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Primary students' creative thinking in solving mathematical literacy problems

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ABSTRACT

In general, the creative thinking of primary students is still low. Meanwhile, creative thinking is needed for students to solve problems more innovatively. On the other hand, solving skills in mathematical literacy are needed for students to solve real problem contexts. Empirical phenomena show the existence of students' creative thinking in solving mathematical literacy problems. While existing studies have not been able to analyze it. This study aimed to analyze primary students' creative thinking in solving mathematical literacy problems. The research used a qualitative method with a case study design. The research subjects were 15 fourth-grade primary students grouped based on high, moderate, and low levels of each creative component (fluency, flexibility, originality, and elaboration). Instruments used tests and interviews. Data analysis used data reduction, presentation, and conclusion, as well as triangulation. The findings of this study are that primary students' creative thinking has a low level in all components of creative thinking. In this case, the components of creative thinking from highest to lowest, namely fluency, originality, elaboration, and flexibility. Based on this, high, moderate, and low types of creative thinking can be categorized. High and moderate types of creative thinking are dominant in flexibility and originality. Meanwhile, low-type creative thinking is dominant in terms of fluency and elaboration. The implications of the study suggest that educators can further elaborate on the aspects of creative thinking in terms of flexibility and originality so that students can reach high levels of creative thinking. Future studies are recommended to analyze further the factors of mathematical literacy that affect students' creativity levels, such as formulation, employ, and interpretation.

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INTRODUCTION

Creative thinking is an essential skill in 21st-century education that enables individuals to generate new ideas and innovative solutions in the face of complex challenges (OECD, 2024). In the context of education, this skill enables students to develop innovative solutions to complex problems they face, both in the academic environment and in everyday life (Supriatna, 2019). Implementation of creative thinking in learning practices encourages students to explore various approaches to understanding the material, thus enhancing their understanding and retention of knowledge (Lestari, 2022). In addition, in real life, creative thinking skills help individuals to adapt to rapid changes and find new ways to solve problems that arise (Amiroh & Indrawati, 2022). In Indonesia, the development of creative thinking skills among students is crucial to prepare them for the dynamics and complexity of the modern world (Nursaya'bani et al., 2025).

Primary students have a basic need for creative thinking to equip them to face the challenges of life in the future. This skill allows students to solve problems innovatively and create new and valuable solutions in various aspects of life (Marni & Pasaribu, 2021). Creative thinking encourages primary students to understand the material deeply and apply their knowledge in diverse situations (Hidayah et al., 2021). In addition, in the learning process, students accustomed to creative thinking tend to be more active and able to develop original ideas, which improves their academic performance. In addition, familiarizing primary students with creative thinking in the daily learning process must help them solve problems innovatively (Fi & Amir, 2023). Therefore, further study is needed to identify the creative thinking of primary students.

Study on creative thinking in solving mathematical literacy problems is crucial for understanding how primary students generate ideas to solve real-world problems. Utami & Amir (2023) state that primary students undergo logical processes of formulating, using, and interpreting to tackle literacy problems. Additionally, students engage in reasoning and experience essential mathematical processes (Harisman et al., 2023). While many studies highlight this, qualitative study provides deeper insights into students' creative thinking. Febrianti et al. (2022) revealed that a qualitative approach effectively uncovers students' thought processes, strategies, and mindsets in solving mathematical problems. Furthermore, analyzing students' creative thinking offers valuable insights into how they interpret and manipulate mathematical information to produce original and effective solutions (Nurdiana & Caswita, 2024).

Previous study have shown that primary students struggle with creative thinking and mathematical literacy. Many students face difficulties solving non-routine problems that require creativity and tend to rely on teacher-taught methods without exploring alternatives (Nurdiana & Caswita, 2024). Hanifah et al. (2024) confirmed that most students could only meet one or two of the four creative thinking indicators: fluency, flexibility, originality, and elaboration. Regarding mathematical literacy, students cannot often interpret and solve real-world mathematical problems effectively (Sabilah & Nuh, 2024). Utami & Amir (2023) found that primary students struggle to generate diverse solutions in mathematical literacy tasks. This problem is concerning as Fi & Amir (2023) warned that weak creative thinking skills may negatively impact students' academic success and preparedness for future challenges.

To explore the phenomenon's existence, creative thinking in solving mathematical literacy problems by primary students is still relatively low. Researchers conducted a preliminary study at SDN Mergosari 1, Tarik, Sidoarjo, based on mathematical literacy, which demands a diversity of ideas from the study (Utami & Amir, 2023). Students were

asked to solve problems with various solving strategies regarding the determination of what round two wheels with different sizes juxtaposed together would come together for the first time. The first wheel has 15 teeth, while the second has 20 teeth. Figure 1 shows one of the students' answers.

