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Difference in Mathematical Creative Thinking Ability Students of MTs Negeri 7 Malang Reviewed by Gender

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Abstract

Creative thinking skills are crucial in modern education, driven by innovation demands and complex challenges, influenced by internal factors like motivation and emotional intelligence, and external factors like environment and gender. The research shows that female students have a higher level of mathematical creative thinking than male students, both in the learning process and learning outcomes. This study aims to analyze the differences in mathematical creative thinking ability of MTs Negeri 7 Malang students in terms of gender perspective. Creative thinking ability consists of several aspects, namely fluency, flexibility, originality, and elaboration. This research used a qualitative case study approach involving four students who were purposively selected based on teacher criteria, such as participation and test results, to represent diverse levels of engagement and performance. Data were collected through written tests and interviews to explore mathematical creative thinking skills. The results showed that female students were more detailed in answering questions, more flexible in adopting alternative approaches, and more thorough and systematic in developing answers. Male students tended to show stronger originality skills with unique answers based on personal logic. These findings suggest the importance of a more inclusive and effective learning approach that considers gender differences in creative thinking.

Keywords: *ability*; *creative thinking*; *gender*; *mathematics*

Abstrak

Kemampuan berpikir kreatif sangat penting dalam pendidikan modern, didorong oleh tuntutan inovasi dan tantangan yang kompleks, yang dipengaruhi oleh faktor internal seperti motivasi dan kecerdasan emosional, serta faktor eksternal seperti lingkungan dan jenis kelamin. Penelitian menunjukkan bahwa siswa perempuan memiliki tingkat berpikir kreatif matematis yang lebih tinggi dibandingkan siswa laki-laki, baik dalam proses pembelajaran maupun hasil belajar. Penelitian ini bertujuan untuk menganalisis perbedaan kemampuan berpikir kreatif matematis siswa MTs Negeri 7 Malang ditinjau dari perspektif gender. Kemampuan berpikir kreatif terdiri dari beberapa aspek, yaitu kelancaran, keluwesan, keaslian, dan elaborasi. Penelitian ini menggunakan pendekatan kualitatif jenis studi kasus yang melibatkan empat siswa yang dipilih secara purposif berdasarkan kriteria guru, seperti partisipasi dan hasil tes, untuk mewakili tingkat keterlibatan dan kinerja yang beragam. Data dikumpulkan melalui tes tertulis dan wawancara untuk mengeksplorasi kemampuan berpikir kreatif matematis. Hasil penelitian menunjukkan bahwa siswa perempuan lebih rinci dalam menjawab pertanyaan, lebih fleksibel dalam mengadopsi pendekatan alternatif, dan lebih teliti dan sistematis dalam mengembangkan jawaban. Siswa laki-laki cenderung menunjukkan kemampuan orisinalitas yang lebih kuat dengan jawaban yang unik berdasarkan logika pribadi. Temuan ini menunjukkan pentingnya pendekatan

pembelajaran yang lebih inklusif dan efektif yang mempertimbangkan perbedaan gender dalam berpikir kreatif.

Kata Kunci: berpikir kreatif; gender; kemampuan; matematika

INTRODUCTION

Creative thinking skills are increasingly recognized as an important element in modern education. In an era that demands innovation and flexibility, creative thinking is the key to dealing with complex problems that often arise in various fields of life (Siregar *et al.*, 2024). This is in line with the demands of the Ministry of Education and Culture that students are expected to be able to come up with new creative ideas in analyzing and solving problems.Creative thinking skills not only help students complete academic tasks in different ways, Fauziyah *et al* (2023) stated that this ability also prepares them to become problem solvers in the future. Zubaidah (2018) added that through the development of creative thinking, students are taught to generate new ideas that emphasize thinking "out of the box". Thus, the cultivation of creativity indirectly makes students understand that every problem can be solved with several different solutions.

According to Guilford (He, 2017) creative thinking is the ability to see a situation from various points of view and produce unconventional solutions and is fluent and flexible. In line with that, Dewi (2024) defines creative thinking ability as the ability to solve problems or produce something useful and new. In addition, Adriyana (Ummah, 2019) also defines creative thinking skills as originality, fluency, flexibility, and elaboration. Originality shows students' ability to generate unique ideas, while flexibility shows their ability to move from one approach to another in solving problems. Fluency refers to the ability to generate multiple ideas, and elaboration involves the ability to develop those ideas in detail.

