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The Creative Thinking Ability of MTs Students in Solving One Variable Linear Inequality Problems Viewed from Mathematics Anxiety

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ABSTRACT

This study aims to describe the creative thinking abilities of Madrasah Tsanawiyah (MTs) students in solving problems in the material of one variable linear related to the level of mathematical anxiety. The approach used was qualitative descriptive involving three students from class VIII of MTs Al-Ibrohimi Gresik who were selected by purposive sampling based on low, moderate, and high levels of mathematical anxiety. The research instruments included a mathematical anxiety questionnaire, a mathematical creative thinking ability test, and interview guidelines. Based on the results of data analysis, students with low anxiety levels showed fulfillment of the four indicators of creative thinking, namely fluency, flexibility, originality, and elaboration so that they were classified in the category of very creative. Participants with moderate anxiety met two indicators, namely flexibility and elaboration, which indicated a sufficient level of creativity. Meanwhile, students with high anxiety only met one indicator, namely flexibility, and were classified as less creative. The findings from the three research subjects show a tendency for creative thinking skills to decline as the level of mathematical anxiety increases during problem solving.

Keywords: *Creative thinking skills, Problem Solving, Mathematical Anxiety*

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INTRODUCTION

Mathematics is fundamentally a discipline rooted in problem solving, aimed not only at imparting numerical competence but also at cultivating students' higher order thinking skills. These skills are instrumental in equipping students to confront a wide spectrum of problems, both abstract and concrete, ranging from theoretical constructs to real world challenges encountered in everyday life. As students engage with mathematical content, they frequently encounter obstacles particularly when confronted with non-routine, unfamiliar, or complex problems that require more than rote memorization or algorithmic application (Nurkamilah & Afriansyah, 2021). In such situations, creative thinking emerges as a critical cognitive tool that enables students to navigate difficulties, think beyond conventional methods, and generate effective solutions. Within the domain of mathematics, creative thinking can be defined as the capacity to produce ideas that are novel, original, flexible, and useful in resolving mathematical tasks. This ability transcends simple recognition of patterns or the mechanical application of learned procedures, it involves constructing innovative approaches, reinterpreting problems from different angles, and elaborating on ideas in meaningful ways. In the context of 21st century education, where interdisciplinary integration and innovation are increasingly emphasized, nurturing the creative thinking abilities of students is crucial. As noted by Pradiarti et al. (2024), mathematical creative thinking is characterized by four principal indicators: fluency (the ability to generate multiple solutions), flexibility (the ability to approach problems from diverse perspectives), originality (the ability to offer unique responses), and elaboration (the ability to expand and refine ideas with depth).

At the Madrasah Tsanawiyah (MTs) level equivalent to lower secondary education students are generally in a transitional stage of cognitive development, as they move from Piaget's concrete operational stage toward the formal operational stage (Asdar & Barus, 2023). In this stage, learners begin to demonstrate foundational abilities in abstract reasoning, hypothetical thinking, and deductive logic. As such, mathematics instruction during this developmental window should not merely emphasize procedural fluency and formulaic problem solving, but also actively engage students in tasks that stimulate analytical reasoning and creative exploration. One mathematical topic that holds particular promise for fostering such abilities is the study of one variable linear inequality. This topic not only introduces students to the application of algebraic reasoning but also presents opportunities for them to interpret, model, and solve problems that can be related to real-life contexts. According to Nuranggraeni et al. (2020), solving problems involving one-variable linear inequality requires both procedural competence and the ability to explore multiple, effective solution pathways. Such tasks are well-suited for encouraging students to think creatively, especially when presented in contextual or open-ended formats.

Despite its pedagogical potential, however, empirical evidence suggests that many MTs students struggle with tasks involving linear inequality particularly when such problems are presented in the form of story problems or real-world scenarios. These difficulties point not only to gaps in conceptual and procedural understanding but also to deficiencies in creative problem-solving abilities. Numerous studies have highlighted this concern. For example, Mulyadi et al., (2024) reported that only 8% of students demonstrated a high level of creative thinking in mathematics, while the vast majority fell into medium (24%) or low (68%) categories. Similarly, research by Laksono & Effendi (2021) revealed that only 13% of students were categorized as highly creative, whereas an overwhelming 84% exhibited low levels of mathematical creativity. These findings underscore the urgent need to investigate the underlying factors that may be impeding the development of creative thinking in mathematics classrooms.

One such factor is mathematics anxiety a psychological condition marked by feelings of tension, worry, or dread that arise when individuals engage with mathematical tasks. Mathematics anxiety has been found to interfere with students' cognitive functioning, particularly in areas related to working memory, logical reasoning, and strategic thinking (Dewi & Simamora, 2022). When students experience heightened anxiety, especially when dealing with open-ended or challenging problems, they often become less inclined to take intellectual risks, explore alternative strategies, or engage deeply with the problem all of which are essential components of creative thinking. Pramesti et al., (2024) found that students with elevated levels of mathematics anxiety exhibited lower performance on tasks requiring divergent thinking, such as generating multiple problem-solving approaches or developing original mathematical models. These patterns suggest that math anxiety not only hampers academic performance but also inhibits the creative capacities that are crucial for effective mathematical thinking.

