ISSN 2715-7458
E-ISSN 2715-7466

Journal of Mathematical Pedagogy
Volume 6, No. 1, December 2024, pp. 1-13

Exploring Students' Creative Thinking Process in Solving Triangle Problems Assisted by *GeoGebra*

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Abstract

The study aims to describe student's creative thinking process in solving triangle problems using *GeoGebra*. This qualitative approach involved six students selected from 28 students in grade 8 based on the case categories of student's abilities namely high mathematical abilities (HMA), medium mathematical abilities (MMA), and low mathematical abilities (LMA). Data collection techniques were conducted through mathematical ability tests (MAT) to determine research subjects, creative thinking tests assisted by *GeoGebra* to determine students' creative thinking processes, and interviews. The data analysis technique uses indicators of creative thinking stages according to Siswono, and data reduction from interviews to explore student's creative thinking processes. The research results show that student's creative thinking processes at the stages of synthesizing ideas, generating ideas, planning the implementation of ideas, and implementing ideas have different processes at each ability level. At the stage of synthesizing ideas, all students synthesize their ideas by combining the knowledge they have, both from everyday life and during classroom learning. All students were able to mention the information contained in the questions. LMA had difficulty relating the information in the questions to daily life and learning experiences in class, but HMA and MMA were able to relate it smoothly. At the idea-building stage, HMA and MMA can come up with two ideas for solutions using *GeoGebra*, while LMA can only come up with one idea. At the stage of planning to implement the idea, HMA and MMA had other ideas for solving the problem, but LMA only had one idea for solving it. At the stage of applying ideas, HMA and MMA can show two different answer ideas, while LMA can only show one answer idea. HMA was able to solve questions using *GeoGebra* smoothly, but MMA and LMA were less fluent, all subjects checked their answers again, HMA and MMA were confident in their answers, but LMA was less confident in their answers.

Keywords: creative thinking process, triangle problems, geogebra, mathematical abilities.

Abstrak

Penelitian ini bertujuan untuk mengetahui proses berpikir kreatif siswa SMP dalam menyelesaikan masalah segitiga berbantuan *GeoGebra*. Penelitian kualitatif ini menggunakan enam siswa yang dipilih dari 28 siswa pada kelas 8 berdasarkan kasus kategori kemampuan siswa, yaitu kemampuan matematika tinggi (ST), kemampuan matematika sedang (SS), dan kemampuan matematika rendah (SR). Teknik pengambilan data dilakukan melalui tes kemampuan matematika (TKM) untuk menentukan subjek penelitian, tes berpikir kreatif berbantuan *GeoGebra* untuk mengetahui proses berpikir kreatif siswa, dan wawancara. Teknik analisis data menggunakan indikator tahapan berpikir kreatif menurut Siswono, dan reduksi data hasil wawancara untuk menggali proses berpikir kreatif siswa. Hasil penelitian menunjukkan bahwa proses berpikir kreatif siswa pada tahapan mensintesis ide, membangun ide, merencanakan penerapan ide, dan menerapkan ide memiliki proses yang berbeda pada tiap tingkat kemampuannya. Pada tahap mensintesis ide, seluruh siswa mensintesis idenya dengan memadukan pengetahuan yang dimiliki, yaitu dari kehidupan sehari-hari maupun pengalaman belajar di kelas, Semua siswa dapat menyebutkan informasi yang terdapat pada masalah, SR mengalami kesulitan dalam mengaitkan informasi pada masalah dengan kehidupan sehari-hari dan pengalaman belajar di kelas, namun ST dan SS dapat mengaitkannya dengan lancar. Pada tahap membangun ide, ST dan SS dapat memunculkan dua ide penyelesaian denga/n menggunakan *GeoGebra*, sementara itu SR hanya dapat memunculkan satu ide. Pada tahap merencanakan penerapan ide, ST dan SS memiliki ide lain dalam menyelesaikan masalah, SR hanya memiliki satu ide penyelesaian. Pada tahap menerapkan ide, ST dan SS dapat menunjukkan dua ide jawaban yang berbeda, sementara itu SR hanya dapat menunjukkan satu ide jawaban. ST dapat menyelesaikan masalah menggunakan *GeoGebra* dengan lancar, namun SS dan SR kurang lancar, seluruh subjek memeriksa kembali jawabannya, ST dan SS yakin dengan jawabannya, namun SR kurang yakin terhadap jawabannya.