In addition to these characteristics, creative thinking ability can be influenced by internal and external factors. Internal factors are aspects that come from within the individual such as personality, emotional intelligence, intrinsic motivation, and experience and knowledge, while external factors are things that come from outside the individual, such as the social, cultural and educational environment, facilities and resources, and external pressures or challenges (Jayanti *et al.*, 2020). One external factor that often has a strong influence is gender Squire (Retno, 2024).

Azisah *et al* (2018) define gender as the differences between men and women that are shaped by social and cultural constructions that define the roles, behaviors and traits considered appropriate for each gender, and these traits can change or replace each other. Gender differences often affect student interactions during the learning process, this can be seen from variations in class participation, learning styles, and students' ability to solve problems. Saputra & Santoso (2023) said that the social environment and gender expectations also play an important role, because they can affect confidence in expressing creativity. in line with that, Purwanto *et al* (2019) also stated that, there are differences in the way of thinking and solving math problems between male and female students.

In learning mathematics, creative thinking skills and gender are two important aspects that need to be considered. Based on the researcher's interview with the mathematics teacher at MTs Negeri 7 Malang, it was found that students' creative thinking ability is closely related to gender factors. The teacher revealed a striking difference between male and female students in the way they solve math problems. Male students tend to give short answers by relying on logic, such as directly mentioning the final result without explaining the calculation steps. In contrast, female students show higher accuracy by including detailed calculation steps. This can be seen from the daily test results which show that female students have an average score of 85, while male students obtained a score of 78, which indicates a difference in mathematical creative thinking ability between the two. Based on these findings, this study aims to determine the differences in mathematical creative thinking ability of MTs Negeri 7 Malang students in terms of gender, in order to provide deeper insights in supporting inclusive and effective learning.

METHODS

This research uses a qualitative approach with a case study type. According to Denzin and Licoln (Fadli, 2021), qualitative research aims to interpret phenomena by involving appropriate and detailed methods to understand the perspective of the individuals studied. The phenomenon referred to in this study, namely differences in students' mathematical creative thinking abilities based on gender. While the type of case study research was chosen, because according to Arikunto (Yanti & Qomarul Sholihah, 2024), case studies are carried out intensively, in detail and in depth on certain symptoms, so that researchers can find out more broadly about the phenomenon being studied. Case studies are well suited to exploring gender differences in mathematical creative thinking, as they allow researchers to explore the dynamics that emerge in groups of male and female students more comprehensively. This is in line with the opinion of Rusandi & Muhammad Rusli (2021) which states that case studies are research that has a special nature. Meanwhile Stake (Lexy, 2010) added that case studies aim to maximize understanding of specific cases, and are complex and simple.

The data collection method uses a written test in the form of questions that contain indicators of creative thinking (originality, fluency, flexibility, and elaboration), followed by an unstructured interview by asking questions verbally after students complete the written test that has been given in order to find out the extent of students' creative thinking skills in working on the test given.

This research data analysis uses Miles and Huberman's theory which consists of three stages, namely data collection, data presentation, and conclusion drawing. Scientific data reduction was carried out using the triangulation method. The intended reduction is to summarize relevant and important information, while data that is considered irrelevant will still be stored, but not analyzed at an early stage. Data that is not analyzed is kept as a backup, which may be useful if new relevant patterns or information are found at a later

date. This step aims to facilitate researchers in identifying differences in students' mathematical creative thinking abilities based on gender.

The subjects in this study were students of class VIII B at MTs Negeri 07 Malang. The sampling technique used Purposive Sampling, where the sample was selected based on the criteria set by the teacher. In this case, 4 students from class VIII B were selected as representatives of the research sample. The selected samples consisted of 2 male students and 2 female students. The objects examined in this study were students' answer papers and interview results related to integers. To ensure the validity of the data, researchers conducted a credibility test through method triangulation. Triangulation was carried out by comparing the results of students' written tests on small numbers with the interview data obtained. Thus, the comparison between these two data sources provides more validity to the research findings.