Irhamna et al., (2020) demonstrated that mathematics anxiety has a significant negative impact on students' mathematical problem-solving abilities. Their study found that math anxiety alone contributed 8.5% to the variance in problem-solving performance, indicating a measurable hindrance to students' ability to engage with tasks that require deeper reasoning and non-routine thinking. Similarly, a broader global analysis by Lau et al., (2022) revealed that both individual and contextual levels of math anxiety stemming from classroom or school environments exert a detrimental influence on students' mathematics achievement. Elevated anxiety levels were consistently linked to reduced performance, with environmental factors such as teacher attitudes and peer dynamics further exacerbating students' disengagement and limiting their cognitive flexibility.

Given the importance of creative thinking in solving one variable linear inequality problems which demand original thought and diverse solution strategies it is essential to examine more closely the relationship between mathematics anxiety and creative thinking ability. While numerous studies have investigated these two constructs independently, the existing literature tends to address them in isolation: either by focusing on the cognitive aspects of creative thinking or the affective influences of mathematics anxiety. For instance, Suren & Kandemir (2020) emphasized the negative impact of mathematics anxiety on general learning outcomes and math achievement, while Rahayuningsih et al., (2021) and Yayuk et al., (2020) explored how students develop creative thinking through open-ended mathematical problems. However, there remains a notable gap in research that directly investigates the interrelation between mathematics anxiety and mathematical creative thinking, especially within specific content areas such as one-variable linear inequalities. Moreover, very few studies have examined this issue at the Madrasah Tsanawiyah (MTs) level a critical stage in cognitive development where students begin to transition from concrete to abstract reasoning, and where creative thinking should be actively nurtured. Despite its pedagogical potential, the topic of one variable linear inequality has rarely been utilized as a context for exploring mathematical creativity.

Therefore, this study fills an important research gap by integrating the constructs of mathematics anxiety and mathematical creative thinking within a well defined mathematical content domain. It aims to provide a nuanced understanding of how affective factors shape cognitive performance. By combining cognitive and affective dimensions through qualitative analysis, the study offers novel insights that can inform curriculum design and instructional practices, ultimately fostering both mathematical creativity and emotional resilience in learners.

METHODS

This study uses a qualitative method with a descriptive approach. The research subjects consisted of three students in grade VIII at MTs Al-Ibrohimi Manyar-Gresik, selected based on their levels of mathematical anxiety: low, medium, and high. The instruments in this study included a questionnaire to identify the level of mathematical anxiety, a test to assess and classify students' creative thinking abilities, and interview guidelines designed to deepen the data obtained from the tests and questionnaires through further exploration of the subjects' responses. The mathematical anxiety questionnaire was adapted from the undergraduate thesis of Lailiyah (2021), while the creative thinking test and interview guidelines were adapted from the thesis of Rizqiyati & Kumala (2023). Both instruments have undergone content validation by subject matter experts. These instruments were applied in this study with necessary adjustments to language and context to suit the characteristics of Madrasah Tsanawiyah (MTs) students. The original studies had already established their validity and reliability, which this study utilizes as a basis for instrument selection.

Mathematical Anxiety Questionnaire

The mathematical anxiety questionnaire consists of 20 questions/statements that include three components of anxiety, namely cognitive (thinking), affective (attitude), and physiological (physical reaction), as described in Table 1 (Lailiyah, 2021).

Table 1. Characteristics of Mathematical Anxiety

Mathematical Emergency Components	Characteristic
Cognitive (Thinking)	The appearance of a negative mindset
	Inability to focus thoughts or experience emptiness in thinking
Affective (Attitude)	Fear of being judged as incompetent by others
	Doubts about one's capacity to complete tasks
	Decreased self-confidence
Physiological (Physical reaction)	The body's response is in the form of excessive sweating
	Onset of nausea
	Increased heart rate
	The appearance of muscle tension or a tense body condition

In this study, the levels of mathematical anxiety among students were assessed by computing the average score from the questionnaire, then grouped into three categories as listed in Table 2.

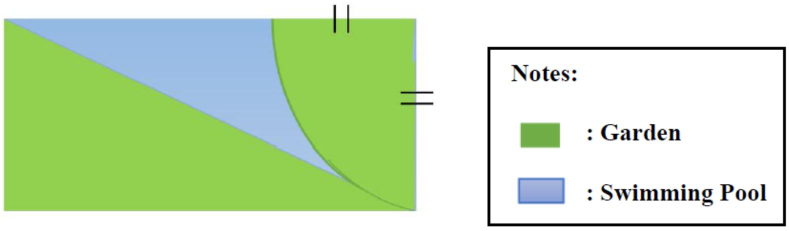
Table 2. Mathematical Anxiety Levels

No.	Percentage Score	Mathematical Anxiety Levels
1.	$25\% < P \leq 50\%$	Low
2.	$50\% < P \leq 75\%$	Moderate
3.	$75\% < P \leq 100\%$	High

Creative Thinking Ability Test

The test consists of 1 question of one variable linear inequality material which requires students to determine the possible area of the swimming pool from the available land form, taking into account the combination of several flat buildings. An illustration of the question can be seen in Figure 1.