Kata kunci: proses berpikir kreatif, masalah segitiga, geogebra, kemampuan matematika

How to Cite: Kartikawati, W. & Siswono, T.Y.E. (2024). Exploring Students' Creative Thinking Process in Solving Triangle Problems Assisted by GeoGebra. *Journal of Mathematical Pedagogy*, *6* (1), 1-13.

Introduction

Creative thinking is closely related to creativity because creativity is the result of a creative thinking process carried out by individuals (Mednick, 1962). Creativity is the ability to think about something in a new and unusual way and think of unique solutions to a problem (Santrock, 2010). Creativity is one part of the 6Cs (Communication, Collaboration, Critical Thinking, Creativity, Character, and Citizenship) which is an important skill in facing challenges in the 21st century (Anggraeni et.al., 2022). Likewise, Robinson (Newton & Newton, 2014) stated that creativity is the crucial 21st-century skill needed to solve pressing contemporary problems, which means creativity is important because it can provide solutions to complex problems. In addition, with increasing mobility and access to digital information, science will develop faster than before. For this reason, creativity is very necessary to help us remain flexible and face opportunities and challenges in a complex and rapidly changing world (Ritter & Mostert, 2017; Valverde et.al., 2020).

Student's creative thinking abilities are also reflected in the results of research conducted by Leasa et.al. (2021) which states that the majority of students at primary and secondary education levels in Indonesia cannot produce original and innovative creative ideas. Likewise, Supriaman (2023) stated that creative thinking abilities in Indonesia are still relatively low, so efforts are needed to improve student's creative thinking abilities. So, efforts to improve students' creative thinking ability is by training students to work on problems that trigger their creative thinking.

The creative thinking process is a series of mental activities for a person to develop new ideas to solve a problem, Next, the creative thinking process according to Siswono (2008) is the synthesis of ideas, building ideas, planning implementation, and implementation of ideas. Synthesizing ideas means interweaving or combining the ideas you have, whether they come from classroom learning or everyday experience. Building ideas means coming up with ideas related to the problem given. Planning the implementation of ideas means selecting certain ideas to use in solving a given problem. Applying ideas means implementing ideas that are planned to solve a given problem.

Aldi and Ismail (2023) states that each student has different mathematical abilities, and this difference is one of the characteristics of each student that other students do not have. Furthermore, one of the factors that can influence student's creative thinking processes in learning mathematics is their mathematical abilities (Bicer et.al., 2022). Based on test scores, mathematics ability can be divided into high, medium, and low mathematics ability. Huriyah (2017) and Siswono (2008) show that there are differences in the creative thinking processes of students who have high, medium, and low mathematical abilities at the stages of planning to implement ideas and implementing ideas. This means that student's creative thinking processes in solving mathematical problems are influenced by mathematical abilities. So, if the creative thinking processes of students who have high, medium, and low mathematical abilities can be described, it is hoped that this can be useful for optimizing mathematics learning.

One strategy to improve problem solving skills and understanding of learning methods is by using technology (Kale & Akcaoglu, 2020). Therefore, by using technology such as *GeoGebra* it is hoped

that it can help teachers in explaining material to students (Aswan et.al., 2024). *GeoGebra* is software-free and interactive math open-source for geometry, algebra, statistics, calculus, and three-dimensional mathematics (Wahyuni et.al., 2022). One of the advantages of *GeoGebra* software, including having complete facilities and being freely available because of their nature of open sources, and can be accessed for free at www.*GeoGebra*.org (Hadi et.al., 2018). Furthermore, (Anjarsari et.al., 2022) also said one of the purposes of using *GeoGebra* software in mathematics learning, namely to expand students' creative thinking and the learning evaluation process, use information technology to stimulate students' imagination during learning, and as a tool in delivering relevant mathematics material in everyday life.

