International Journal of Instruction *October 2022 ● Vol.15, No.4*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 1011-1034

Article submission code: 20211115215309
Received: 15/11/2021 Revision: 08/06/2022
Accepted: 03/07/2022 OnlineFirst: 11/09/2022

Analysis of Mathematical Creative Thinking Skill: In Terms of Self Confidence

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Creative thinking is the ability to generate new ideas. The affective aspect related to creativity is self-confidence. This study aims to describe the characteristics of students' mathematical creative thinking skills based on self-confidence. Involved as many as 60 students who took the Differential Calculus course. The method used is descriptive qualitative. Data collection was obtained through questionnaires, tests, and interviews. Data analysis techniques include data reduction, data presentation, and concluding. Subjects were grouped into three self-confidence categories: low, moderate, and high, based on the questionnaire results. Using the purposive sampling technique, two people were taken as subjects in each category. The study results explain that students with low, moderate, and high self-confidence can write down several different answers and review them in detail. Students in the high self-confidence category can find relationships between concepts and answer questions in various or unique solving algorithms. Self-confidence is directly proportional to the achievement of creative thinking skills.

Keywords: **c**reative thinking ability, self-confidence, connection, thinking, mathematics

INTRODUCTION

To face the challenges of the 21st century requires skills in solving problems. One of the skills needed is creative thinking. In (Ariyana et al., 2018) explains four fundamental skills, namely creative thinking, critical thinking, communication, and collaboration.

Citation: Gunawan., Kartono., Wardono., & Kharisudin, I. (2022). Analysis of mathematical creative thinking skill: In terms of self confidence. *International Journal of Instruction*, *15*(4), 1011-1034.

The creative thinking framework in 21st-century education is to generate, develop, and apply new and authentic ideas both in groups and individually. Creative thinking sparks many different, lateral, and imaginative solutions.

The ability to think creatively and creativity are two interrelated things. The way to acquire creative thinking ability is called creativity. According to Chamberlin & Moon (2005), Idris & Nor (2010), Runco & Acar (2012), and Simonton (2000), creativity can achieve unique or unusual ideas. In its application in the learning process, four important abilities are a concerned: critical thinking, problem-solving, creative thinking, and collaboration (Sriwongchai et al., 2015). Related to this, the ability to think creatively and problem-solve has a close relationship. Creating creative ideas requires a good understanding of the problem. Creativity will be born because of the problem-solving process (Allen & Thomas, 2011; Kwon et al., 2006). So, to solve problems, it is necessary to have the ability to think creatively, and a good understanding of the problem is the basis for the birth of creativity. In Isaksen et al. (2010) also explains that creative thinking can create new solutions and solve problems. In line with this, Henriksen et al. (2014) explains that creativity is the process of making a new change by connecting current knowledge with existing ones.

Measures of creative thinking ability include fluency, flexibility, originality, and elaboration (Huang et al., 2017; Munandar, 2012; Sriwongchai et al., 2015). In Torrance (1984) and Wang et al. (1999) describe fluency as the ability to produce multiple answer; flexibility as the ability to create a variety of solutions; originality as the ability to create unusual/unique ideas; and elaboration as the ability to detail answers. According to Kharkhurin (2017), indicators of fluency and originality can be identified through initiatives. Research on creative thinking skills has been done a lot. In Guilford (1967) defines indicators of divergent thinking ability, namely fluency, flexibility, and originality. In research Siswono (2010) compiled five levels of creative thinking. The reparation of these levels is based on fluency, flexibility, and originality in solving problems. Each class has characteristics. Level 4 meets all indicators of creative thinking. Level 3 meets two indicators, namely fluency and originality or fluency and flexibility. Suppose it meets the aspect of flexibility or originality, including level 2. In level 1, the indicator that is completed is only fluency. Meanwhile, level 0 shows that it does not meet the indicators of creative thinking.

In the context of mathematics, creativity is defined as the ability of students to generate new or unique ideas (Leiken & Pitta-Pantazi, 2012). The relationship between mathematics and creativity lies in solving mathematical problems (Silver, 1997). In this case, the activity of identifying, formulating, experimenting, and applying concepts to problems. The researcher develops the relationship between problem-solving and aspects of creativity, namely fluency, flexibility, and originality. In line with these results, Tabach and Friedlander (2017) ensure that activities in mathematics require creative reasoning. For example, in simplifying the algebraic form of one variable, new ideas can be found for students. Based on the relationship between the two, Leikin et al. (2012) and Sternberg (2017) define creative students' profiles in mathematics and creative mathematics teachers.

Creativity is influenced by factors, one of which is personality (Puryear et al., 2017; Kandler et al., 2016; Hoseinifar et al., 2011). Included in the personal factors that support creativity are self-confidence (Martindale, 1989; Hahn & Lee, 2016), emotions (Copeland, 2016; Jaussi et al., 2017), motivation (Eccles & Wigfield, 2002; Hong et al., 2016), and self-efficacy (Karwowski, 2016). Self-confidence is defined as one's ability to achieve success (McClelland, 1987; Kiverstein et al., 2019; Nufus & Duskri, 2018). From the perspective of creativity, self-confidence is used to measure the characteristics of creative people. For creativity to emerge, one must be confident (Hahn & Lee, 2016). Confidence and creative thinking have a positive relationship in achieving goals (García Vidal et al., 2019). Confidence is needed in making a decision. Someone who has self confidence can help solve problems. In Hendriana et al. (2017) explain four leading indicators of self-confidence: believing in their abilities, making independent decisions, having an upbeat personality, and daring to express ideas. The explanation above shows the importance of confidence in creativity.