An architect created a sketch to design a swimming pool with the shape shown below!



If the available land is $350x$ m², determine the possible area of the swimming pool that will be built!

Figure 1. Questions on Creative Thinking Ability of One Variable Linear Inequality Material

The indicators of mathematical creative thinking skills applied in this study are presented in Table 3.

Table 3. Indicators of Creative Thinking Ability

Aspect	Indicator
Fluency	Ability to generate at least two accurate and appropriate answers/ideas.
Flexibility	The ability to solve a problem using at least two different methods but still get the correct answer.
Originality	The ability to find solutions to a problem using distinctive/original methods.
Elaborative	Ability to formulate ideas or answers in detail by identifying known data, formulating problems, explaining the stages of solution, and drawing conclusions systematically.

Source from Guilford (in Pratiwi et al.)

After conducting a creative thinking ability test, the researcher categorized the students according to their test results. The classification of creative thinking levels is presented in Table 4.

Table 4. Creative Thinking Ability Level

Level	Criteria
Level 4 (very creative)	Students are able to demonstrate all components of creative thinking during problems solving process.
Level 3 (creative)	Students can exhibit three out of four elements of creative thinking in problems solving process.
Level 2 (quite creative)	Students can show two of the four creative thinking components during the problem solving process.
Level 1 (less creative)	Students are capable of demonstrating only one aspect of creative thinking in problem solving process.
Level 0 (non-creative)	Students are unable to show any components of creative thinking in the problem solving process.

Source from Widiansyah (in Syifa' et al.)

RESULTS AND DISCUSSION

The researcher directly (face-to-face) collected the data in this study from April 18 to 19, 2025 in class VIII MTs Al-Ibrohimi, Gresik Regency. The process began with the provision of a mathematical anxiety questionnaire to all students in grade VIII and continued with the implementation of a creative thinking ability test. Based on the mathematical anxiety questionnaire, three students will be selected by purposive sampling as the subject of this study with the following description.

Table 5. Research Subject

Initials Name	Percentage of Questionnaire Score (%)	Mathematical Anxiety Levels
AH	61.67%	Low
NF	58.33%	Moderate
MS	48.33%	High

According to Table 5, the results from the mathematical anxiety questionnaire analysis involving three students indicated that one of them exhibited a low level of anxiety accounting of 48.33%, one student had moderate anxiety with a percentage of 58.33%, and one student had high anxiety with a percentage of 61.67%. Furthermore, the researcher gave a mathematical creative thinking ability test to the three subjects, then the test results will be categorized as presented in Table 6 below.

Table 6. Category Creative Thinking Students

Initials Name	Creative Thinking Category
AH	Creative
NF	Quite Creative
MS	Less Creative

Furthermore, the analysis results concerning the creative thinking abilities of subjects with low, moderate, and high anxiety levels will be presented based on the indicators that have been determined as follows.

AH Subject: Creative Thinking Ability in Students with Low Mathematical Anxiety

The following presents the results of the responses and analysis of AH Subject in addressing the problem of a one variable linear inequality, based on the indicator of creative thinking ability.

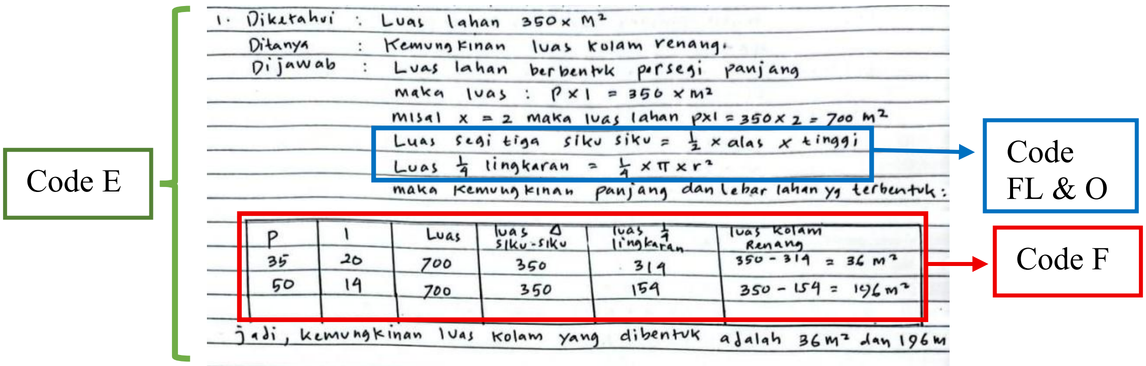


Figure 2. Excerpt of AH Subject's Answer

Table 7. Description of Creative Thinking Ability of AH Subject

Aspects of Creative Thinking	Description
Fluency (F)	The AH subject shows the fluency aspect by proposing two possible land sizes, namely 35×20 and 50×14. Each of these sizes results in a different pool area, namely 36 m² and 196 m². This shows that the subject is capable of generating multiple alternative solutions. The following is a snippet from the interview between the researcher and the AH subject that supports the fluency aspect. Researcher: How do you determine the size of the land for the pond?