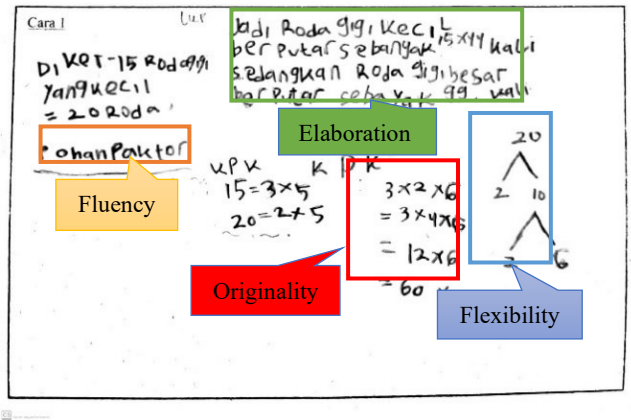

Figure 1. Phenomenon Creative Thinking by Primary Students

From the point of view of analyzing the components of creative thinking, fluency, flexibility, originality, and elaboration (He, 2017). Figure 1 shows that primary students have creative thinking in solving mathematical literacy, but there are errors in each component. In fluency, students can only mention the solution strategy using a factor tree, even though there are other ways, such as the smallest common multiple. In the flexibility aspect, students could not connect the concept of the least common multiple with the factor tree. In the originality aspect, students only imitate the procedural solutions they recognize. In the elaboration aspect, the student's interpretation of the solution failed because the concept of the least common multiple was not connected to the solution procedure. Therefore, there is a phenomenon of different levels of creative thinking in solving mathematical literacy problems in primary students.

Existing qualitative studies on creative thinking and mathematical literacy in the context of problem-solving for primary students have been conducted separately and, to date, can be categorized into two groups. First, studies on creative thinking in mathematics in primary students without related mathematical literacy solutions. Among them by distinguishing the analysis review, such as the level of mathematical ability (Hidayah et al., 2021), differences in reflective and impulsive cognitive styles (Herianto & Hamid, 2020), the use of open-ended problems (Wahyuni & Palupi, 2022) and story problems (Hidayah et al., 2021), and problem posing (Trisanti et al., 2025). Second, studies on analyzing mathematical literacy by focusing on numeracy skills in various contexts, such as in mathematics subjects (Atsilnaura et al., 2024), solving number problems (Sulastri et al., 2024), ethnomathematics comics (Fakhriyah & Merliza, 2024), geometry problems (Ratnasari & Setiawan, 2022), differences in students' cognitive levels (Herianto & Hamid, 2020). So, no previous study explicitly analyzes the relationship between the analysis of creative thinking and solving mathematical literacy.

Thus, previous studies still leave a gap on how primary students' creative thinking is used in solving mathematical literacy problems. Researching how primary students' creative thinking in solving mathematical literacy problems is important because creativity allows students to find innovative solutions to real-world problems (Khalid et al., 2020). On the other hand, mathematical literacy requires understanding concepts and flexible thinking skills in applying various strategies (Liljedahl, 2021). Therefore, by

understanding creative thinking patterns, educators can design learning methods that are more effective in developing problem-solving skills (Schoevers et al., 2021). In addition, this study can improve the quality of mathematics education by knowing the depth of creative thinking of primary students and the challenges of solving mathematical literacy problems faced by primary students. Therefore, this study aims to analyze primary students' creative thinking in solving mathematical literacy problems.

METHOD

The research method used is qualitative with the type of case study. A case study is a method of analyzing a case. According to Creswell (2018), a case study is a design that investigates one or more cases in the context of the real world. This study's traced case studies are observations, interviews, and document analysis. It gave students creative thinking depth in solving mathematical literacy problems.

The research subjects were 15 primary students at the fourth-grade level at SDN Mergosari 1, Tarik, Sidoarjo. The reason for choosing SDN Mergosari 1 as the study location was because, at this location, the phenomenon of students' creative thinking in solving mathematical literacy problems appeared during the preliminary study. Meanwhile, 15 students were determined as research subjects by purposive criteria, indicating creative thinking levels in each creative thinking component (fluency, flexibility, originality, and elaboration). Meanwhile, 3 students were determined as subjects, namely each subject with the highest level of creative thinking in solving mathematical literacy problems in each component of fluency, flexibility, originality, and elaboration, namely high, moderate, and low. These categories were determined through the test scores (Shafa et al., 2023), where students with scores of 81-100 were categorized as very high, 41-60 as moderate, and 21-40 as low.

The instruments used in this study include creative thinking tests for solving mathematical literacy problems and interview guidelines. The creative thinking test in solving mathematical literacy problems is in the form of one mathematical literacy problem adapted from Ekawati et al. (2019). This test aims to measure the four components of creative thinking that will be studied. The first is fluency, which can provide several ideas and relevant answers. Flexibility is giving many answers or being able to produce a work. Originality is being able to provide answers with new ideas, and elaboration is being able to provide answers that students do specifically and a few additional ideas to convey information in detail (He, 2017). Meanwhile, the interview guideline compiled semi-structured questions about what, why, and how each component of creative thinking is done by students in solving mathematical literacy problems. Mathematical literacy problems can be seen in Figure 2.