Mathematical ideas can be obtained in several ways: analyzing parts of mathematical ideas (Sitorus, 2020), connecting mathematical ideas (Evans, 1991; Hwang et al., 2007), and problem-solving. Students can connect mathematical concepts to find new combinations and then develop them. Students explore information, knowledge associations, identification of concepts related to ideas, and analogies of ideas to develop creative ideas (Mace & Ward, 2002). This activity is referred to as the conceptual or constructive stage (Ervynck, 1991). This explanation shows that connections in mathematics are needed to get creative ideas.

Based on the above background, previous research studies. In Treffinger et al. (2002), focus on five indicators of creative thinking ability, namely fluency, flexibility, originality, elaboration, and symbolic thinking. Creative thinking ability consists of several indicators: sensitivity, fluency, flexibility, originality, and elaboration (Arvyati et al., 2015; Toheri et al., 2019). In Sukestiyarno et al. (2021) defines six indicators of creative thinking skills, namely sensitivity, fluency, flexibility, originality, collaboration, and elaboration. To Zubaidah & Corebima (2021), creative thinking is a person's ability to explore problems, formulate hypotheses, and find new solutions to these problems. This ability has an essential function in developing knowledge and creating ideas. Research by Prasetyowati & Dwijanto (2019) suggests that students who have high self-confidence achieve aspects of fluency, flexibility, originality, and elaboration. Students in the low self-confidence category achieve fluency and elaboration indicators (Ratnasari et al., 2020). The indicator of creative thinking achieved by each category of self-confidence is fluency.

Based on previous research studies, what distinguishes this research is the aspects of fluency, flexibility, originality, connection, and elaboration. Specifically for the connection indicator, it is defined to find the relationship between the information obtained and the core of the problem. Thus, the focus of the research is "how is the creative thinking ability of students in solving mathematical problems in terms of self-confidence?"

Literature Review

Creative Thinking Skills

In Lince (2016), a person's ability to solve problems using different solutions from what is routinely done is called creative thinking. One of the characteristics of creative thinking is to organize ideas and then develop them into new solutions. Activities to encourage creative thinking skills can be done by discussing and working on questions with a high difficulty level. The indicators used to determine creative thinking include fluency, namely being able to solve problems by providing various descriptions/answer statements; flexibility means being able to use a variety of different solutions to solve problems; originality is defined as creating a unique/unusual concept that can be used; Meanwhile, elaboration reflects a person's skills to describe a statement in detail. In Aldalalah (2021) explains that seeing things from a different and unique point of view is the character of creative thinking. Starting from something that is not clear then understood until finding a pattern to formulate a solution. People who have the ability to think creatively and can apply it in solving problems are called innovative. This trait can develop new ways that have not been thought of before and quickly adapt to any conditions. The development of science can be achieved with creative thinking. The more people who can think creatively, the more science will continue to grow. In addition, Corebima et al. (2017) explains that creative thinking will create a generation that can solve social and environmental problems. In the learning environment in the classroom, an educator has a vital role. The character of each person is different, so it requires learning conditions that can develop creative thinking. Many activities can be done to develop creative thinking skills, including asking questions that stimulate thinking, using fun teaching methods, and observing logical thinking activities to create new ideas. In creative thinking, fluency is defined as generating several ideas to solve problems. Flexibility is defined as the skill of creating diverse and different ideas. Meanwhile, originality is the ability to create unfamiliar/rare idea. In this study, the indicators used to measure creative thinking skills include fluency, flexibility, originality, connection, and elaboration. Table 1 explains the definition of each indicator.

Table 1
Indicators of creative thinking ability

Indicator	Description
Fluency	ability to write different answer
Flexibility	ability to produce different solutions
Originality	ability to create unfamiliar/unique ideas
Connection	ability to find relationships between concepts
Elaboration	ability to detail answers

Self Confidence

Creative thinking can be built with self confidence. Someone who has good self confidence can help create an innovative idea. Self confidence is the belief that a person can rise, have the character to be better, and eliminate negative behavior (Indriani et al., 2019). Some characteristics of people who have self confidence is believe in their

talents, independence in decision making, having a positive self concept, and having the courage to convey ideas (Surya & Putri, 2017).

Confidence is influenced by several factors, including family, formal schools, and non-formal schools (Fatimah, 2010). First, family is the immediate environment that supports self-confidence. The support of all elements of the family is very important. Appreciating each family member's abilities is the beginning of the process of building self-confidence. Second, formal school is a second learning environment for children. Students can show their abilities to their friends. Schools provide a place for students to develop their abilities. This will support the formation of self-confidence. Third, non-formal schools. This place will be a complement in development abilities. Students can show their expertise to others so that they can invite admiration. This will strengthen the level of confidence.

METHOD

Research Design

This type of research is descriptive qualitative. This research focuses on describing the ability to think creatively based on self-confidence. This study involved students who took the Differential Calculus course in the Mathematics Education study program at Muhammadiyah University of Purwokerto, Indonesia. The number of students who participated was 60 people. Students were grouped into three sections based on the self-confidence questionnaire scores: low, moderate, and high. Each of the three categories was chosen by two people as research subjects using the purposive sampling technique. The sampling technique with special considerations is purposive sampling (Sukestiyarno, 2020). The number of subjects involved is six people. The description of creative thinking skills was obtained from the creative thinking ability test results and in-depth interviews of the six subjects. Figure 1 below describes the qualitative research design.