Aspects of Creative Thinking	Description
Flexibility (FL)	AH Subject: I tried several possible lengths and widths, such as 35 by 20 and 50 by 14, so that I could compare the area of the pool later. The AH subject demonstrates the aspect of flexibility by using two types of plane figures right triangles and quarter circles to construct a pool model based on the visual sketch provided in the problem. This indicates that the subject is able to adapt their solution strategy to the characteristics of the problem. The following is an excerpt from the interview between the researcher and the AH subject that supports the flexibility aspect. Researcher: Why did you choose to use triangles and quarter circles in your pool model? AH Subject: At first, I wanted to use a rectangle, but when I looked at the picture, the pool wasn't a regular square. So, I used a triangle for the corner and a quarter circle for the curved part.
Originality (O)	The AH subject demonstrates the aspect of originality by interpreting the image in the problem as a combination of geometric shapes, specifically by incorporating the element of a quarter circle even though this shape is not explicitly mentioned in the problem. This indicates that the subject is capable of generating ideas that are uncommon and innovative. The following is a snippet from the interview between the researcher and the AH subject that supports the originality aspect. Researcher: Have you ever worked on a problem with a pool shape like this before? AH Subject: Never, Sis. But when I saw the picture, I thought it looked like a circle cut at the corner, and I imagined it as a quarter circle. So I tried to use it even though the problem didn't say what shape it was.
Elaborative (E)	The AH subject demonstrates the aspect of elaboration by presenting the solution process in a concise yet thorough manner. The subject not only writes down the solution steps systematically, but also creates a comparison table to analyze two alternative land sizes. This indicates attention to detail, logical connections between steps, and an effort to convey concepts clearly. The following is a snippet from the interview between the researcher and the AH subject that supports the elaboration aspect. Researcher: How did you determine how to solve this problem? AH Subject: First, I looked for a suitable formula for each part of the pool. Then, I calculated them one by one and wrote down the steps to avoid confusion. After that, I created a comparison table between the two sizes to clearly identify which one is more suitable, ensuring it has the same area as the pool. That way, it's easier to analyze.

Based on the analysis of the answer sheets and interviews, the subject AH demonstrated a very high level of mathematical creative thinking ability. This is evident from the fulfillment of all four creativity indicators: fluency, flexibility, originality, and elaboration. The subject was able to generate two alternative swimming pool areas (36 m^2 and 196 m^2), demonstrating fluency in producing a variety of ideas. Flexibility is reflected in the use of different geometric shapes, such as right triangles and quarter circles, which are well adapted to the context of the problem. Originality is shown through the subject's unique and uncommon approach, while elaboration is evident from the systematic breakdown of steps and the creation of comparison tables. The significance of these findings is that high mathematical creative thinking ability is not solely determined by cognitive skills, but is also strongly influenced by affective factors such as math anxiety and students' confidence levels. When math anxiety is low, students feel more free to explore different solutions and ideas without the fear of making mistakes. This facilitates divergent thinking processes, enabling the emergence of new ideas, original approaches, and more in depth, systematic thinking. In other words, low anxiety functions as a psychological condition that supports the optimal development of mathematical creativity.

These findings align with recent research showing that students with low math anxiety tend to possess better creative thinking skills. For instance, Bahrudin & Siswono (2020) found that students with low levels of math anxiety are capable of creatively and systematically exploring various problem-solving strategies and generating diverse solution ideas. The confidence that arises in students with low anxiety allows them to think divergently without fear of being wrong, enabling the full expression of all creativity indicators. In summary, high mathematical creative thinking abilities are the result of a dynamic interaction between cognitive skills and affective states. Therefore, supporting students in managing math anxiety and building confidence is just as important as teaching math concepts, as it opens up opportunities for creativity and deeper learning engagement.

NF Subject: Creative Thinking Abilities in Students with Moderate Mathematical Anxiety

The following presents the results of the responses and analysis of NF Subject in addressing the problem of a one variable linear inequality, based on the indicator of creative thinking ability.