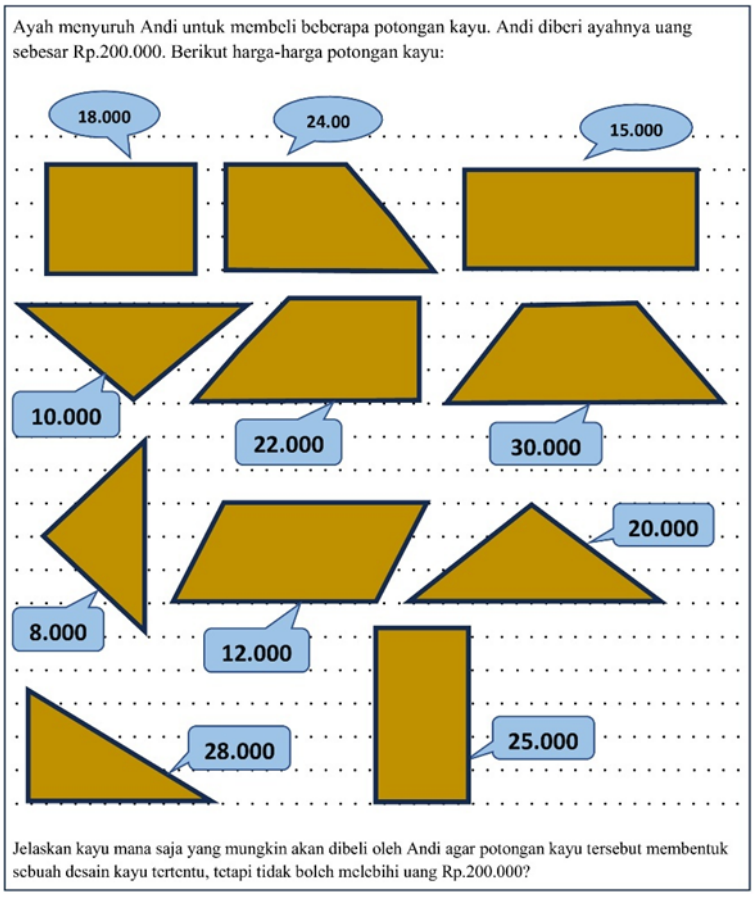

Figure 2. Mathematical literacy problems

Data analysis techniques are done by reducing data, presenting data, and making conclusions. Meanwhile, the data validity test uses triangulation. The data validity test needed is documentation of observation results, creative thinking test results, and interview results. All data sources of creative thinking students will be analyzed based on indicators of creative thinking students in solving mathematical literacy problems. Indicators are presented in Table 1. In comparison, to categorize creative thinking using Table 2.

Table 1. Indicators of Creative Thinking

Indicators	Description
Fluency	Fluency in opinion and generation of ideas
Flexibility	Thinking flexibly from different angles and directions
Originality	Solving problems with new ideas
Elaboration	Opinionated in presenting answers and ideas

Table 2. Categories of Creative Thinking

Score	Category
81-100	Very high
61-80	High
41-60	Moderate
21-40	Low
0-20	Very Low

Table 3. Instruments and Indicators of Creative Thinking

Indicators	Instrument	Data Analysis
Fluency	- Creative Thinking Test - Sample interview item: Have you ever solved problems like this before?	- Reduction, presentation, and conclusion - Triangulation
Flexibility	- Creative Thinking Test - Sample interview item: How many ways of solving did you use?	- Reduction, presentation, and conclusion - Triangulation
Originality	- Creative Thinking Test - Sample interview item: Did you use your own way of thinking?	- Reduction, presentation, and conclusion - Triangulation
Elaboration	- Creative Thinking Test - Sample interview item: Explain how you think to solve the problem in the problems?	- Reduction, presentation, and conclusion - Triangulation

The research procedure uses three stages of case study: (1) define and design, (2) prepare, collect, analyze, (3) analyze and conclude (Creswell & Guetterman, 2019; Yin, 2018). Define and design relate to designing the study before data collection is carried out. Preparing, collecting, and analyzing relates to focusing the process of conducting a case study on the initial data analysis. Analyze and conclude relates to cross-case analysis to obtain more in-depth conclusions. The study flow is shown in Figure 3.

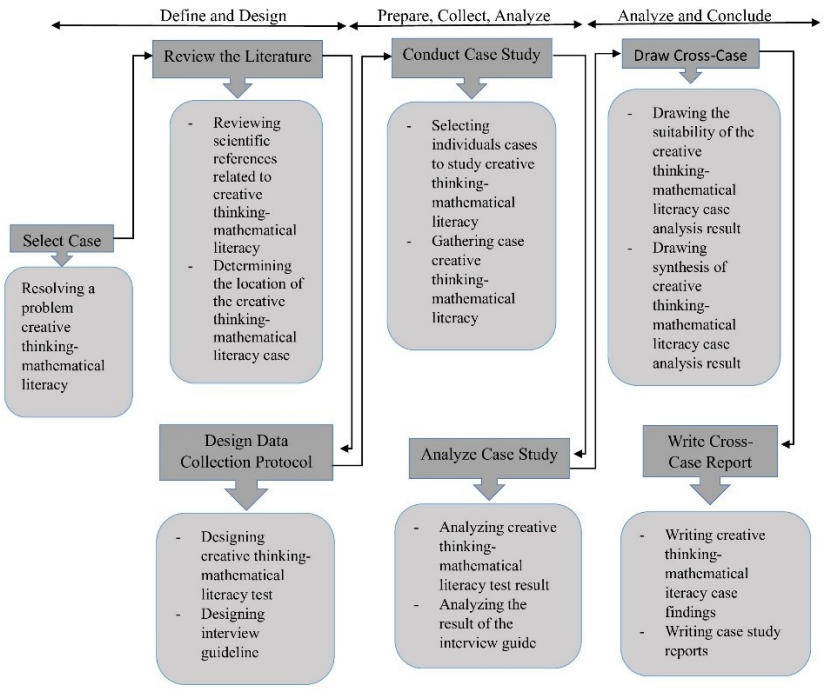

Figure 3. Study Flow of Case Study

First, the define and design stage. This stage includes: (1) Select case. Finding and determining the case at the study site, namely the phenomenon of the emergence of creative thinking primary students in solving mathematical literacy problems. (2) Review the literature. Conduct a literature review of indicators of creative thinking and characteristics of mathematical literacy problems. (3) Design data collection protocol. Compile study instruments, including a creative thinking test for mathematical literacy and interview guidelines. Second, at the prepare, collect, and analyze stage. This stage includes: (4) Conduct a case study. Selecting students as study subjects based on the criteria set and collecting data through tests and interviews. (5) Analyze the case study.