In research by (Selvy et.al., 2020) which aims to determine students' mathematical creative thinking abilities using *GeoGebra*, the results of the study showed that there was an increase in student's mathematical creative thinking abilities, and student motivation is higher than those taught without the help of technology. This is in line with research by (Kllogjeri A & Kllogjeri P, 2015) which states that the use of *GeoGebra* software in the process of learning mathematics, knowledge, and skills can be increased to a much greater extent than traditional methods. Likewise, research by (Uwurukundo et.al., 2020) regarding usage literature *GeoGebra* shows that 80% of the research shows that *GeoGebra was* effective in teaching and learning mathematics because it contributes to increasing students' understanding of mathematical concepts and interest in learning mathematics. So, using *GeoGebra* is highly recommended to improve mathematics learning because it can create fun and interesting mathematics learning (Uwurukundo et.al., 2020).

Students' creative thinking process can be known by giving them mathematical problems (Sitorus & Masrayati, 2016). One of the materials that can be used to find out students' creative thinking process is triangle material. Triangles are one of the simplest plane shapes but have wide applications in various fields of daily life and science (Indriana & Maryati, 2021). In geometry, triangles are the foundation for understanding more complex concepts such as trigonometry, side and angle ratios, and various other geometric properties and theorems. In addition, triangles are also the basis for learning other geometric concepts such as polygons, circles, and solid shapes (Sumiati & Agustini, 2020). Therefore, a strong understanding of triangles and other geometric concepts is an important foundation in building mathematical creative thinking skills in students at elementary and secondary education levels. So, to solve a triangle problem, students need a creative thinking process, not necessarily by the teacher's instructions, what is important in solving triangle problems is that students can find many solutions and answers that are relevant to the solution, can find many alternatives or different ways to solve problems with other strategies. And one way to train students' abilities in triangle material is to train students' creative thinking processes. Therefore, in this study, researchers used triangle material to determine students' creative thinking processes.

Based on the description above, this research is aimed at describing the creative thinking process of junior high school students in solving assisted triangle problems by *GeoGebra*, which is viewed from

the student's mathematical abilities. The study in this research focuses more on the student process in the form of stages of creative thinking according to Siswono (Siswono, 2008).

Method

This type of research is qualitative case study research. A case study is a research that seeks to gain an in-depth understanding (in-depth) a situation and give meaning to the things involved, Merriam (Siswono, 2019). This is because qualitative research is the aim of this research, namely to analyze the creative thinking process of class VIII SMP students in solving triangle problems assisted by *GeoGebra*. The main data in this research were obtained from the results of mathematics ability tests (MAT), creative thinking tests, and interview results. Interviews are conducted after students complete creative thinking ability test questions. This interview aims to explore more in-depth information regarding students' creative thinking processes in solving assisted triangle problems *GeoGebra*.

The main instrument in this research is the researcher himself. In qualitative research, the researcher acts as the main instrument that carries out planning, data collection, data analysis, and research pioneers. As the main instrument, researchers must be objective in analyzing research data which includes mathematical ability test data, creative thinking tests, and interview data. Researchers must act neutrally regarding the subject's answers when the subject completes a math ability test or creative thinking test. This is important so that the researcher does not influence the subject's creative thinking process toward the answer the researcher wants.

To obtain research data, supporting instruments are needed, namely a mathematics ability test (MAT), a creative thinking test, and an interview guide. The Mathematics Ability Test (MAT) is an instrument used to determine the level of a student's mathematical abilities. The scores obtained are used as the basis for selecting research subjects. The questions used in MAT are first consulted with the supervisor. The Mathematics Ability Test (MAT) in this study used triangle material. Creative thinking test questions are used to determine the creative thinking process of junior high school students in solving assisted triangle problems *GeoGebra* based on their mathematical abilities. The assignment consists of one descriptive question prepared by the researcher based on the indicators that have been created in this research. The questions used in this test use triangle material. The interview guide aims to help researchers reveal more deeply about the creative thinking process of junior high school students in solving assisted triangle problems *GeoGebra*. Interview guidelines are prepared based on an indicator creative thinking process. If the subject has difficulty answering each question asked, a simpler question is given so that it can help the subject to answer without changing the meaning of the problem. This can make it easier for researchers to understand the creative thinking process in solving given mathematical problems.