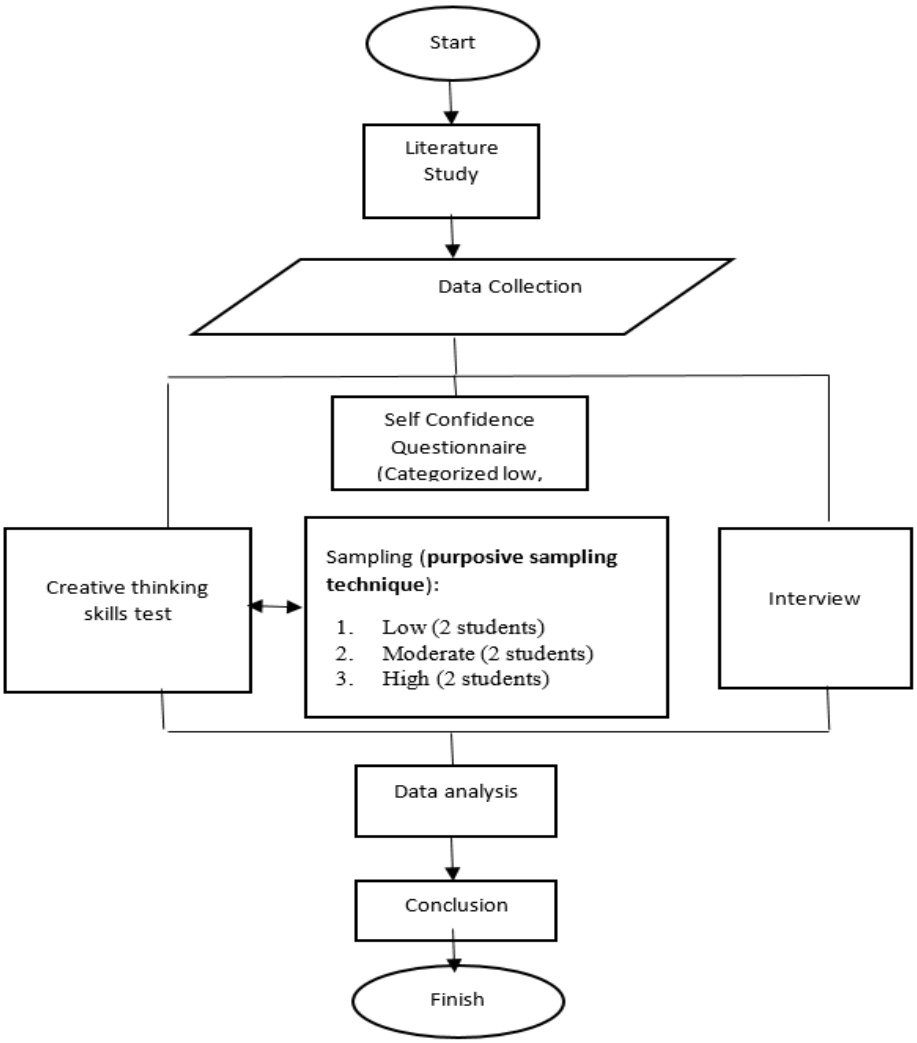


Figure 1
Qualitative research design

Data Collection

Data collection is based on instruments consisting of self-confidence questionnaires, creative thinking tests, and interviews. The questionnaire contains questions that are relevant to the indicators of self-confidence. The number of questions is 24, with a rating scale of 1 (never) to 4 (always). Categorization of self-confidence based on the score of the questionnaire.

The test questions used are open-ended. The material used is related to the limit of the function. Questions are made to adjust the curriculum applicable in higher education on core competencies, essential competencies, and material indicators. To fulfill the validity aspect, the questions to be used are re-examined by expert judgment. Researchers also conducted a limited test on the test instrument to be used. The validation results conclude that the question of creative thinking skills is valid and reliable. The next instrument is the interview. The interview process was conducted face-to-face with the research subject. The discussion focused on information related to creative thinking skills based on written test results.

Data Analysis

Components of data analysis using the interactive model of Miles and Huberman, namely data reduction, presentation, and concluding (Sugiyono, 2015). This activity includes summarizing the data obtained, selecting the necessary data, and organizing the data so that conclusions can be drawn and adapted to the research topic. The reduced data relates to thinking creatively in terms of self-confidence. Furthermore, the data is presented by telling the research results in the form of pictures, descriptions, and tables regarding the ability to think creatively and describe in detail. The final analysis stage is to conclude. Explain the findings obtained from student answers and interviews regarding creative thinking skills. A triangulation test was carried out for the credibility of the data by comparing the creative thinking test data and the results of student interviews.

FINDINGS

The research begins by giving a self-confidence questionnaire. Of the 60 students, the results of the self-confidence questionnaire showed that 12 students were in a low category, 23 students were in the moderate category, and 25 students were in the high category. Two subjects were taken from each category. Researchers compared test results with in-depth interviews to analyze students' creative thinking skills. Following are the results of the analysis on each subject.

Low Self Confidence Group

In this group, there are two research subjects, namely subject 1 and subject 2. The following is an analysis of the creative thinking abilities of the two subjects.

