 11 (1), 41–56. <https://doi.org/10.22342/jpm.11.1.4071.41-56>.
- Kusumah, Y. S., & Nurhasanah, S. (2017). Enhancing students' mathematical creative thinking ability through the 5E learning cycle model. *International Journal on Emerging Mathematics Education*, 1(1), 1–10. <https://doi.org/10.12928/ijeme.v1i1.5741>.
- Leikin, R. (2009). Exploring mathematical creativity using multiple solution tasks. *ZDM Mathematics Education*, 41(1), 95–104. <https://doi.org/10.1007/s11858-008-0114-4>.
- Moma, R. (2015). Kemampuan berpikir kreatif matematis siswa melalui pembelajaran berbasis masalah. *Jurnal Pendidikan Matematika*, 4(1), 22–31. <https://doi.org/10.36709/jpm.v4i1.1234>.
- Moza, A., Sesanti, L., & Marsitin, R. (2020). Analisis kemampuan berpikir kreatif siswa dalam menyelesaikan soal matematika. *Jurnal Edukasi Matematika*, 8(2), 95–104. <https://doi.org/10.29407/jem.v8i2.14759>.
- Neenan, M., & Dryden, W. (2018). Enhancing problem-solving and creativity in mathematics education. *Educational Psychology in Practice*, 34(1), 37–49. <https://doi.org/10.1080/02667363.2017.1367911>.
- Prayudho, P. T. (2023). Analisis kemampuan berpikir kreatif matematis siswa dengan penerapan problem based learning. *Jurnal Pendidikan Matematika*, 1(2), 1–10. <https://doi.org/10.31227/osf.io/kz95q>.

- Putra, Z. H., Sari, I. N., & Rahmawati, D. (2018). Analisis kemampuan berpikir kreatif matematis siswa SMP dalam menyelesaikan soal bangun datar. *Jurnal Pendidikan Matematika*, 7(1), 55–63. <https://doi.org/10.22342/jpm.7.1.4562.55-63>.
- Ratnasari, E., & Setiawan, A. (2007). Kesulitan siswa dalam menyelesaikan soal cerita matematika. *Jurnal Pendidikan Matematika*, 1(2), 115–122. <https://doi.org/10.21831/jpm.v1i2.3823>.
- Silver, E. A. (1997). Fostering creativity through instruction rich in mathematical problem solving and problem posing. *ZDM*, 29(3), 75–80. <https://doi.org/10.1007/s11858-997-0003-x>.
- Simamora, R. E., & Kamara, J. G. (2024). Unlocking mathematical creativity: How students solve open-ended geometry problems. *Jurnal Pendidikan MIPA*, 25(1), 66–86. <https://doi.org/10.23960/jpmipa/v25i1.pp66-86>.
- Siregar, R. (2019). Kemampuan berpikir kreatif matematis siswa SMP dalam menyelesaikan soal HOTS. *Jurnal MathEdu*, 4(2), 89–98. <https://doi.org/10.20961/math.v4i2.10124>.
- Sitorus, J., & Masrayati. (2016). Students' creative thinking process stages: Implementation of realistic mathematics education. *International Education Studies*, 9(9), 11–20. <https://doi.org/10.5539/ies.v9n9p11>.
- Suparyanta, T., Muklis, R., & Omegawati, R. (2018). Analisis kesulitan siswa dalam menyelesaikan soal bangun datar. *Jurnal Ilmu Pendidikan*, 12(1), 43–51. <https://doi.org/10.22236/jip.v12i1.3467>.
- Suripah, S., & Retnawati, H. (2019). Strategi pembelajaran untuk mengembangkan berpikir kreatif dalam matematika. *Jurnal Riset Pendidikan Matematika*, 6(2), 223–235. <https://doi.org/10.21831/jrpm.v6i2.26132>.
- Suripah, S., & Stephani, I. (2017). Indikator kemampuan berpikir kreatif matematis. *Jurnal Pendidikan Matematika*, 5(1), 14–26. <https://doi.org/10.22342/jpm.5.1.4078.14-26>.
- Yolanda, N. (2021). Matematika sebagai ilmu dasar dalam pengembangan teknologi. *Jurnal Sains dan Teknologi*, 6(2), 87–94. <https://doi.org/10.25077/jst.v6i2.781>.
- Zenth, N., & Suparman, A. (2018). Analisis kemampuan berpikir kreatif siswa SMP dalam menyelesaikan soal matematika. *Jurnal Inovasi Pendidikan Matematika*, 9(3), 123–132. <https://doi.org/10.21831/jipm.v9i3.21100>.