This research used two subjects at each level of mathematical ability. So the method of drawing conclusions used in this research is that when the data produced by both subjects is the same, then that data is used in the conclusion. Meanwhile, if the data produced from the two subjects is different, it is

taken based on the tendencies of the two research subjects.

The subjects in this research were class VIII junior high school students. The class that is used as the research subject is a class in which the students have already been taught *GeoGebra* during learning. In this study, one class was chosen to be given MAT to make it easier for researchers to group students who have high mathematical abilities ($80 \leq$ test scores ≤ 100), medium math abilities ($60 \leq$ test scores < 80), and low math ability (test scores < 60) (Ratumanan & Laurens, 2006). Two students were selected from each group to serve as research subjects for giving creative thinking test questions. The subjects selected in each group are the students who have the highest scores in the group's score range.

Analysis of interview data was carried out in six stages, namely data reduction, data presentation, and conclusion. At the data reduction stage, the activities carried out by the researcher are reducing unnecessary information and organizing the interview results that have been obtained. At the data presentation stage, the researcher presents the data that has been obtained from the data reduction stage. The data is presented in the form of narrative text regarding indicators and stages of students' creative thinking processes, and conclusions are drawn regarding student's creative thinking processes. The drawing conclusion stage is based on the results of data analysis which has been clearly described based on the stages of creative thinking. Conclusions can be drawn from the data regarding students' creative thinking processes in solving assisted triangle problems *GeoGebra* based on the stages of synthesizing ideas, building ideas, planning idea implementation, and implementing ideas. Furthermore, to maintain the validity of research data which refers to the truth of the findings according to the views of the participants and within the scientific discipline, it is necessary to carry out validation, one of which is source triangulation. Triangulation is defined as checking data from various data sources in various ways, methods, and at various times (Siswono, 2019). This triangulation aims to re-check the validity of the research data so that the results of this research data are appropriate.

Indicators of students' creative thinking in solving triangle problems with the help of *GeoGebra* can be seen in Table 1 below.

Table 1. Indicators of student's creative thinking

The Stages of Student's Creative Thinking	Indicators
Synthesize Ideas	Combining ideas or thoughts that come from both classroom learning and daily experiences
Building Ideas	Bring up ideas related to the problem or problem given from various points of view.
Plan Implementation of Ideas	Choosing a particular idea to use in solving the problem or problem that is given or that you want to solve.
Implementing Ideas	Applying several ideas to produce several alternative solutions.

Result and Discussion

The research subjects used in this study were students in one of the junior high schools in Sidoarjo Regency, class VIII, 2023/2024 academic year. 28 students took the mathematics ability test (MAT). In this research, six subjects will be analyzed, namely two students each who have high,

medium, and low mathematical abilities. The determination of this subject was based on Ratumanan & Laurens (Ratumanan & Laurens, 2006). Based on these criteria, the research subject data used is as follows.