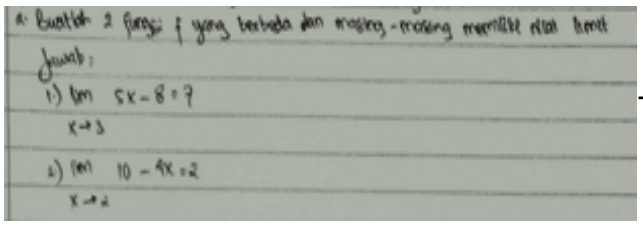


Figure 2
The results of subject 1 answer in the aspect of fluency

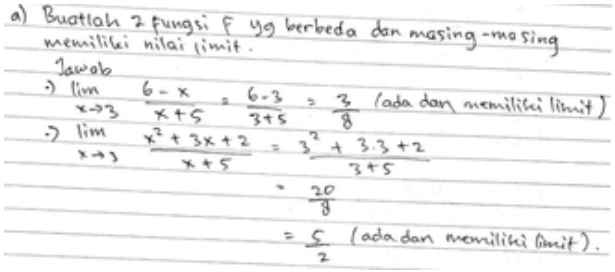


Figure 3
The results of subject 2 answer in the aspect of fluency

Figure 2 and Figure 3 each show students are writing down two different answers. The question relates to a function that has a limit value. Subject 1 wrote using a linear function to answer the question. The pattern of the two answers is the same, meaning that students only change the variable coefficient. Meanwhile, subject 2 uses a rational function in answering questions. The two answers at a glance, there is no difference, only changing the coefficients.

Figure 4 and Figure 5 below describe the aspect of flexibility in answering problems.

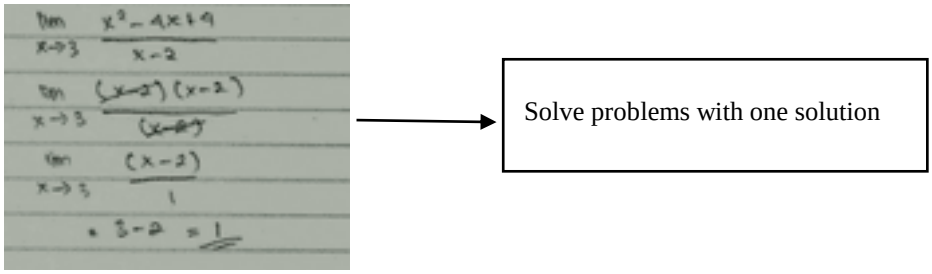


Figure 4
The results of subject 1 answer in the aspect of flexibility

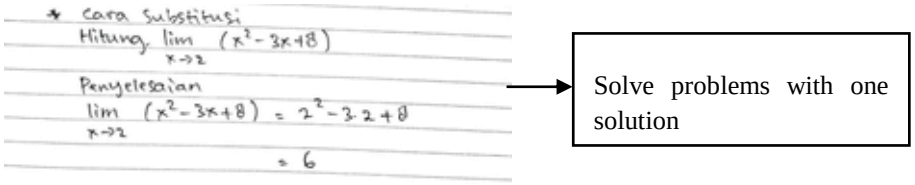


Figure 5
The results of subject 2 answer in the aspect of flexibility

Figures 4 and 5 each explain that students cannot write different ways of solving them. Subject 1 only uses factoring rules to determine the limit value. The functions used are different from those reported in the previous number. The answer written is correct. For subject 2, the solution used to determine the limit is the substitution method. The

function used is polynomial, more precisely quadratic. The written function is different from the previous one.

Next, the answers of subjects 1 and 2 to the aspect of originality.

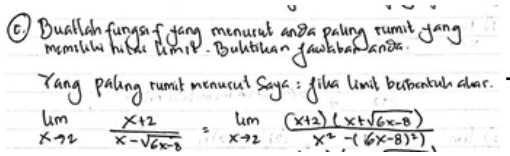


Figure 6. The results of subject 1 answer in the aspect of originality

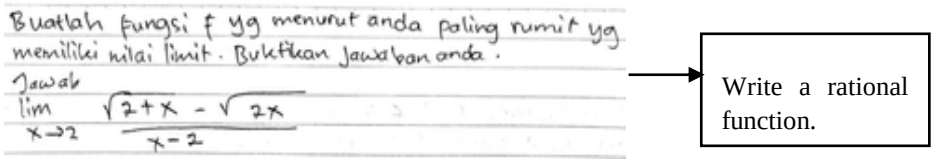


Figure 7
The results of subject 2 answer in the aspect of originality

On the aspect of originality, subjects 1 and 2 each wrote their answers as usual. In the problem lattice, unusual functions are other than polynomial and rational functions. Figure 6 shows a rational function. Not different from the previous picture, Figure 7 also answers with a rational function. So that the subject does not fulfill the originality aspect. The interview conclusion explained that the subjects did not want to try more complicated functions. Whereas previously never encountered a complex function. This shows an attitude that does not believe in his abilities. The following is an excerpt of an interview with subject 1 in outline.

Question : Why did you write this function? Not another function.

Answer : In my opinion, because I am used to using this function and can do it.

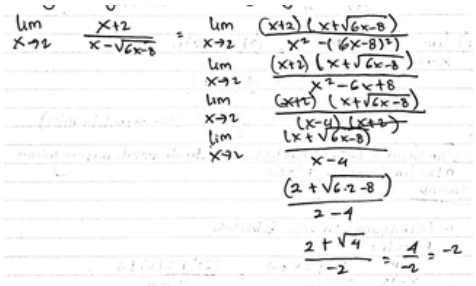
Question : Have you ever encountered a complex function?

Answer : Yes. I once came across a function and found it difficult to answer it. However, when looking at this problem, what comes to mind is a rational function.

Question : Have you ever tried it?