RESULTS AND DISCUSSION

The research was conducted at MTs Negeri 7 Malang with the subject of class VIII B students. In its implementation, the researcher gave a written test in the form of 4 questions with creative thinking skills to 2 male students and 2 female students chosen by the teacher. The results of the written test of students' mathematical creative thinking skills can be seen in Table 1.

Table 1. Mathematical Creative Thinking Ability Test Score							
Gender	Subjek	Fluency	Originality				
		(Question 1)	(Question 2)	(Question 3)	(Question 4)		
Male	R-1	25	0	25	25		
	R-2	25	25	25	10		
Female	R-3	25	25	25	10		
	R-4	25	25	25	25		

Based on Table 1, the results of the students' mathematical creative thinking ability test, the researcher then conducted interviews with the 4 subjects. The purpose of this interview is to understand the extent of students' mastery in mathematical creative

thinking skills. The following is a description of the test and interview results.

1. Fluency

× +2-3-4	2-3-4 =5						
7:10							
1)= 00	5	Walac Walac	secara secara	hifungon logiu a	bisa dilantci dilontoi	10 5	

Figure 1. Work Result R-1

Figure 1 shows that subject R-1 was able to provide an alternative idea by writing a number operation starting with the variable x as the beginning of the floor being stepped on, then using the addition and subtraction operators, resulting in a result on the 10th floor. In addition, subject R-1 also proposed two different assumptions to answer the problem, although the assumptions proposed two different answers. The first assumption "10th floor" and the second "5th floor" show students' efforts to understand the problem from various points of view. This shows that R-1 fulfills the fluency indicator. Strengthened by the results of the interview below.

P : *How did you get the idea to solve this problem?*

R-1 : Logic and my own calculations.

- *P* : Can you find an answer other than the one you wrote? If so, how?
- *R-1* : Yes, because it is based on logic.

Figure 2. Work Result R-2

Figure 2 shows R-2's answer, unable to fulfill the fluency indicator, because R-2 can only solve the problem with answers that match the information contained in the problem using one idea. This can be seen from the interview results below.

P : How did you get the idea to solve this problem?

R-2 : By adding some numbers, based on the last floor point, that is, what is the last point on the 5th floor, then adding the point on the 4th floor plus minus 3.

P : Can you find an answer other than the one you wrote? If so, how did you do it? *R*-2 : No.

1. 412 Diker Abi ngik 2 lantai Turun 3 dan 4. lalu dia berado di lantai s Ditanya lantai awal Abi Jawab 5 - 2 + 3 + 9 = 10

Figure 3. Work Result R-3

In Figure 3, it shows that R-3 was able to write the information correctly, and answered in a unique way by reversing the operator that should be + to -, and vice versa. The example is known to rise 2 floors, this shows that there is an addition to the floor, but the operation is replaced with (-). This shows that R-3 is able to fulfill the fluency

indicator, because R-3 solves using more than one idea. Strengthened by the results of the interview below.

- *P* : How did you get the idea to solve this problem?
- *R-3* : *Knowing what is known, and what is asked, then do it.*
- *P* : Are there any difficulties or obstacles to be able to solve problem number one?
- *R-3* : There was, at the beginning I was confused but when I reread it, I understood.
- *P* : Can you find an answer other than the one you wrote? If so, how?
- *R-3* : Yes, by reversing the numbers and operations.

D Posisi lantai chahir : === lantai s Naik pertama = 2 lantai turun pertama · 3 lantai -11-Kedua · 7 lantai Jadi : 5-2+3+9 = 10 Posisi awal berada di lantai 10

Figure 4. Work Result R-4

In Figure 4, it shows that subject R-4 fulfills the fluency indicator, this is evidenced by a single solution. However, R-4 can convey information clearly and answers gradually using other ideas. Reinforced by the answers to the interview results below.

- *P* : How did you get the idea to solve this problem?
- *R-4* : Previously I was confused, then I understood the information in the question and found it by flipping, and started working.
- *P* : Are there any difficulties or obstacles to be able to solve problem number one?
- *R-4* : Yes, I was a little confused, then re-understood, and finally understood.
- *P* : Can you find an answer other than the one you wrote? If so, how?
- *R-4* : Yes. By calculating the operation by likening the initial floor with x for example x + 2 3 4 = 10.