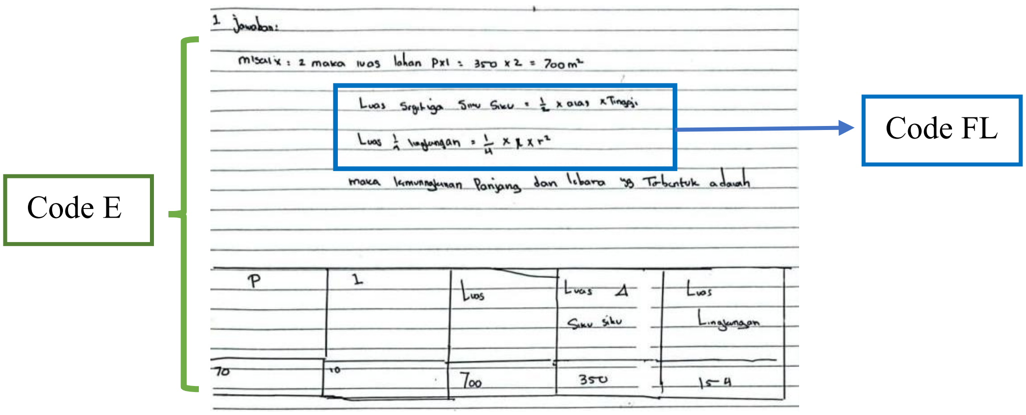


Figure 3. Excerpt of NF Subject's Answer

Table 8. Description of Creative Thinking Ability of NF Subject

Aspects of Creative Thinking	Description
Fluency (F)	The NF subject has not demonstrated the fluency aspect optimally, as they only tried one possible land size, namely 70 × 10. This indicates that the subject has not yet generated a variety of ideas or alternative solutions. The following is a snippet from the interview between the researcher and the NF subject that illustrates the subject's limitation in the fluency aspect. Researcher: How did you determine the size of the land for the pond? NF Subject: I just tried 70 by 10 right away so I could quickly find the area.
Flexibility (FL)	The NF subject demonstrates the aspect of flexibility by combining two types of plane figures triangles and circles in constructing a model of the pond's shape. Although this combination is not explained in depth, it reflects the subject's effort to adapt their strategy to the visual characteristics of the problem. The following is an excerpt from the interview between the researcher and the NF subject that supports the flexibility aspect. Researcher: Why did you choose to use triangles and circles to represent the pond?

Aspects of Creative Thinking	Description
Originality (O)	NF Subject: Because the shape of the pond looks like a triangle with a circle, so I just used those two. The NF subject has not demonstrated the aspect of originality prominently, as they used a conventional approach by applying the basic formulas for the area of a triangle and a quarter circle without modification or introducing new ideas. The subject tended to follow commonly used solution patterns. The following is a snippet from the interview between the researcher and the NF subject that illustrates the subject's limitation in the originality aspect. Researcher: Have you ever tried any other method besides the basic formula to solve this problem? NF Subject: I usually solve problems like this using the formula for the area of a triangle and a quarter circle, so I used the same method.
Elaborative (E)	The NF subject writes down the basic formulas and presents a possible calculation in the form of a table. However, the subject has not provided a detailed or systematic explanation of the solution steps. The following is a snippet from the interview between the researcher and the NF subject that illustrates the elaboration aspect. Researcher: How did you structure the calculation steps? NF Subject: I wrote the formula so I wouldn't forget, and then I immediately entered the numbers into the table.

Based on the results of the analysis of answer sheets and interviews, NF subjects showed mathematical creative thinking skills at a moderate level, which was characterized by the fulfillment of two indicators of creative thinking, namely flexibility and elaboration. The subject is able to combine two flat shapes a triangle and a circle that are adapted to the shape of the pool in the image. This shows flexibility in shape selection and a visual spatial approach that is adaptive to the context of the problem. In addition, the subject also compiles information in the form of a table and includes basic formulas, which reflect elaboration, namely the ability to develop and organize ideas in a structured manner, although still not systematic and less detailed. In contrast, two other indicators fluency and originality were not met. Subjects only proposed one alternative size (70 × 10), so they did not show sufficient fluency.

The approach used is also conventional without any new or unique ideas (originality). Therefore, subjects are categorized in Level 2 (quite creative). These findings are in line with the research of Pramesti & Malasari, (2024), which found that students in the "quite creative" category generally only meet one or two indicators of creative thinking especially flexibility or novelty but do not show fluency and originality. They also suggest that moderate-level math anxiety can limit fluency in thinking and inhibit the emergence of new ideas, although students are still able to demonstrate a variety of strategies in problem solving. The significance of these findings suggests that the ability to think mathematically is not only dependent on cognitive aspects, but is also strongly influenced by affective aspects, such as self-confidence and anxiety levels. When students feel insecure or afraid of making mistakes, they tend to stop at one solution and are reluctant to try another, thus hindering the development of fluency and originality. By implication, teachers need to create a learning environment that is safe, supportive, and respectful of the process of exploring ideas. Strategies such as open discussion, open-ended questioning, and appreciation for the diversity of answers can be ways to foster students' courage in creative thinking.