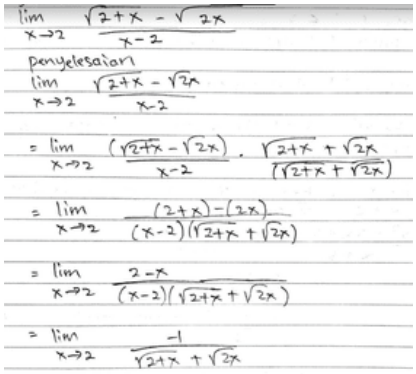
Answer : No. Because I'm not sure I can solve it

Furthermore, the image below describes the connection aspect.



Solve the problem by multiplying the roots of a group. No other concepts are obtained from connecting between concepts

Figure 8
The results of subject 1 answer in connection aspect



Solve the problem by multiplying the roots of a group. No other concepts are obtained from connecting between concepts

Figure 9
The results of subject 2 answer in connection aspect

In the connection aspect, subject 1 only uses the concept of factoring. In Figure 8, the subject does not combine other knowledge to solve the problem. Similar to subject 2, to answer questions, students apply the rules of rationalizing the denominator, namely multiplying each numerator and denominator by their common root. Figure 9 does not show any other concepts used. So, in this case, each subject does not fulfill the connection aspect.

For the elaboration aspect, subjects 1 and 2 each checked the answers written down. However, the re-examination process was not carried out in detail because the processing time had run out. Following are the results of interviews with students:

Question : When you're done, do you recheck your answers?

Answer : Yes, that's right

Question : Did you check the answers in detail for each question number?

Answer : No. I checked it only briefly because the processing time was up.

Moderate Self Confidence Group

The subjects used in the category of moderate self-confidence are subject 2 and subject 3. The results of the analysis of creative thinking skills will be explained below.

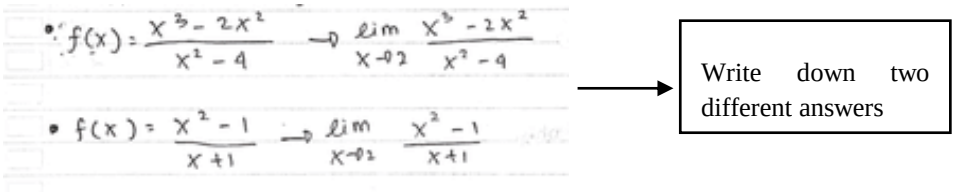


Figure 10
The results of subject 3 answer in the aspect of fluency

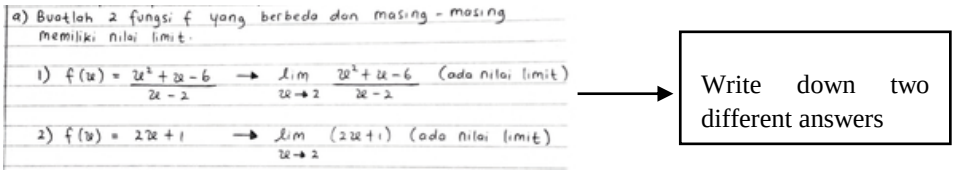


Figure 11
The results of subject 4 answer in the aspect of fluency

In the aspect of fluency, both subjects 3 and 4 each wrote two different answers. Subject 3 students wrote the limits of rational functions. However, do not write down the limit value. It can be seen in Figure 10. While in Figure 11, subject 4 uses two different functions, namely linear and rational functions. The student only provided information about the limit value but did not write down how to get it in detail.

Figure 12 and Figure 13 below show the aspect of flexibility in answering questions.

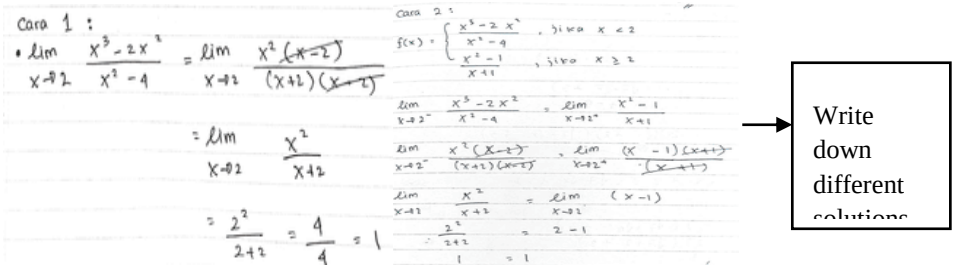


Figure 12
The results of subject 3 answer in the aspect of flexibility

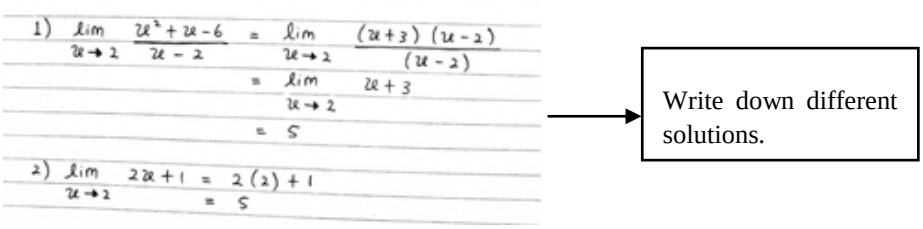


Figure 13
The results of subject 4 answer in the aspect of flexibility

Subject 3 students used the factoring method and the concept of limit inequality. The functions used in the first and second methods have pattern inequalities. The function used in the second method is a modification of the first. This is indicated by the limit value of the two ways being the same, namely 1. It can be seen in Figure 12. Meanwhile, the methods used by Subject 4 to determine the limit value are direct substitution and factoring.

Next, the originality aspect will be explained, namely, writing unusual or unusual answers.