2. Flexibility

2) the bable

Figure 5. Work Result R-1

Figure 5, shows that subject R-1 was unable to provide an answer and only wrote numbers and operations that could not be understood. This shows that R-1 cannot fulfill the flexibility indicator. Strengthened by the results of the interview below.

P : Can you mention what is known and asked in question no. 2?

- *R-1* : *No*.
- *P* : *How can you write the answer like that?*
- *R-1* : *I* don't understand

2.22+3-5=2

Figure 6. Work Result R-2

Figure 6 shows R-2's clear answer. In the answer presented, R-2 was able to fulfill the flexibility aspect of processing and designing a number operation using numbers 1-6 and the operator presented. But in the solution, R-2 is very clear that he has not understood the information presented in the problem. This is reinforced by the results of the interview below.

- *P* : What do you think is known and asked about question number two?
- *R-2* : *How many numbers you have to get the number 2 and number operations.*
- *P* : So that's all that's known in the problem?
- *R-2* : No, the problem explains that solving using numbers 1-6, where the numbers used must be 4 and 3 operations from the given operation.
- *P* : From the given problem, what things must be solved first? tell me?
- *R-2* : Knowing the numbers used are the numbers given, and whether the result is really 2 by trial and error.
- *P* : How can you think of this way, where do you get references to solutions if the problem is like this?
- *R-2* : By using some of the available numbers with the existing operations with the goal of the result 2.
- *P* : Can you find a different way other than the one you wrote down?
- *R-2* : *No*.



In Figure 7, it shows that subject R-3 is able to understand the information contained in the problem. This is evidenced by the arrangement that contains 4 different numbers from 1 to 6, and uses 3 different operators. This shows that R-3 is able to fulfill the flexibility aspect, because R-3 is able to compose number operations using various numbers and operators contained in the problem and can find the same answer in other ways. Reinforced by the following interview results.

P : Can you mention what is known and asked in question no. 2?

- *R-3* : We know 1-6, and some operators $(+, \div, \times, ^)$, then find 4 different numbers with 3 operators with the result 2.
- *P* : Is that all that is known in the problem?
- *R-3* : Yes.
- *P* : From the given problem, what things should be solved first? Tell me!
- *R-3* : Find 3 operators from $(+, \div, \times, ^)$, and 4 different numbers from 1-6 and the result will be 2.
- *P* : How did you come up with this method, where did you get the reference for the solution if the question is like this?
- *R-3* : Paying attention to the result and composing the number operation according to the information.
- *P* : Can you find a different way other than the one you wrote down?
- *R-3* : Yes, by maybe doing the addition, subtraction or multiplication first.



Figure 8. Work Result R-4

In Figure 8, it shows that subject R-4 solves with several numbers and operators that vary according to the information contained in the problem and produces the right answer. This can be interpreted that R-4 can fulfill the flexibility indicator, namely composing an operation with various operators and numbers that have been presented as alternative solutions to the problem. Reinforced by the results of the interview below.

- *P* : What do you think is known and asked about question number two?
- *R-4* : Given 1-6, and some operators, then told to make an addition or subtraction operation with 4 different numbers and 3 different operators whose result is 2.
- *P* : So that's all that is known in the problem?
- *R-4* : Yes.
- *P* : From the given problem, what things must be solved first? Tell me?
- *R-4* : *Find 4 numbers and 3 operators.*
- *P* : How did you think of this method, where did you get the reference to solve the problem like this?
- *R-4* : *Try to calculate 2 numbers first and subtract or add or divide or multiply, then calculate again and find the answer.*
- *P* : Can you find a different way other than the one you wrote down?
- *R-4* : Yes, by reversing the numbers

3. Originality



Figure 9. Work Result R-1

Figure 9 shows R-1 is answer using logic, assuming that the number added and subtracted by 3 is 7/3. This shows that R-1 is able to fulfill the originality indicator, because he is able to use a unique way based on his logic. Strengthened by the results of the interview below.