MS Subject: Creative Thinking Skills in Students with High Mathematical Anxiety

The following presents the results of the responses and analysis of MS Subject in addressing the problem of a one-variable linear inequality, based on the indicator of creative thinking ability.

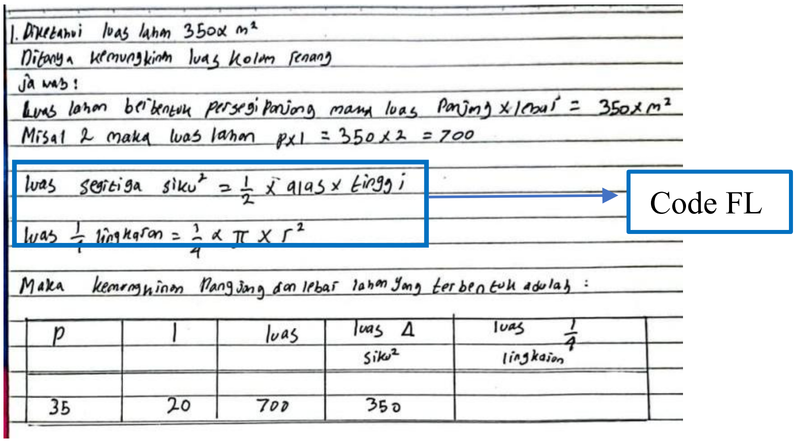


Figure 4. Excerpt of MS Subject's Answer

Table 9. Description of Creative Thinking Ability of MS Subject

	Description
Fluency (F)	The MS subject only tried one possible land size, namely 35 meters × 20 meters, to meet the land area requirement of 700 m². There was no apparent attempt to explore other sizes or alternatives. This indicates that the subject's ability to generate ideas or variations is still limited. The following is an excerpt from an interview between the researcher and the MS subject that highlights limitations in the fluency aspect. Researcher: How did you determine the size of the land for the pond? MS Subject: I immediately used 35 and 20 so I could quickly get the area, because I didn't think about other sizes.
Flexibility (FL)	The MS subject wrote formulas for two geometric shapes, namely a right triangle and a quarter circle, but only calculated the area of the triangle. This shows some flexibility in recognizing the geometric shapes of the pond, although further exploration of the use of both shapes was not pursued. The following is an excerpt from the interview between the researcher and the MS subject that supports the flexibility aspect. Researcher: Why did you choose to use triangles and circles to represent the pond? MS Subject: I saw that the pool was like a triangle and a semicircle, so I just wrote the two formulas, but I didn't have time to calculate the area of the circle.
Originality (O)	The MS subject used only the standard basic formulas, namely the area of triangles and circles, without exploring new approaches or different modeling techniques. The solution strategy employed does not demonstrate any distinctive features or uniqueness that would reflect creativity. The following is an excerpt from the interview between the researcher and the MS subject that highlights the limitations in the originality aspect. Researcher: Have you ever tried any method other than the basic formulas to solve this problem? MS Subject: I use the formulas for triangles and circles as usual, which are commonly taught in class.

	Description
Elaborative (E)	The MS subject wrote down the area formulas correctly and included a calculation of the land area of 700 m². However, the subject has not explained the steps to determine the height of the triangle or the radius of the circle, and has not done a complete calculation for the entire area of the pool. Although the subject listed the value of the triangle's area of 350 m², there is no explanation as to the origin of the triangle's height value. The subject only estimates high scores without being based on clear information from the question. This shows limitations in elaborating the settlement process in detail. The following is an excerpt of the interview between the researcher and MS subjects which shows the limitations in the detail aspect (elaborative). Researcher: How do you determine the height of the triangle and the radius of the circle in the pond? MS subject: I just wrote the formula first, then I don't know where the right height triangle comes from, so I guess it's like 20 high, then I immediately multiply 35, get 350. But I'm not sure that's true. If it's a circle, I stop because I don't know how much r is.

Based on the analysis of the answer sheets and interview data, the subject MS was classified at Level 1 (Less Creative), indicating a low or limited level of mathematical creative thinking ability. This classification is primarily because the subject only met one of the four key indicators of mathematical creativity: flexibility. The indicator of flexibility was observed when MS attempted to write down two relevant formulas related to flat shapes specifically, the area formula for a triangle and the area formula for a quarter circle. However, MS only proceeded to calculate one of these, showing an initial grasp of geometric concepts appropriate to the problem. This suggests that MS understands some fundamental geometric ideas but struggles to apply or expand these concepts into a full, diverse set of solutions. In contrast, fluency was not demonstrated, as MS offered only one alternative for the land's dimensions (35 × 20), which indicates a lack of variety or multiple approaches in solving the problem. Fluency in mathematical creativity means generating numerous ideas or solution paths, which MS did not display. Furthermore, MS did not meet the originality criterion. The strategies used were conventional and commonly known, showing a tendency to follow standard problem solving methods without venturing into novel or unique approaches. This reflects a cautious or routine mindset that often limits creative output. Regarding elaboration, MS failed to provide detailed explanations or systematic steps in solving the problem. Critical elements such as calculating the height of the triangle or the radius of the circle were missing, and the area calculation of the pond was incomplete. Elaboration involves breaking down the problem into detailed components and providing clear reasoning, which MS did not accomplish.