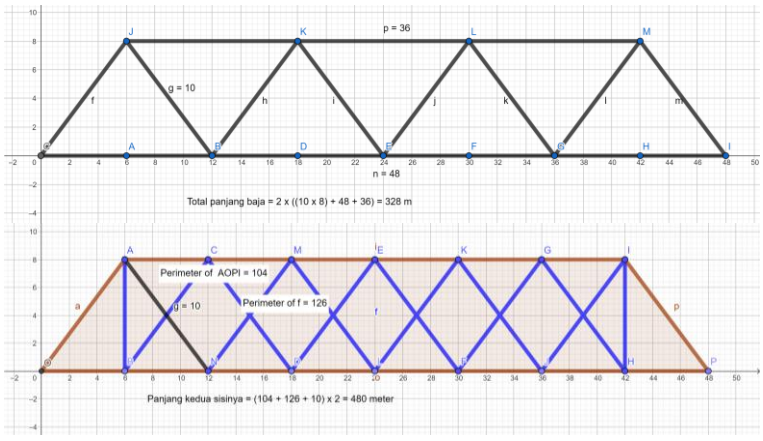
Table 2. Research Subject Data

Number	Mathematics Ability Category	Student Name Initials	MAT Score
1.	High	NSH	88
		NSR	84
2.	Medium	DAH	76
		LAV	76
3.	Low	ARC	52
		RAA	52

Creative Thinking Test questions were given to six selected research subjects. After the six subjects worked on assisted questions *GeoGebra*, each subject was interviewed to be able to dig deeper into students' creative thinking processes in solving assisted triangle problems *GeoGebra*. Interviews were conducted based on interview guidelines. The results of solving creative thinking test questions and interviews are used to explore information and student's creative thinking processes in solving questions, which are not written in the answers. The information revealed includes the subject's process of synthesizing ideas, building ideas, planning the implementation of ideas, and implementing ideas.

The questions from the creative thinking test given to the subjects in this study were that the subjects were given questions about truss bridges, then the subjects were asked to design the bridge and solve it using Geogabra, with different designs and alternative solutions in determining the minimum length of steel required.

The following is the solution to the HMA subject in solving assisted triangle problems *GeoGebra*.



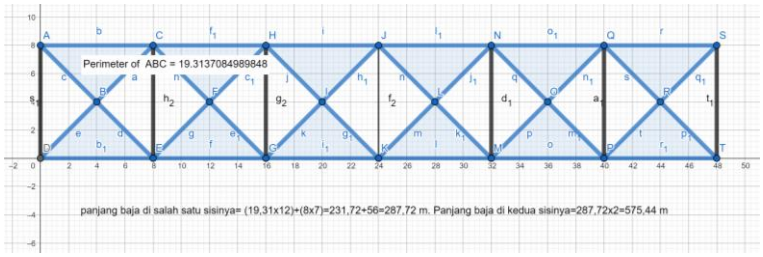


Figure 1. HMA completion using *GeoGebra*

HMA1 interview result		
R	:	Do you understand the meaning of this question?
HMA1	:	Yes, I understand
R	:	What is known about this problem?
HMA1	:	An architect will create a steel truss bridge. Provided that the length of the bridge is 48 meters and the height is 8 meters. The framework is in the shape of at least 5 triangles. Then we are told to make the framework using *GeoGebra*
R	:	What is the question asking about?
HMA1	:	About finding the length of the steel used to make the bridge on both sides is the same (points to the picture of the bridge frame), and was told to draw another design differently and find the length too.
R	:	In everyday life, what is this problem related to?
HMA1	:	Bridge design and architect
R	:	Have you ever had or done a problem like that before?
HMA1	:	Never
R	:	Is there a connection between the material and the material you have studied?
HMA1	:	In mathematics, it's like the length of a line, the distance between two points, and Pythagoras.

The results of solving the questions show that the subject can meet the indicators of creative thinking ability, namely fluency, flexibility, and novelty. At the stage of synthesizing ideas, the subject explains the information and meaning of the questions given, both what is known and what is being asked, fluently. This is in line with research by (Wulantina & Kusmayadi, 2015) which states that subjects who have high mathematical abilities carefully explore the information known in the problem, and then also identify the problem being asked well, choosing the information correctly. Subjects also relate the questions given to previously studied material and learning experiences in class. Then, the subject also related the questions given to everyday life and related the questions to previous experiences when using *GeoGebra*. At the idea-building stage, the subject comes up with an idea for a solution based on his thoughts on solving the problem so that it is appropriate provisions stated in the question. The subject considers the number of triangles needed and adjusts the size of the triangles to match the specified size. The subject uses the formula that has been learned, using the concept of division. The subject relates the question to other material. Then the subject combines the ideas they have related to everyday life and the mathematical material that has been studied. Subjects can demonstrate two solution ideas using *GeoGebra*. At the stage of planning to implement the idea, the subject came up with the idea smoothly and productively, even though at first he experienced difficulties, he was able to show the answer correctly. The subject was also fluent when explaining the plan used to solve the problem given. At the stage of implementing the idea, the subject explains the steps for the solution he chose smoothly.