Figure 14
The results of subject 3 answer in the aspect of originality

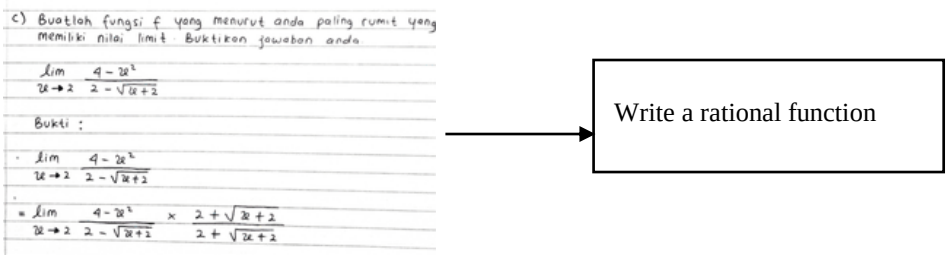


Figure 15
The results of subject 4 answer in the aspect of originality

The essence of this question is to measure the aspect of originality. Based on the picture above, each subject 4 and 5 wrote a rational function. In this case, the rational function is not complex. Thus, students have not reached the originality indicator. In the process, students use the method of rationalizing the denominator, namely multiplying by common roots, as can be seen in Figure 14 and Figure 15.

The next creative thinking ability is the connection aspect, which is looking for a relationship between the knowledge that has been obtained. Here's the explanation.

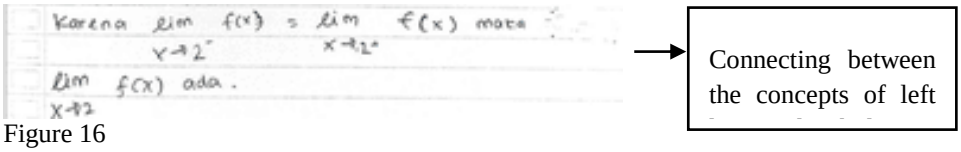


Figure 16
Results of subject 3 answer in connection aspect

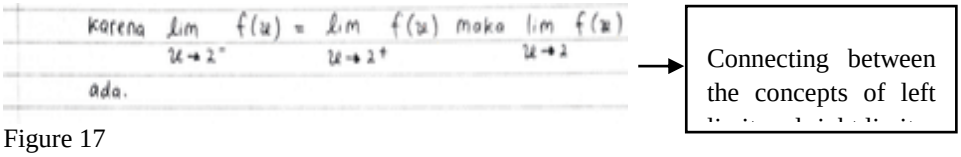


Figure 17
Results of subject 4 answer in connection aspect

Figure 16 and Figure 17 show that students write down the relationship between limit, left limit, and right limit. It is clear that for the limit value of the function to exist, it must satisfy the inequalities of the left and right limits. If these conditions are not met, then the limit value does not exist. Knowledge of left and right limits has been obtained in previous education. Thus, students only need to recall and then relate to the problem.

Next, on the elaboration indicator, both subject 3 and subject 4 checked again the answers that had been made. Starting from writing symbols, formulas, and the solution flow. The results of the interviews with each subject are outlined below.

Question : What do you do after you finish working on the questions?

Answer : I rechecked the answers in order starting from the first number.

Question : What did you check?

Answer : I checked the symbol, the formula, then the solution steps.

Question : Did you find any error regarding this?

Answer : Yes, but fixed right away.

High Self Confidence Group

In the self confidence group with a high level consisting of two students, name subject 5 and 6. The following is an explanation of the ability to think creatively shown by each indicator.

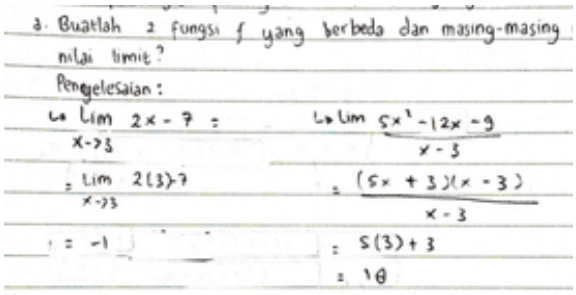


Figure 18
The results of subject 5 answer in the aspect of fluency

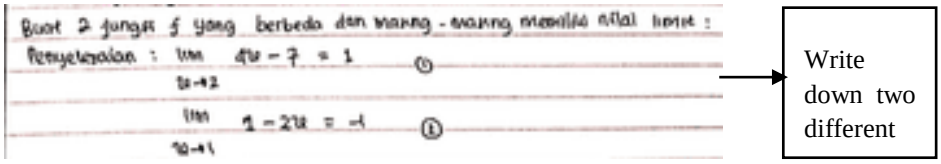


Figure 19
The results of subject 6 answer in the aspect of fluency

Figure 18 depicts subject 5 fulfilling the fluency aspect. Because it can write two different answers. In this case, students write down linear and rational functions, respectively. Subject 5 also explains in detail the steps to determine the limit value. While in Figure 19, subject 6 uses a linear function. The first and second answers differ only in the coefficients. However, the student did not write down the details, meaning he immediately mentioned the limit value.

The next aspect is flexibility. The following figure describes subjects 5 and 6 using different ways to solve the problem.