Processing and analyzing the results of creative thinking tests and interviews to get an initial picture of students' creative thinking patterns in solving mathematical literacy problems. Third, at the analyze and conclude stage. This stage includes: (6) Draw cross-case. Comparing the results of the analysis of each subject to assess their suitability and find patterns of creative thinking students. (7) Write a cross-case report. Integrate the results of cross-case analysis to obtain conclusions based on instrument data.

RESULT AND DISCUSSION

The study began with visiting the schools one by one. After that, the researcher gave a test in the form of PISA-like mathematical literacy questions. Each study subject was given a test question consisting of one problem. After working on the problem, the researcher interviewed the students. Table 4 shows the results of creative thinking skills.

Table 4. Score Skills Creative Thinking

Indicators	Score	Category
Fluency	40%	Low
Flexibility	30%	Low
Originality	32%	Low
Elaboration	34%	Low

Based on Table 4, of the 15 primary students, the average score of creative thinking skills on all indicators is low. In this case, the students did not develop their new ideas. Thus, they have difficulty working on the test problems given. Based on the results of calculations and analysis conducted by researchers, data was obtained as percentage data on the value of creative thinking primary students.

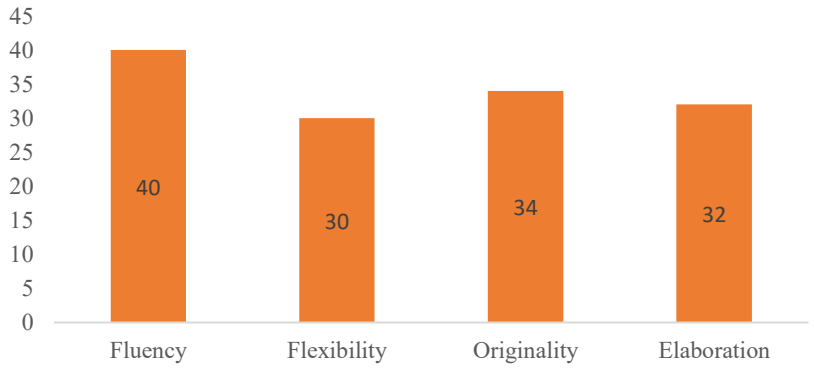

Figure 4. Percentage of Creative Thinking on Each Indicator

The fluency indicator has the highest percentage at 40%. These results show that students can explain ideas entirely and in detail. This aligns with Van Hooijdonk et al. (2023) opinion on the skill to think to produce many different ideas. The flexibility indicator has a percentage of 30%. This shows that students have not been able to provide varied solutions and find more than one answer to solve a problem. This is the opinion of Gafour & Gafour (2020), skills to adapt to change, and thinking outside standard patterns.

The originality indicator has a percentage of 34%. This indicator shows that students cannot answer and explain in their language. Students have difficulty developing new ideas and sentences to answer questions and still refer to friends' answers. In this, Van Hooijdonk et al. (2023), clarify that originality brings up unique ideas. The elaboration indicator has a percentage of 32%. In this indicator, students have difficulty in elaborating an idea. The way can recognize this skill students answer questions in detail (Shafa et al., 2023).

Creative Thinking Levels

Based on the percentage results obtained from 15 students selected as examples of students with the category of creative thinking, only 3 students from several schools. Findings from some student responses are as follows. The results of creative thinking are four stages at each level to determine the level of student thinking. These results are high, moderate, and low creative thinking. Presented the results of creative thinking at the student level.

High-Level of Creative Thinking

One student has the highest score out of 15 students. The following presents the student's fluency, flexibility, originality, and elaboration. Samples of students' written work at a high level are shown in Figure 5 to Figure 8.

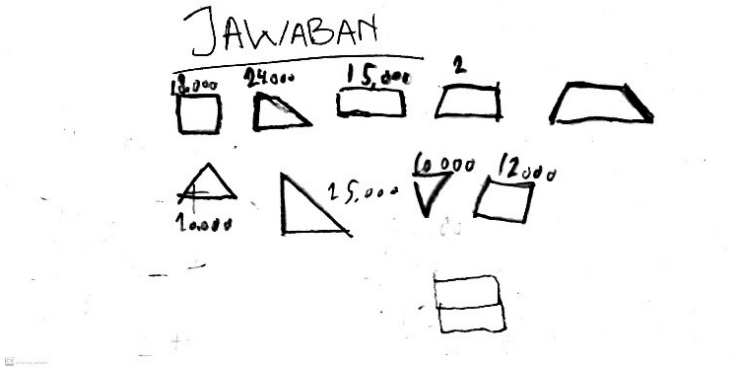

Figure 5. Sample of Fluency on High-Level

First, students identify problems by generating several ideas for solving a problem. Students can identify problems by using several ideas. The student draws the various shapes needed to form a design and adjusts the price. The shapes needed are a square, 2 different trapezoid shapes, 3 different triangles, a rectangle, and a rhombus.