Subjects can also operate *GeoGebra* smoothly in solving questions. The subject is sure of the answer and checks the answer again. Subjects can indicate two alternative answers with different solutions and have never been used before. The stages of the creative thinking process carried out by the subject (Siswono, 2008) creative thinking stages which include synthesizing ideas, building ideas, planning the implementation of ideas, and implementing ideas. This is in line with research conducted by (Huriyah, 2017) which states that subjects who have high mathematical abilities can show four stages of the creative thinking process. In Huriyah's (2017) research, subjects who had high mathematical abilities synthesized ideas based on learning experiences in class built ideas based on ease of method, planned the implementation of ideas based on logic and the results obtained, and implemented ideas using ideas that had been built previously. Furthermore, students who have high mathematical abilities are productive in generating their ideas, apart from that the subject can show more varied answers. To solve it, the subject uses the concept of the length of a line or the distance between points, namely by using tools 'segments' or 'polyline', And 'distance or length', then with the concept of the perimeter of a triangle using the tools ' polygon' and 'distance or length.

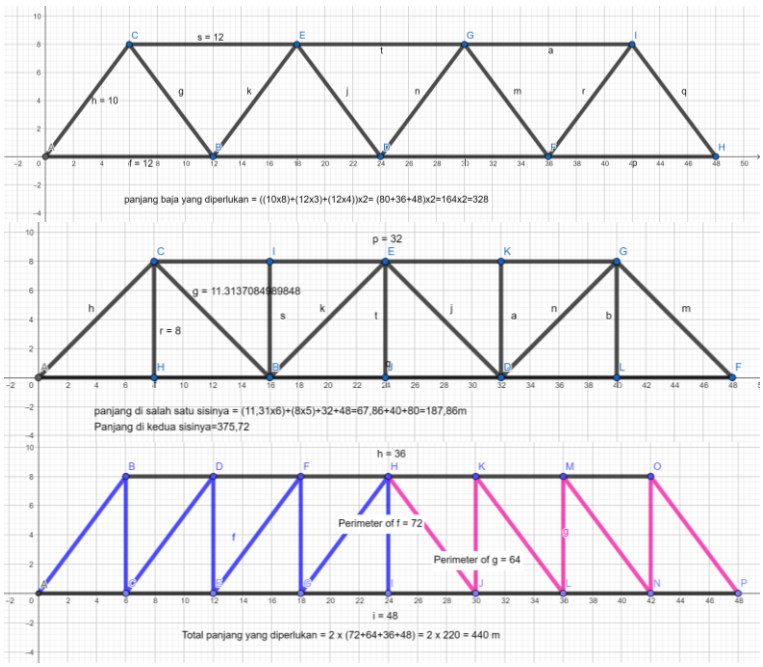


Figure 2. MMA completion using *GeoGebra*

The results of solving the questions show that the subject can meet the indicators of creative thinking ability, namely fluency, flexibility, and novelty. At the stage of synthesizing ideas, the subject explains the information and meaning of the question given, both what is known and what is being asked. Subjects also relate the questions given to previously studied material and learning experiences in class. Subjects had difficulty relating the questions given to everyday life. At the idea-building stage, the subject comes up with an idea for a solution based on the results of his experiments in making sketches. The subject then sketches the bridge from the previous idea. Then the subject combines the