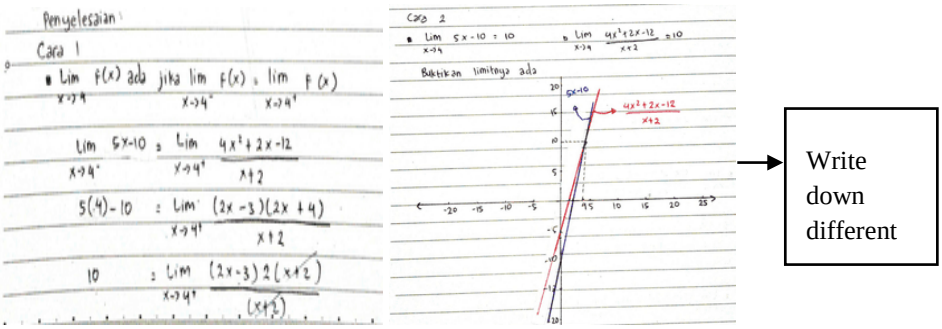


Figure 20
The results of subject 5 answer in the aspect of flexibility

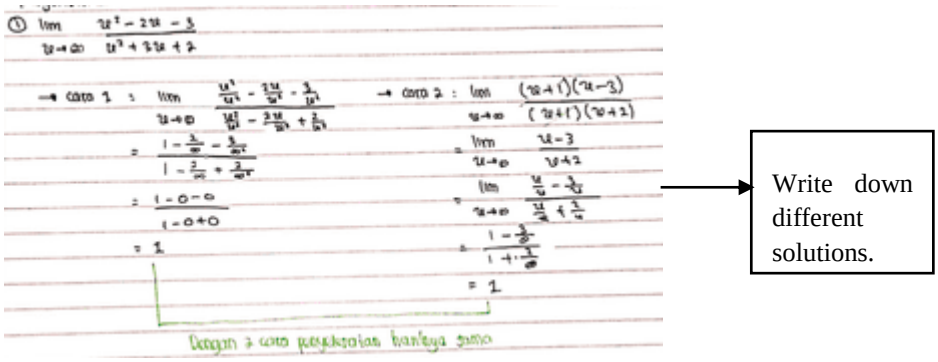


Figure 21
The results of subject 6 answer in the aspect of flexibility

There is something unusual about the answers written by subject 5. As shown in Figure 20, students use two different methods, namely the left-right limit and the graph method. Especially for the graph method, most students very rarely use it. However, subject 5 answered by drawing a graph of the function, and the result was correct. In answer to subject 6, students use the infinite limit approach. In Figure 21, it can be seen that the system used is an infinite limit. However, the method used is different, namely dividing by the variable with the highest rank and factoring. The results obtained using both ways are correct.

Furthermore, Figures 20 and 21 will explain the originality aspect of creative thinking skills.

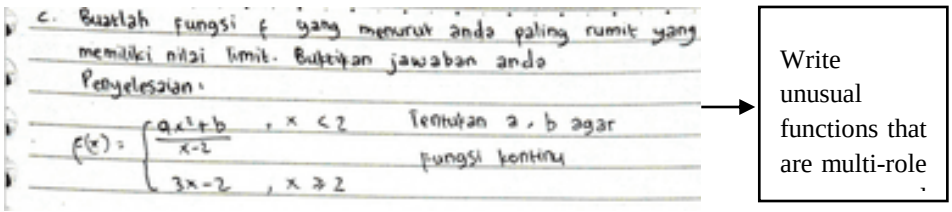


Figure 22
The results of subject 5 answer in the aspect of originality

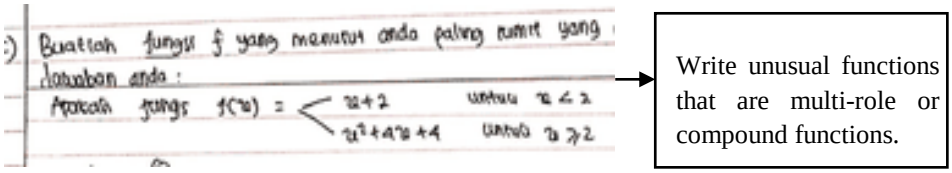
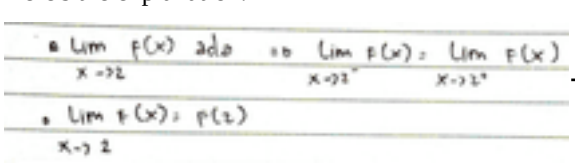


Figure 23
The results of subject 6 answer in the aspect of originality

Figure 22 shows that subject 5 students wrote an unusual function. The function in question is a compound function. This function consists of several functions, namely

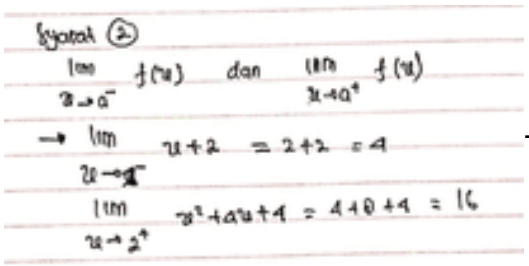
rational functions, and linear functions. Another unique thing is that subject 5 uses coefficients a and b, whose values are unknown. Meanwhile, the subject also wrote the same function, namely a compound function. It's just that the compound function in Figure 23 includes a linear function and a quadratic function. This compound function is unusual for students because of the difficulty in compiling, understanding, and determining the limit value.

The next aspect is no less important, namely connection. In this aspect, students look for the relationship between the knowledge gained and the problem to solve the problem. Here's the explanation.



Connecting between the concepts of left limit and right limit

Figure 24
Results of subject 5 answer in connection aspect



Connecting between the concepts of left limit and right limit

Figure 25
Results of subject 6 answer in connection aspect

Subject 5 writes down the conditions for the existence of a limit value if the left limit and right limit are the same. It can be seen in Figure 24. This knowledge has been previously acquired. Students use concepts to answer limit values because they already know the relationship between compound functions and ideas. In addition, the ease of doing work is the reason students apply it. Meanwhile, Figure 25 explains that subject 6 uses concepts to solve problems. This concept is derived from finding the relationship between the limit and the given situation. Following are the results of interviews with subject 5:

Question : Why do you use the concept of left limit and right limit to solve the problem?