- *P* : *Have you ever done a problem like this before?*
- *R-1* : Yes.
- *P* : Can you tell me how you solved problem number 3!
- *R-1* : 1 is not considered so the number plus and minus 3 is 7/3, because 10-3 is 7 and 4+3 is 7.
- *P* : Can you find a different way other than the one you wrote down?
- *R-1* : *No*.
- *P* : Do you think the way you solved the problem is "new" or haven't thought of it before?
- *R-1* : Yes, I have never seen it before.

3.)
$$\frac{4}{3} + 1 = \frac{7}{3}$$
 $\frac{4}{3} + \frac{1}{1} = \frac{4+3}{3}$
 $\frac{10}{3} - 1 = \frac{7}{3}$ $\frac{4}{3} + \frac{1}{3} = \frac{7+3}{3}$

Figure 10. Work Result R-2

Figure 10 shows that R-2 can understand the information contained in the problem. Based on the answers written, ZA was able to fulfill the originality aspect, because in the solution process R-2 used the combination of whole numbers and fractions. This is corroborated by the interview results below.

P : Can you tell me how you solved problem number three?

- *R-2* : Yes, by using 4/3 +1 and 10/3 -1 and producing the result we are looking for, and in the addition of fractions the thing that needs to be considered is how numbers other than integers turn into integers.
- *P* : Do you think the way you solved the problem is "new" or haven't thought of it before?
- *R-2* : *No*.
- *P* : Is there another way besides this?
- *R-2* : *No*.

3. $\frac{4}{3}$ + $\frac{1}{1}$ = $\frac{4+3}{3}$ = 7

Figure 11. Work Result R-3

In Figure 10, it shows that R-3 is unable to fulfill the originality indicator, as evidenced by the answer with a single way of using money and not according to the instructions and information contained in the problem. The two information should be proven as a whole, this can be supported by the results of the interview below.

- *P* : Can you tell me how you solved problem number 3!
- *R-3* : *Reading first, I started to try by flipping it over and then I found it.*
- *P* : Can you find a different way other than the one you wrote down?
- *R-3* : No, I didn't.
- *P* : Do you think that the way you solved the problem is "new" or you haven't thought of it before?
- *R-3* : *No*.

$$\begin{array}{c} 3 \\ 3 \\ \frac{16}{3} + 1 \\ \frac{1}{3} + 1 \\ \frac{1}{3} + \frac{1}{1} \\ \frac{1}{3} + \frac{1}{1} \\ \frac{1}{3} + \frac{1}{3} \\ \frac{1}{3} \\ \frac{16}{3} \\ \frac{1}{3} \\ \frac{16}{3} \\ \frac{1}{3} \\$$

Figure 12. Work Result R-4

In Figure 12, it shows that subject R-4 can solve in a gradual way according to the information contained in the problem. In this answer R-4 also stated that this understanding and method was new, because the problem presented encouraged R-4 to develop his understanding obtained previously. This indicates that R-4 can fulfill the Originality indicator, namely being able to combine whole numbers into fractions and solving in a way that has never been encountered by the subject. Reinforced by the interview results below.

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Р	: Can you tell me how you solved problem number 3?
R-4	: Read it first to understand it, and found out that you just need to fix the
	numbers to do it. Then I added the denominator.
Р	: Do you think the way you solved the problem is "new" or haven't thought of it before?
R-4	: Yes, because the problem was simple before, not this complicated.
Ρ	: Is there any other way besides this?
R-4	: No.

4. Elaboration

() Jana remah andi 40 severet qdaron 10 4 » giuq tama andi beransuri. Ium adarah z mnt maaa membalahum waxi u za mnt jawabannya adarah jan 66-40



Figure 13 shows that subject R-1 was able to convey the information contained in the problem. In his solution, R-1 was able to develop the information obtained and state the answer in detail. This shows that R-1 fulfills the elaboration indicator. Strengthened by the results of the interview below.

P : Can you mention the information presented in question number four?

R-1 : Yes, andi's distance to school is 10 kilometers with 1 kilo 2 minutes.

P : How do you solve problem number four? Explain in detail!

- *R-1* : Multiplying 2 minutes by the distance of 10 km, then used to subtract the hour that has been set and then subtract 07.00 with the result of minutes in 10 kilometers.
- *P* : Is there another answer?