ideas they have related to everyday life and the mathematical material that has been studied. Subjects can show two solution ideas using *GeoGebra*. At the stage of planning to implement the idea, the subject came up with the idea smoothly and productively, even though at first he experienced difficulties, he was able to show the answer correctly. The subject was also fluent when explaining the plan used to solve the problem given. At the stage of implementing the idea, the subject explains the steps for the solution he chose smoothly. Subjects can also operate *GeoGebra* smoothly in solving questions. The subject is sure of the answer and checks the answer again. The stages of the creative thinking process carried out by the subject by Siswono (2008) creative thinking stages which include synthesizing ideas, building ideas, planning the implementation of ideas, and implementing ideas. This is in line with research conducted by Huriyah (2017) and Aldi & Ismail (2023) which states that subjects who have medium mathematical abilities can show four stages of the creative thinking process. In Huriyah's research (2017), subjects who have mathematical abilities synthesize ideas based on their memory of the material they have studied in class, building ideas based on the suitability of the final result, planning the implementation of ideas using simpler methods, implementing ideas by implementing ideas that have been built and planned previously. Furthermore, according to Huriyah's (2017) research, subjects can provide two different ideas for solving a given problem.

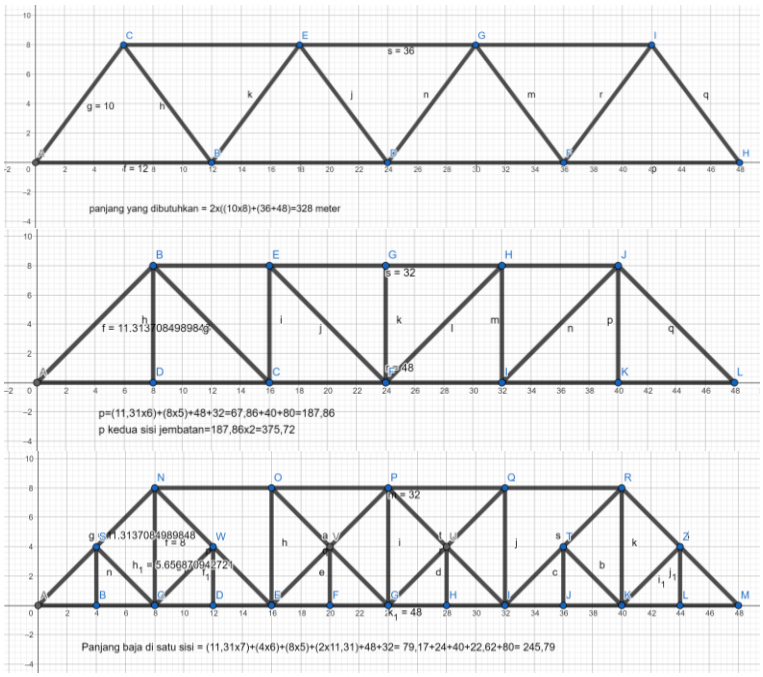


Figure 3. LMA completion using *GeoGebra*

The results of solving the questions show that the subject can meet the indicators of creative thinking ability, namely fluency. However, the subject does not meet the indicators of flexibility and novelty. At the stage of synthesizing ideas, the subject is less fluent in explaining the information and meaning of the questions given, both what is known and what is being asked, this is proven by the subject answering interview questions by pausing.. Subjects had difficulty relating the questions given to previously studied material and learning experiences in class. Subjects had difficulty relating the

questions given to everyday life. At the idea-building stage, the subject comes up with an idea for a solution based on the results of his experiments in making sketches. The subject then sketched the bridge from the experiment carried out. The subject can only show one solution using Geogebra, with two different bridge designs.. This is in line with research (Karim & Wijayanti, 2020) which states that subjects who have low mathematical abilities are less able to generate various ideas seen from the aspect of creative thinking that cannot emerge. At the stage of planning to implement the idea, the subject was not fluent in generating ideas, because the subject had difficulty in solving the problem. The subject was also less fluent when explaining the plan used to solve the problem given. At the stage of implementing the idea, the subject was less fluent in explaining the steps for the solution he chose. The subject experienced difficulty when operating *GeoGebra* in solving problems. The subject is not sure about the answer even though he has checked the answer again. The stages of the creative thinking process carried out by the subject by Siswono (2008) creative thinking stages which include synthesizing ideas, building ideas, planning the implementation of ideas, and implementing ideas. This is in line with research conducted by Huriyah (2017) and Aldi & Ismail (2023) which states that subjects who have low mathematical abilities can show four stages of the creative thinking process. The difference with the research results of Aldi & Ismail (2023), namely that in their research subjects who had low mathematical abilities were able to come up with two solution ideas. Meanwhile, in this study, the subject could only come up with one different solution idea. This is in line with research by Huriyah (2017) which states that subjects who have low mathematical abilities can only produce one alternative answer.