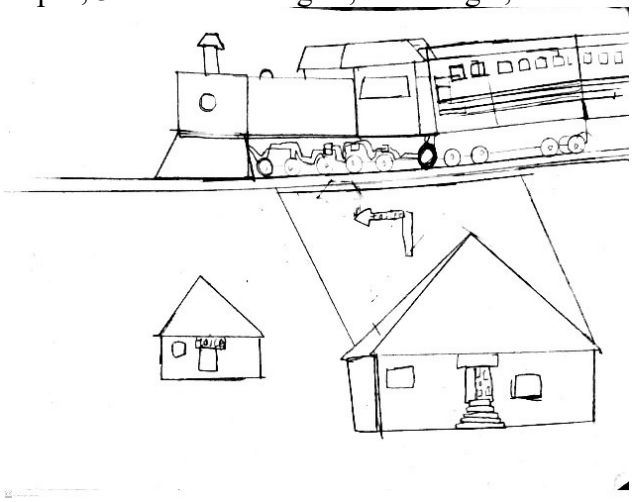

Figure 6. Sample of Flexibility on High-Level

Second, students began to combine the pieces of the chosen shape into a design. Students drew the design according to their imagination. Students drew a house with a railroad track behind it, and students drew a train that was passing by.

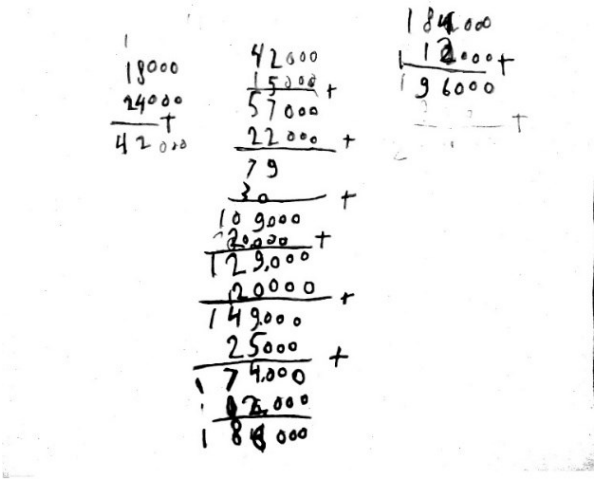

Figure 7. Sample of Originality on High-Level

Third, after combining the shapes into a design, students had a new idea to solve the problem using the long addition strategy. Out of 15 students, only this student used the long way of addition. Students added 2 numbers and then added them together. Then, students added the result again until it did not exceed the specified limit.

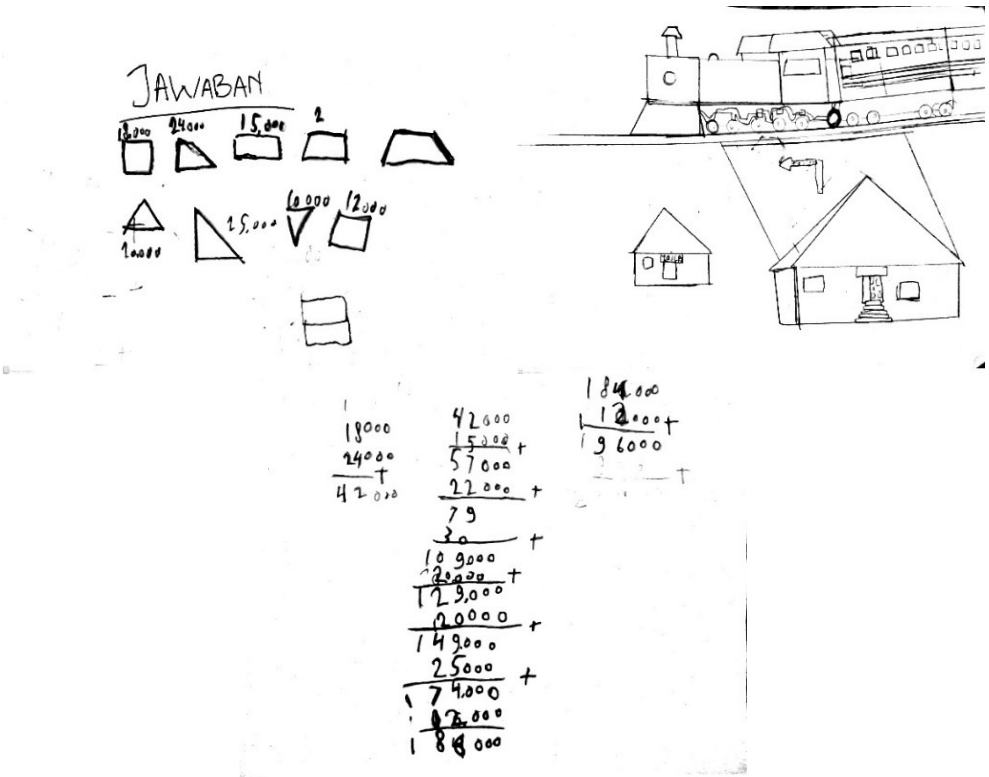

Figure 8. Sample of Elaboration on High-Level

Finally, students provide conclusions and add information or ideas from the answers made in detail and specifically. Students can also explain the work they do entirely and in detail. Students can conclude and explain by drawing some of the needed shapes, adjusting the price, and finally combining the shapes into a design. Interviews were conducted to support the findings of the students' test analysis.