R-1 : No

4.) lo km x2 menit = 20 menit maksimal Andi berangkat adalah ob.00

Figure 14. Work Result R-2

Figure 14 shows an answer of subject R-2 on the elaboration indicator. Based on the answer, R-2 is able to develop the information obtained in the problem, but in the solution R-2 has not explained in detail how 06.00 was obtained, therefore ZA has not fulfilled the elaboration aspect. This is corroborated by the interview results below.

P : Can you mention the information presented in question number four? If so, please mention it!

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- *R-2* : Yes, a person who wants to go to school, with a distance of 10 meters, every 1 kg 2 minutes, and what is asked is what time the person should leave for school and not be late.
- *P* : How do you solve problem number four? Explain in detail!
- *R-2* : 10 kilometers defines the distance from school to home, and 2 minutes is 1 kilo traveled, thus 10 kilometers x 2 minutes.
- *P* : So what is the conclusion of the problem?
- *R-2* : 06.80 Andi left.

10 × 2 = 20 menit Ja. disekolah and: musuk Jam 07.00 Jadi maksimal andi berangkat sekobah agar tetap tiday terlambat adalah pukul 06.201 Kavena per jalanan ke Kekolah adalay 20 menit.

Figure 15. Work Result R-3

Figure 15, it shows that subject R-3 can state the information contained in the problem, although the wrong answer the subject can provide an overview by developing how Andi is not late for school. This shows that the elaboration indicator can be fulfilled, because R-3 can develop information and can mention the completion stage in detail. Strengthened by the results of the interview below.

- *P* : Can you mention the information presented in question number four?
- *R-3* : Yes, and i's school starts at 7, the distance is 10 km and 1km = 2 minutes, and what is asked is what time and i goes to school.
- *P* : How do you solve problem number four? Explain in detail!
- *R-3* : It is known that 1km = 2 minutes, then 2 minutes multiplied by 10 km finds 20 minutes and the result is multiplied by what time with approximately the result not until 7 o'clock. In this case, if Andi does not want to be late for school, then Andi must leave at 06.40, because in 1 kilometer Andi's distance to school is 2 minutes, so if Andi's distance to school is 10 minutes, then the time taken by Andi is 40 minutes.
- *P* : Based on your answer, are there any mistakes in writing the answer?
- *R-3* : Yes, because I am not careful

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() Serolah Masur = 07.00 Jarak rumah Andi = 10 km lama Andi 1km = 2 menit = 10 km + 2 menil Menit) an 06.90 jita ingin Ferlambat

Figure 16. Work Result R-4

Figure 16, it shows that subject R-4 can fulfill the Elaboration indicator. Proven by the answer of R-4 which is packaged in detail based on the information obtained, so that in the answer the information can be developed and passed on in detail and produce the right answer, even though the results present two possible answers, namely the time if you arrive at school before 07.00 and the time if you arrive at school exactly at 07.00. This is corroborated by the results of the interview below.

- *P* : Can you mention the information presented in question number four? If so, please mention it!
- *R*-4 : Yes, Entering school at 7, distance 10 km and 1km = 2 minutes.
- *P* : Okay, then how do you solve problem number four? Explain in detail!
- *R-4* : From the known, 10 x 2 minutes = 20 minutes, andi's departure time 20 minutes (as a result of Andi's tight departure), trying to calculate with other times so that it is not tight.
- *P* : So, what is the conclusion of the problem?
- *R-4* : Andi leaves at 06.20 if she doesn't want to be late. If he wants to be on time at 07.00 then Andi must leave at 06.40.

Based on the research results which show that gender plays a role as a factor that differentiates mathematical creative thinking ability in students of MTs Negeri 7 Malang, there are several aspects that need to be considered, namely fluency, flexibility, originality, and elaboration. **Fluency**, Female students provided more detailed answers, showcasing higher fluency in creative thinking, as supported by Dilla *et al* (2018), Adiastuty *et al* (2020), and Muhammad & Nikmah (2021). In contrast, male students often gave concise and direct responses, reflecting logical thinking but with less elaboration. This difference highlights the strength of detailed reasoning in females versus efficient, straightforward approaches in males. **Flexibility**, Female students excelled in adopting various problem-solving alternatives, demonstrating greater openness and adaptability. Studies, such as Wen-jing *et al* (2018), found consistent application of diverse approaches by female students. While male students also used varied methods, their approaches were less consistent, indicating a gap in adaptability compared to female students. Both genders, however, showed the ability to apply creative solutions when required. **Originality**, Male students often used personal, logic-based approaches to