This finding is in line with the results of Dinawati & Siswono (2020) which highlights the negative impact of mathematical anxiety on creative thinking abilities. High math anxiety often inhibits students' willingness or ability to engage in divergent thinking the cognitive process that generates multiple possible solutions and is essential for creativity in mathematics. Students with elevated math anxiety typically exhibit low originality and elaboration because fear of errors, lack of confidence, and a preference for safe or familiar answers restrict their problem-solving flexibility. This anxiety creates a psychological barrier that hinders the exploration of alternative ideas or deeper analytical reasoning. In summary, MS's limited mathematical creative thinking ability reflects not just gaps in cognitive skills but is also likely influenced by affective factors such as anxiety and confidence. Addressing these affective components is crucial to help students unlock their creative potential and develop more flexible, original, and elaborate problem-solving skills.

CONCLUSION

Creative thinking is an important cognitive skill that students need to develop, especially when solving mathematical problems that require flexibility and innovation, such as one variable linear inequalities. The findings of this study demonstrate a clear relationship between students' levels of mathematical anxiety and their creative thinking abilities. Students with low levels of anxiety tend to solve problems more confidently, show a deeper understanding of mathematical concepts, and are capable of generating various solution strategies. They also tend to articulate their reasoning logically, clearly, and in detail. In contrast, students with high levels of anxiety often struggle to comprehend problems, produce only a single and underdeveloped solution, and hesitate to try alternative strategies due to fear of making mistakes or a lack of confidence in their mathematical abilities. Therefore, it can be concluded that students' creative thinking skills in solving mathematical problems are closely related to their emotional state particularly their level of anxiety toward mathematics.

In addition, this study discusses the practical implications of the findings. For teachers, the results can serve as a basis for designing instructional strategies that encourage idea exploration, allow room for mistakes as part of the learning process, and manage students' anxiety through a humanistic and supportive learning environment. For students, the findings emphasize the importance of building self-confidence in mathematical thinking and developing a positive outlook toward learning challenges. For policymakers, these findings highlight the need for educational policies that support the development of non-cognitive competencies such as emotional regulation and the courage to express ideas alongside cognitive achievement.

This study has several strengths, including the use of a qualitative approach that enables in depth exploration of students' thinking processes and the application of a comprehensive framework of four creative thinking indicators: fluency, flexibility, originality, and elaboration. However, there are also limitations that must be acknowledged. First, the sample was limited to three students from a single madrasah, selected through purposive sampling, which restricts the generalizability of the findings. Second, the absence of any intervention or treatment limits the ability to draw causal inferences between anxiety and creativity. Third, only one type of mathematical problem was used, which may not sufficiently represent the diverse contexts in mathematics where creative thinking is applied.

Future research could address these limitations by involving a larger and more diverse sample across multiple schools, employing a mixed-method or experimental design, and implementing targeted interventions aimed at reducing mathematical anxiety such as emotional regulation training, mindfulness practices, or growth mindset based instruction. Evaluating the effectiveness of such interventions would provide valuable insights into the relationship between students' affective states and the development of their creative thinking abilities. In conclusion, this discussion serves as a bridge between research findings and their practical contributions to the advancement of mathematics education and classroom practice.

REFERENCES

Asdar, M., & Barus, C. A. (2023). Analisis Perbandingan Perkembangan Kognitif Siswa SD dan SMP Berdasarkan Teori Piaget selama Pandemi COVID-19. *Jurnal Teknologi Pendidikan: Jurnal Penelitian Dan Pengembangan Pembelajaran*, *8*(1), 148. https://doi.org/10.33394/jtp.v8i1.5974

Bahrudin, E. R., & Siswono, T. Y. E. (2020). Mathematics Anxiety and Students' Creative Thinking Process in Solving Number Patterns Problems. *Journal of Mathematical Pedagogy*, *2*(1), 8–17. https://doi.org/https://doi.org/10.26740/jomp.v2n1.p%p

Dewi, S., & Simamora, R. (2022). Analisis Kecemasan Siswa pada Pembelajaran Matematika Berbasis Problem Based Learning di SMP Negeri 3 Kota Jambi. *Jurnal Ilmiah Dikdaya*, *12*(2), 368. https://doi.org/10.33087/dikdaya.v12i2.359

Dinawati, E. N., & Siswono, T. Y. E. (2020). Jurnal Penelitian Pendidikan Matematika dan Sains, 4(2), 83. https://doi.org/https://doi.org/10.26740/jppms.v4n2.p82-92