R : Have you solved this problem before?
AR : Not yet
R : What made you not understand the question?
AR : At first, I did not understand the question, but when I read it, I immediately understood it.
R : How many solutions did you use to solve the problem?
AR : There is 1
R : When working, did you use your thoughts and not cheat?
AR : Yes, I used my thoughts and did not cheat.
R : Explain your answer to this question!
AR Determine the shape to be drawn, then think of a design and calculate the price.
R : Explain how you think to solve the problem in the problem.
AR : I imagine, then I come up with an idea and calculate the price.
R : What conclusions did you make that relate to the previous steps?
AR : I was able to learn about various shapes in space and learn addition. In addition, I also began to have a broader imagination to create a design.

The first was AR, an example of a student's creative thinking with a high score. As seen in the interview, AR could explain the answer thoroughly and clearly. However, AR still needs to develop new and original problem-solving methods.

Moderate-Level of Creative Thinking

Of the 15 students, one student has a moderate thinking category. The following is presented: fluency, flexibility, originality, and elaboration. Samples of students' written work at a moderate level are shown in Figure 9 to Figure 12.

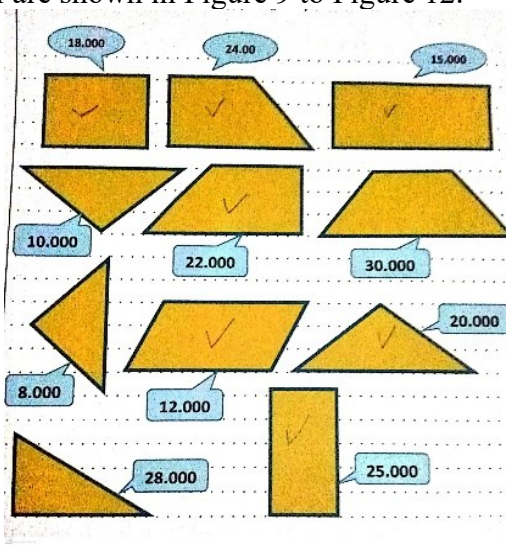

Figure 9. Sample of Fluency on Moderate-Level

First, students identify problems by generating several ideas for solving a problem. Students did not write on the answer sheet but ticked the shapes provided. The shapes include a square, 2 different trapezoids, 2 different rectangles, a parallelogram, and a triangle. The student chose the shapes by adjusting the price limit that had been set.

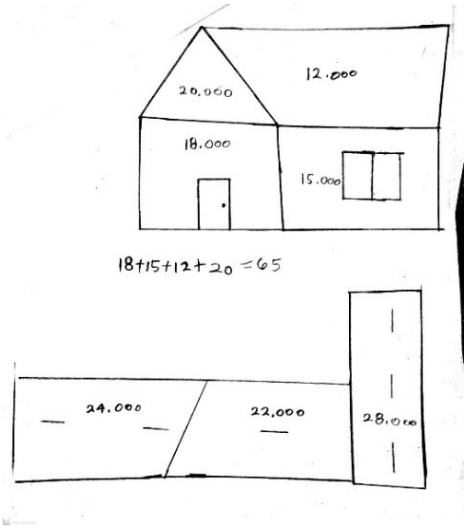

Figure 10. Sample of Flexibility on Moderate-Level

Second, students combined the pieces of the selected shape into a design. Because students are not good at imagining, they drew a design into several shapes. The shapes were a house and 2 rectangles put together. Because students adjusted their chosen shape, it was cut into 2 parts.

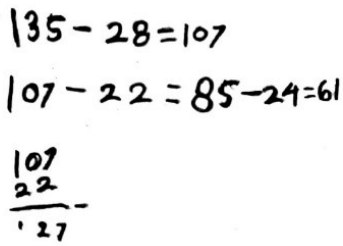

Figure 11. Sample of Originality on Moderate-Level

Third, students have the idea to solve the problem using the subtraction strategy. The picture above shows that students who are preparing subtraction strategies are good. However, the student has not been able to provide a new way to solve a problem. In the subtraction, there are 2 strategies, which are long and horizontal.

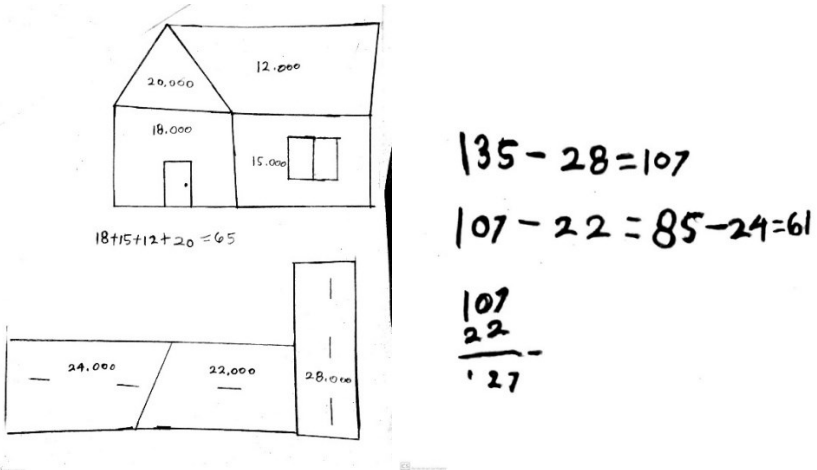

Figure 12. Sample of Elaboration on Moderate-Level

Finally, the student can conclude a small quantity of the answers students made. The student has been unable to provide additional information or ideas about the answers students made. Students only provide explanations when seeing their answers and without additional ideas. Students also tend to be more silent and think when explaining, but they still provide answers.