generate unique solutions. Inuusah *et al* (2019) observed that males frequently applied unconventional methods, yielding creative outcomes. Female students also exhibited originality, with studies by Bicer *et al* (2023) and Baehaki *et al* (2022) highlighting their innovative thinking. Despite differences in approach, both genders demonstrated comparable originality, with males leaning toward logical uniqueness and females toward innovative diversity. **Elaboration**, Female students provided more systematic and detailed responses, reflecting advanced creative thinking, as noted by Yasa *et al* (2021) Their elaborative abilities showed greater accuracy and depth. Conversely, male students prioritized efficiency, offering concise answers with less detail. While both approaches have merits, females displayed stronger elaborative skills in problem-solving tasks.

Thus, the differences in mathematical creative thinking can help educators to always innovate in designing a more effective learning, so that educators can better understand to design learning that can facilitate student learning based on gender and habits.

CONCLUSIONS

Based on the description above, it can be concluded that gender affects the mathematical creative thinking ability of students at MTs Negeri 7 Malang. Female students show superiority in the aspects of fluency, flexibility, and elaboration, while male students are more dominant in the aspect of originality. This finding is expected to be a reference for educators in designing more effective and innovative learning strategies by considering the unique characteristics of each gender. One step that can be taken is the implementation of differentiated learning through context-based assignments and heterogeneous group work to encourage the sharing of creative strategies. Future research is recommended to explore other factors that may affect mathematical creative thinking skills, such as cultural background, teaching methods, and learning environment, to gain a more comprehensive and in-depth understanding.

REFERENCES

- Adiastuty, N., Waluya, S. B., Rochmad, & Aminah, N. (2020). Neuroscience Study: Gender and Mathematical Creative Thinking Skills in Vocational High School Students. *Journal of Physics: Conference Series*, 1613(1). https://doi.org/10.1088/1742-6596/1613/1/012056
- Baehaki, A., Adiastuty, N., & Nurhayati, N. (2022). The Analysis of the Mathematical Creative Thinking Process in Terms of Gender Based on Wallas' Theory. https://doi.org/10.4108/eai.2-12-2021.2320280
- Bicer, A., Bicer, A., Capraro, M., & Lee, Y. (2023). Mathematical Connection is at the Heart of Mathematical Creativity. *Creativity*, 10(1–2), 17–40. https://doi.org/10.2478/ctra-2023-0002
- Dewi, A. K. (2024). [Ber]Pikir Kreatif Penerbit Cv. Eureka Media Aksara.
- Dilla, S. C., Hidayat, W., & Rohaeti, E. E. (2018). Faktor Gender dan Resiliensi dalam Pencapaian Kemampuan Berpikir Kreatif Matematis Siswa SMA. Journal of Medives : Journal of Mathematics Education IKIP Veteran Semarang, 2(1),