Based on the explanation above, in general, the creative thinking process of students in solving triangle problems has high, medium, and low mathematical abilities with the help of *GeoGebra* there is no very significant difference. The six students synthesize ideas by combining the ideas they have, both from classroom learning and daily experiences. For rather significant differences at the stages of synthesizing ideas and building ideas. From the explanation above, it can also be concluded that the higher the mathematical abilities that students have, the more ideas they can generate, this is in line with the subject's belief in the ideas being implemented.

A summary of the research results at each stage is presented in Table 2 below,

Table 2. Summary of the Research Results

Process Stages Creative Thinking	**Mathematics Ability Category**		
	High	**Medium**	**Low**
Synthesize Ideas	Students can mention information with precision and smoothness. The idea is based on experience study in the classroom and real-life	Students can mention information with precision and smoothness. That idea is based on experience, study in the classroom, and life daily	Students were not fluent in the mentioned information. The idea the based on information there is on the question

Building Ideas	Students can bring up ideas smoothly and can emerge two solution ideas using *GeoGebra*	Students had difficulty coming up with ideas but were able to come up with two ideas solutions using *GeoGebra*	Students had difficulty coming up with ideas, and could only come up with one solution idea using *GeoGebra*
Plan Implementation of Ideas	Students had other ideas but chose two ideas to use using *GeoGebra*	Students had no other ideas and chose two ideas to use using *GeoGebra*	Students do not have other ideas and choose one idea to use using *GeoGebra*
Implementing Ideas	Students produce two alternative answers using two different solution methods using *GeoGebra*	Students produce two alternative answers using two different solution ideas using *GeoGebra*	Students produce two alternative answers with the same solution method (one idea) using *GeoGebra*

Conclusion

Students who have high mathematical abilities synthesize ideas based on learning experiences in the classroom and everyday life. Then at the idea-building stage, students come up with ideas fluently and can come up with two ideas for solutions the triangle problem using *GeoGebra*. Subjects can plan the implementation of ideas well, even though students have other ideas, but students only choose two ideas that are used in the solution. At the stage of applying ideas, students produce two alternative answers with different solution methods which are new ideas that are rarely used by *GeoGebra*. At this stage, students are confident with their answers and check their answers again. Students can also meet indicators of fluency, flexibility, and novelty.

Students who have medium mathematical abilities synthesize ideas based on learning experiences in the classroom and everyday life. Then at the idea-building stage, students come up with ideas fluently, and students can come up with two ideas for solutions using *GeoGebra*. The subject plans the implementation of his idea by choosing two ideas that will be used in the solution, at this stage the student has no other ideas. Next, at the stage of applying ideas, students produce two alternative answers with different solution methods, which are new ideas that are rarely used by *GeoGebra*. Students are confident with their answers and check their answers again. Students can also meet indicators of fluency, flexibility, and novelty.

Students who have low mathematical abilities synthesize ideas based on the information contained in the questions. Then at the idea-building stage, students experience difficulty in building their ideas, this is shown by students only being able to come up with one solution idea using *GeoGebra*. Subjects plan to implement their ideas with one solution method because students only have one solution idea. Next, at the stage of applying ideas, students produce two alternative answers using the same method or methods used by *GeoGebra*. Students are not sure about the answer even though they have checked again. At this stage, students can only meet the indicators of creative thinking fluency

because they cannot demonstrate other methods of solving. Suggestions for further research are expected to explore more deeply the current technology with more varied materials.

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