Irhamna, I., Amry, Z., & Syahputra, H. (2020). Contribution of Mathematical Anxiety, Learning Motivation and Self-Confidence to Student's Mathematical Problem Solving. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, *3*(4), 1759–1772. https://doi.org/https://doi.org/10.33258/birle.v3i4.1343

Lailiyah, N. (2021). Analisis Kemampuan Pemahaman Konsep Matematis Ditinjau Dari Kecemasan Matematis Siswa Kelas XI. Skripsi*, Universitas Islam Sultan Agung, Repository UNISSULA, 34*. https://repository.unissula.ac.id/24200/2/34201700004_fullpdf.pdf

Laksono, D., & Effendi, K. N. S. (2021). Kemampuan Berpikir Kreatif Matematis Siswa SMP Negeri di Kabupaten Karawang pada Materi Bangun Datar. *Jurnal Pembelajaran Matematika Inovatif*, *4*(3), 507–5016. https://doi.org/10.22460/jpmi.v4i3.507-516

Lau, N., Hawes, Z., Tremblay, P., & Ansari, D. (2022). *Supplementary Information for Disentangling the Individual and Contextual Effects of Math Anxiety: A Global Perspective*. https://doi.org/https://doi.org/10.1073/pnas.2115855119

Mulyadi, E., Yusuf, Y., & Yuliawati, L. (2024). Analisis Kemampuan Berpikir Kreatif Siswa SMP pada Materi Relasi dan Fungsi. *Jurnal Theorems (The Original Reasearch of Mathematics)*, *8*(2), 371–382. https://doi.org/https://doi.org/10.31004/cendekia.v7i3.2412

Nuranggraeni, E., Effendi, K. N. S., & Sutirna, S. S. (2020). Analisis Kemampuan Berpikir Kreatif Matematis Ditinjau dari Kesulitan Belajar Siswa. *JP3M (Jurnal Penelitian Pendidikan Dan Pengajaran Matematika)*, *6*(2), 107–114. https://doi.org/10.37058/jp3m.v6i2.2066

Nurkamilah, P., & Afriansyah, E. A. (2021). *Analisis Miskonsepsi Siswa pada Bilangan Berpangkat*. *10*(1), 49–60. https://doi.org/10.31980/mosharafa.v10i1.818

Pradiarti, R. A., Sudirman, S., & Sisworo, S. (2024). Kemampuan Berpikir Kreatif Siswa dalam Menyelesaikan Masalah Open Ended Materi Geometri. *Teorema: Teori Dan Riset Matematika*, *9*(1), 93–106. https://doi.org/10.25157/teorema.v9i1.12782

Pramesti, E. D., & Malasari, P. N. (2024). *Analisis Kemampuan Berpikir Kreatif Matematis ditinjau dari Mathematics Anxiety Siswa SMP*. *4*(2), 115–125. https://doi.org/https://doi.org/10.28918/circle.v4i2.7241

Pratiwi, G. D., Supandi, & Harun, L. (2021). *Profil Kemampuan Berpikir Kreatif Matematis Siswa Ditinjau Dari Kemandirian Belajar Kategori Tinggi*. *3*(1), 78–87. https://doi.org/http://dx.doi.org/10.26877/imajiner.v3i1.7184

Rahayuningsih, S., Sirajuddin, S., & Ikram, M. (2021). Using open-ended problem-solving tests to identify students' mathematical creative thinking ability. *Participatory Educational Research*, *8*(3), 285–299. https://doi.org/http://dx.doi.org/10.17275/per.21.66.8.3

Rizqiyati, A. M., & Kumala, F. Z. (2023). Analisis Proses Berpikir Kreatif Matematis Siswa dalam Menyelesaikan Masalah Matematika Persamaan dan Pertidaksamaan Linear Satu Variabel ditinjau dari Tipe Kepribadian Extrovert dan Introvert. *Symmetry: Pasundan Journal of Research in Mathematics Learning and Education*, *8*(1), 46–61. https://doi.org/10.23969/symmetry.v8i1.7081

Rohman, A. A., & Syifa', A. M. (2023). Analisis Kemampuan Berpikir Kreatif Guilford Berdasarkan Gaya Berpikir Siswa. *SQUARE: Journal of Mathematics and Mathematics Education*, *5*(2), 67–81. https://doi.org/10.21580/square.2023.5.2.18387

Suren, N., & Kandemir, M. A. (2020). The effects of mathematics anxiety and motivation on students' mathematics achievement. In *International Journal of Education in Mathematics*, 8(3). https://doi.org/https://doi.org/10.46328/IJEMST.V8I3.926

Yayuk, E., Purwanto, As'Ari, A. R., & Subanji. (2020). Primary school students' creative thinking skills in mathematics problem solving. *European Journal of Educational Research*, *9*(3), 1281–1295. https://doi.org/10.12973/eu-jer.9.3.1281