Answer : The first thing that comes to mind is the concept. I'm trying to relate the problem to general information.

Question : Have you ever received this knowledge before?

Answer : Yes. I got the material when I was in my previous education and found it easy to apply it to problems.

Question : Are you sure this concept can solve the problem? What's your reasoning?

Answer : Yes, I am sure. Usually, the left and right limits are used for functions with many rules because they consist of two conditions. So, I imagine there is some relevance between multi-role or compound functions and limits.

Based on the interview above, students with high self-confidence can answer questions, dare to try in different ways, and provide arguments. Confidence in the concepts used to solve problems is built by several factors, including previously acquired knowledge, good concept understanding, and sensitivity. Students who have good self-confidence will be able to solve problems.

The last aspect of creative thinking skills is elaboration. Subjects 5 and 6 each checked the written answers again. The remaining time is used to check the completion steps, then correct if there is a calculation error. The following is an interview with a subject who has high self-confidence.

Question : What do you do after you finish working on the questions?

Answer : I looked back at the response from the beginning

Question : Did you find an error?

Answer : Yes, I found there was a miscalculation, and I corrected it. Starting from the number of the first question until the last I rechecked

DISCUSSION

The ability to think creatively and self-confidence are two interrelated things. A person's creative thinking is influenced by self-confidence (Martindale, 1989; Hahn & Lee, 2016). In line with this Yaniawati et al. (2020) explained that self-confidence always develops creative thinking skills. Self-confidence is built by a positive attitude and belief in problem-solving. Davis (1986) also explains that self-confidence is one of the characteristics of creative thinking.

Based on the study results, subjects with low self-confidence were able to write two different answers (fluency), re-check the answers that had been written, and correct writing errors (elaboration). This condition is in line with research Ratnasari et al. (2020) that low self-confidence can meet the aspects of fluency and elaboration. Subjects in this category do not want to answer differently, meaning they only focus on specific knowledge. Even though they already have prior knowledge, they don't want to try other methods. This causes the knowledge gained to be minor. In line with research Jahani & Behzadi (2014) and Trisnawati et al. (2018), people with low self-confidence will lack knowledge.

For moderate self-confidence category subjects who can answer questions with different answers (fluency), solve problems from different perspectives (flexibility), and re-examine the completion steps from beginning to end (elaboration). This is in line with Ratnasari et al. (2020) that fluency, flexibility, and elaboration indicators can be met at a moderate confidence level. However, this research contradicts Prasetyowati & Dwijanto

(2019), which explain that subjects with a reasonably confident category have successfully fulfilled the originality aspect.

Furthermore, subjects in the high self-confidence category met all indicators of self-confidence, ranging from fluency, flexibility, originality, connection, and elaboration. In line with research Winarsih & Kadarisma (2018), self-confidence is directly proportional to the ability to think creatively. If you have high self-confidence, then the ability to think creatively will also increase. The same thing was also stated by research Siswono (2011), explaining the level of creative thinking ability in five classes. At a good level of creative thinking, students solve problems that do not focus only on specific solutions (flexibility) and generate unusual ideas (originality). Based on the findings of this study, the subject carries out activities to connect ideas or concepts to produce original ideas. A more appropriate term is connection. In Sitorus (2016) explains that the stages of the creative thinking process include connecting between concepts needed to solve problems. In line with this statement, Wati & Musdi (2018) state that creative thinking is the process of finding new ideas obtained from correlations between concepts. Research by Maknun & Siahaan (2017) applies the ICARE method approach to creative thinking skills. It is proven that ICARE can increase creative thinking. At ICARE, activities connect new knowledge with previous knowledge where the two are interrelated. It is proven that connection is necessary to increase creativity. Creative ideas are obtained from connecting mathematical concepts (Evans, 1991; Hwang et al., 2007). This is also reinforced by research Bacanlı et al. (2011), which describes four dimensions of creative thinking: making connections. In this case, connecting several different mathematical objects, which had never existed before, then arranged into something new. In Barr et al. (2015) also explains that in creative analogical reasoning, one must have the ability to manipulate the relationship between different elements to find new concepts.

CONCLUSIONS

The results of this study illustrate that self-confidence is an important aspect of developing creative thinking skills. Students with low, moderate, and high self-confidence categories can each write different answers, then recheck the answers before work time runs out. Students in the moderate confidence category can answer questions using different solutions. Students in the high self-confidence category can find relationships between concepts to be applied in solving problems and write different or unique answers. These results indicate that higher self-confidence impacts the achievement of creative thinking skills.

The simple implication of this research is to provide information that an attitude of self-confidence can support the ability to think creatively. Confidence in mathematics is shown by solving problems with the knowledge they have. Students can develop self-confidence through a good understanding of concepts, previous experience, and mathematical communication.

Limitations in this study lie in the affective aspects and research subjects. The affective aspect used is limited to self-confidence. The subjects used are students at the university

level who already have a lot of experience, so self-confidence has been formed. This research can be continued at the secondary school level. Other recommended aspects relate to cognitive, for example, executive function. A study by Benedek et al. (2014) explains the involvement of cognitive functions in the creative thinking process.

ACKNOWLEDGMENTS

The authors wish to thank the LPIP Universitas Muhammadiyah Purwokerto and Universitas Negeri Semarang for giving the support in this research.

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