R : Have you solved this problem before?
DK : Not yet
R : What made you not understand the question?
DK : I do not understand the shape.
R : How many solutions did you use to solve the problem?
DK : There is 1
R : When working, did you use your thoughts and not cheat?
DK : Yes, I used my thoughts and did not cheat.
R : Explain your answer to this question!
DK : Draw first, then determine the price.
R : Explain how you think to solve the problem in the problem.
DK : I arranged the shapes first and then calculated the price.
R : What conclusions did you make that relate to the previous steps?
DK : I can learn subtraction and addition.

The interview was conducted to support the students' test analysis findings. The second is DK, an example of a student's creative thinking with a moderate score. As seen in the interview, DK needs to be able to explain answers clearly but incompletely. DK needs to develop new and original ways.

Low-Level of Creative Thinking

Of the 15 students in the low category, there is one example of a student with a low creative score. First, students should provide ideas on how to solve the problem and be able to explain the idea. However, the student did not have an idea of how to solve the test question and could not explain the idea that the student would use. Students chose the shape presented by the problem carelessly and did not adjust the design to be made because students were confused about what form of design the student would make. Samples of students' written work at a low level are shown in Figure 13 to Figure 15.

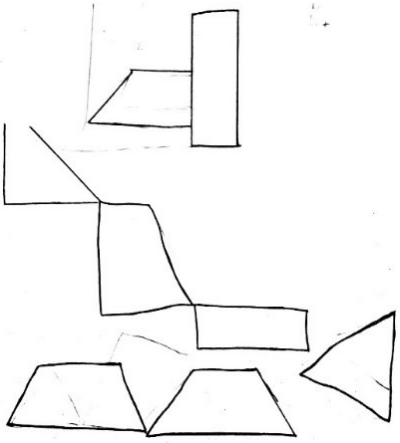

Figure 13. Sample of Flexibility on Low-Level

Second, students began to connect the pieces of shapes from the fluency step into a design shape. Because students are not very good at imagining, they draw shapes randomly and irregularly combine shapes.

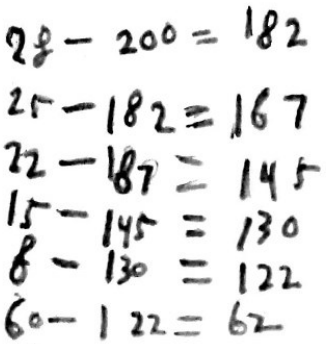

Figure 14. Sample of Originality on Low-Level

Third, students solved the problem by using a continuous subtraction strategy. The method used was correct, but the student reversed in putting the numbers, which should be small numbers, at the back. The small numbers were put in front so that the answers the students presented were all wrong.

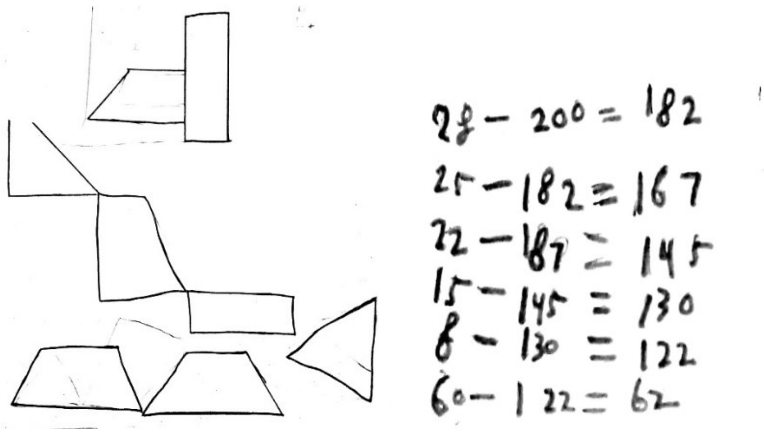

Figure 15. Sample of Elaboration on Low-Level

Finally, the students could not conclude the answers they made. The student also could not provide detailed information about the answers and ideas. So that students are in the low category. Judging from the form students made, it is clear that the student's creative thinking level is also low. Likewise, the calculations students made were all wrong. The interview was conducted to support the students' test analysis findings. The third is KF as an example of a creative thinking student with a low score.

R : Have you solved this problem before?
KF : Not yet
R : What made you not understand the question?
KF : Shape
R : How many solutions did you use to solve the problem?
KF : There is 1
R : When working, did you use your thoughts and not cheat?
KF : Yes, I used my thoughts and did not cheat.
R : Explain your answer to this question!
KF : Drawing first.

R : Explain how you think to solve the problem in the problem.
KF : I worked out the design first.
R : What conclusions did you make?
KF : I gained knowledge from this problem.