129. https://doi.org/https://doi.org/10.31331/medives.v2i1.553

- Eka Putri Widyawati, Ainul Luthfiya Arifin, Nurul Farhah, Alfiya Nurul, & C., & Amalina. (2024). Perspektif Gender dalam Pembelajaran Matematika. *Prosiding Diskusi Panel Nasional Pendidikan Matematika Universitas Indraprasta PGRI Jakarta.*, *12*(1), 347–352. https://doi.org/10.24014/marwah.v12i1.511
- Fadli, M. R. (2021). Memahami Desain Metode Penelitian Kualitatif. *Humanika, Kajian Ilmiah Mata Kuliah Umum*, 21(1), 33–54. https://doi.org/10.21831/hum.v21i1.
- Fauziyah, I. N. L., Usodo, B., & Ch., H. E. (2013). Proses Berpikir Kreatif Siswa Kelas X dalam Memecahkan Masalah Geometri Berdasarkan Tahapan Wallas Ditinjau Dari Adversity Quotient (QA) Siswa. Jurnal Pendidikan Matematika, 1(c), 1–17.
- He, K. (2017). A Theory of Creative Thinking: Construction and Verification of the Dual ... Kekang He Google Buku.
- Inuusah, M., Regine, K., Jonathan, M. K., Ebenezer, A., & Richard, M. (2019). Relationship between Creative Thinking and Students Academic Performance in English Language and Mathematics: The Moderating Role of Gender. *Journal of Education, Society and Behavioural Science*, 31(4), 1–10. https://doi.org/10.9734/jesbs/2019/v31i430159
- Jayanti, I., Arifin, N., & Nur, D. R. (2020). Analisis Faktor Internal dan Eksternal Kesulitan Belajar Matematika di Sekolah dasar. Sistema: Jurnal Pendidikan, 1(1), 2. https://jurnal.fkip-uwgm.ac.id/index.php/sjp
- Lexy, J. M. (2010). Metodologi Penelitian Kualitatif. PT Remaja Rosdakarya.
- Muhammad, M., & Nikmah, E. (2021). Description of Students' Mathematical Creative Thinking Skills Reviewed From Gender Differences. https://doi.org/10.4108/eai.17-7-2021.2312407
- Purwanto, W. R., Sukestiyarno, Y. L., & Junaedi, I. (2019). Proses Berpikir Siswa dalam Memecahkan Masalah Matematika Ditinjau dari Perspektif Gender. *Prosiding Seminar Nasional Pascasarjana UNNES*, 894–900. https://proceeding.unnes.ac.id/snpasca/article/view/390
- Retno, S. (2024). Gender Dan Permasalahanya. Buletin Psikologi, 3(1).
- Rusandi, & Muhammad Rusli. (2021). Merancang Penelitian Kualitatif Dasar/Deskriptif dan Studi Kasus. *Al-Ubudiyah: Jurnal Pendidikan dan Studi Islam*, 2(1), 3. https://doi.org/10.55623/au.v2i1.18
- Saputra, I. R., & Santoso, G. (2023). Ekspresi Diri Mengembangkan Potensi Kreatif, Pribadi, dan Akademik Mahasiswa UMJ di Abad 21. 02(06), 2023.
- Siregar, T., Amir, A., Hilda, L., & Nasution, M. (2024). Pengembangan Model Asesmen As Learning untuk Meningkatkan Keterampilan Berpikir Kreatif Berbasis Education for Sustainable Development pada Mahasiswa Tadris Matematika di UIN Syahada Padangsidimpuan. June.
- Siti Azisah, Abdillah Mustari, Himayah, A. M. (2018). Konstektualisasi Gender, Islam dan Budaya. *Buletin Al-Turas*, 16(1), 200–216.

https://doi.org/10.15408/bat.v16i1.4289

- Ummah, M. S. (2019). Kemampuan Berpikir Kreatif Matematis. Sustainability (Switzerland), 11(1), 47–67.
- http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciur beco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_ SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI
- Wardatun, L., Sukardi, S., & Nursaptini, N. (2024). Pengaruh Model Open Ended Problems Berbantuan Media Big Book Terhadap Kemampuan Berpikir Kreatif Siswa. Jurnal Ilmiah Profesi Pendidikan, 9(1), 113–118. https://doi.org/10.29303/jipp.v9i1.1811
- Wen-jing, Z., Ren, P., & Deng, L. (2018). Gender differences in the creativity–academic achievement relationship: a study from china. *Journal of Creative Behavior*, 54(3), 725–732. https://doi.org/https://doi.org/10.1002/jocb.387
- Yanti, Y. A. A., & Qomarul Sholihah. (2024). Strategi Pengelolaan Kelas Dalam Meningkatkan Motivasi Belajar Peserta Didik Pada Mata Pelajaran Bahasa Arab. TA'DIB: Jurnal Pendidikan Agama Islam, 2(2), 222–235. https://doi.org/10.69768/jt.v2i2.56
- Yasa, A. D., Chrisyarani, D. D., Wadu, L. B., Wibawa, A. P., & Kuswandi, D. (2021). Math Creativity Survey For Class 4 Elementary School. *Jurnal Ilmiah Sekolah Dasar*, 5(4), 658–664. https://doi.org/10.23887/jisd.v5i4.39479
- Zubaidah, S. (2021). Keterampilan Abad ke-21. Jurnal Pendidikan Biologi, June, 1–25.