The interview showed that KF could not explain the answer clearly and thoroughly. These students need to develop new ways and learn to have the courage to convey an idea. On the other hand, the results of data analysis found high, medium, and low-level creative thinking categories. Students can generate and express the concepts and ideas in the high-level creative thinking fluency indicator. At the moderate level of creative thinking, students are less able to generate and explain the concept to be made. At the low level, students cannot come up with and explain the ideas used. This is because some students still have difficulty in understanding math concepts. Using their imagination, students can correctly calculate the total amount of money to be spent and then connect the shapes into a design at high levels of creative thinking, flexibility, and originality indicators. At the moderate level, students are less good at using their imagination, and the calculations are also wrong. After calculating the total amount of money to be spent, connect the shapes into a design with intersecting shapes. At the low level, students cannot use their imagination at all. The calculations were also all wrong. After calculating and then connecting all the shapes chosen carelessly, the shape of the design is careless. This is due to the lack of students who are creative in thinking. In the last indicator, namely elaboration creative thinking, high-level students can explain answers and ideas correctly and in detail. Students cannot explain answers and ideas correctly and in detail at a moderate level. At a low level, students cannot explain answers and ideas correctly and in detail.

The study's first finding is that primary students have a low level in all creative thinking components in terms of fluency, flexibility, originality, and elaboration, with the highest to lowest scores being fluency, originality, elaboration, and flexibility. This finding is in line with several previous studies (Fatmawati et al., 2022; Kurniati & Mariani, 2020; Lestari, 2022; Malik, 2025; Syafri, 2023), where fluency is the highest component compared to flexibility, originality, and elaboration. Hidayah et al. (2021) and Wahyuni & Palupi (2022) also confirmed that primary students often experience creative thinking difficulties, especially flexibility and elaboration when solving open-ended math problems. However, several studies have found that students can show higher creativity in solving math problems than the results of this study (Maulidia et al., 2019; Sulastri et al., 2024). This difference is likely due to the learning factors applied, where the conflicting study uses a more contextualized problem-solving or mathematical literacy-based approach (Fitrianawati et al., 2020; Prihastari et al., 2022).

The study's second finding categorizes students into high, moderate, and low creative thinking types. Our results indicate that high and moderate creative thinking students tend to excel in flexibility and originality. In contrast, those in the low group show greater strength in fluency and elaboration. This is in line with Handayani et al. (2021) and (Fatmawati et al., 2022), who found that students with high creativity are more capable of generating unique and diverse ideas to solve problems. Purwati & Alberida (2022) also emphasized that students with higher creative thinking skills demonstrate greater flexibility in generating alternative solutions, unlike those with lower creativity who rely mainly on fluency. However, these findings contrast with Pradiarti et al. (2024) and Sulastri et al. (2024), who argued that flexibility and originality are harder for primary students due to their reliance on structured and less explorative thinking patterns.

Moreover, Fitrianawati et al. (2020) highlighted that numeracy literacy contributes more to fluency and elaboration than flexibility and originality, explaining why students with lower creative thinking levels in our study were more dominant in these two aspects. This difference may be due to the different learning contexts and methods used, where exploration-based approaches stimulate flexibility and originality, while structure-based learning supports fluency and elaboration (Annisah et al., 2022; Santoso et al., 2023).

Many factors cause students' creative thinking skills to be in the low category (Alfitriyani et al., 2021). The low level of creative thinking skills is most likely due to the lack of understanding of teachers to integrate into teaching and learning activities. To train students to develop ideas and influence students to think openly, teachers need to integrate creative thinking into the teaching and learning process (Muslihasari et al., 2024). Teachers are tasked with developing students' creative thinking skills (Asrul, 2018). Based on a study by Alfitriyani et al. (2021), the cause of low creative thinking among students when answering questions is that they are not careful when reading the questions, so students give ideas or answers irrelevant to solving common problems. This happens because students are unfamiliar with creative thinking skills questions (Purwati & Alberida, 2022). It can be seen from the interview that students still do not understand the questions given. Students seem to focus more on a form without reading and understanding the question. In the tests, students have difficulty expressing concepts, using principles, and solving mathematical literacy problems (Meika et al., 2021).

Creative thinking skills, including mathematical literacy, can be developed through problems (Muslihasari et al., 2024). Based on Utami & Amir (2023), students' problem-solving levels will be better if the presented problems describe experiences in the real world. Mathematical literacy questions require reasoning skills and solve problems that emphasize various problems and situations in everyday life (Purwanti et al., 2020). Based on the problems presented by researchers, only a few students can understand the problems. This shows that students do not use reasoning, knowledge, or experience. Because the problems presented early can be passed on to students based on their reasoning, knowledge, and experience in life, this opinion is in line with Pradiarti et al. (2024), mathematical literacy problems are one way of improving students' creative thinking. They can train students to see a problem from a different perspective and connect it with the knowledge to produce varied solutions to open mathematics problems.

CONCLUSION

Based on the study results and discussion, it can be concluded that primary students have a low level of creative thinking in all components of creative thinking, namely fluency, flexibility, originality, and elaboration. The order of creative thinking components from highest to lowest are fluency, originality, elaboration, and flexibility. In addition, grouping students based on their creativity level shows that students with high and moderate creativity levels are more dominant in flexibility and originality. Meanwhile, students with low creativity levels are more dominant in fluency and elaboration. The findings of this study provide practical implications, and it is recommended that teachers elaborate more on the aspects of fluency, flexibility, originality, and elaboration so that the creative thinking of primary students can increase. In this case, in particular, learning is devoted to flexibility and originality so that students can reach high levels of creative thinking. On the other hand, further study is recommended to explore the factors influencing students' creativity level, such as mathematical literacy skills' components in formulating, employing, and interpreting.

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