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Creative Thinking Process of Prospective Teacher Students Based on Cognitive Style in Solving Contextual Problems

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Abstract

This study aims to explore the creative thinking processes of prospective elementary school teacher students in solving contextual mathematical problems based on their cognitive styles. Using a qualitative descriptive approach, two students were selected through purposive sampling: one with a field independent (FI) cognitive style and high self-efficacy, and the other with a field dependent (FD) cognitive style and low self-efficacy. Data were collected through task-based tests and in-depth interviews, then validated and analyzed based on the stages of creative thinking: synthesizing ideas, building ideas, planning the implementation of ideas, and implementing the ideas. The results revealed notable differences in the creative thinking processes of the two subjects. The FI student exhibited fluency, flexibility, and novelty by generating multiple correct solutions through diverse strategies. In contrast, the FD student faced challenges in synthesizing ideas, relying on a single strategy, and producing only one correct solution. These findings highlight the significant impact of cognitive style on creative mathematical thinking and underscore the importance of tailored instructional approaches to support diverse cognitive profiles.

Keywords: Creative thinking, process, cognitive style, teacher, contextual problems

Abstrak

Penelitian ini bertujuan untuk mengeksplorasi proses berpikir kreatif calon guru sekolah dasar dalam memecahkan masalah matematika kontekstual berdasarkan gaya kognitif mereka. Dengan menggunakan pendekatan deskriptif kualitatif, dua siswa dipilih melalui pengambilan sampel secara sengaja: satu dengan gaya kognitif field independent (FI) dan efikasi diri yang tinggi, dan yang lainnya dengan gaya kognitif field dependent (FD) dan efikasi diri yang rendah. Data dikumpulkan melalui tes berbasis tugas dan wawancara mendalam, kemudian divalidasi dan dianalisis berdasarkan tahapan berpikir kreatif: mensintesis ide, membangun ide, merencanakan implementasi ide, dan mengimplementasikan ide. Hasilnya mengungkapkan perbedaan yang mencolok dalam proses berpikir kreatif kedua subjek. Siswa FI menunjukkan kelancaran, fleksibilitas, dan kebaruan dengan menghasilkan beberapa solusi yang benar melalui berbagai strategi. Sebaliknya, siswa FD menghadapi tantangan dalam mensintesis ide, mengandalkan satu strategi, dan hanya menghasilkan satu solusi yang benar. Temuan ini menyoroti dampak signifikan gaya kognitif pada pemikiran matematika kreatif dan menggarisbawahi pentingnya pendekatan instruksional yang disesuaikan untuk mendukung profil kognitif yang beragam.

Kata kunci: Berpikir kreatif, proses, gaya kognitif, guru, masalah kontekstual

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Introduction

The creative thinking process involves cognitive and behavioral operations that allow individuals to generate new ideas and solutions (Chavula et al., 2022). Information seeking is a key part of this process. Wallas (1926) defined creative thinking as consisting of four stages: preparation, incubation, illumination, and insight. Morgan (1993) modified this model into three stages: preparation, incubation and illumination, and verification. While Morgan maintained that the stages were consistent with

Wallas' theory, he combined incubation and illumination into a single stage. Similarly, Krulik and Rudnick (1995) described the stages of creative thinking as synthesizing, building, and applying ideas. Siswono (2022) further expanded the process, identifying the stages of synthesizing, building, planning, and applying ideas to produce novel outcomes when solving problems.

Problem-solving stimulates the brain to engage in creative thinking and creative thinking is essential for solving mathematical problems (Siswono et al, 2017). In schools, it is important for teachers to present problem-solving exercises that improve students' creative thinking skills. One effective approach is the use of contextual mathematical problems, which connect real-life situations to mathematical concepts, enhancing students' understanding (Pratiwi & Widjajayanti, 2020). However, many students struggle with translating real-world problems into mathematical concepts (Sepeng & Madzorera, 2014). This challenge is evident in prospective elementary school teachers, who often find it difficult to link mathematical concepts to contextual problems, particularly in topics like fractions.

Fractions are a critical mathematical concept, both in everyday life and in the broader mathematics curriculum (Both & Newton, 2012). Understanding fractions is necessary for practical tasks, such as carpentry, pharmacy, and mechanics and provides a foundation for higher-level mathematics. However, students often make errors in solving fraction problems, which include reading, comprehension, transformation, process skills, and encoding errors. Gender differences also play a role, as female students often struggle with the concept of fractions, while males tend to make errors in problem-solving precision (Aminah & Kurniawati, 2018).

Cognitive style, which refers to how individuals process and respond to information, influences students' problem-solving strategies. Witkin (1977) identified two cognitive styles: field independent (FI) and field dependent (FD). FI students are more analytical, able to separate elements and context, while FD students process information more globally and rely on intuition. FI students tend to be more creative in problem-solving than FD students. Studies have shown that FI students perform better in creative thinking tasks, including solving mathematical problems, compared to FD students (Azlina, Amin & Lukito, 2017).

This study explores the creative thinking processes of prospective elementary school teachers, focusing on the influence of cognitive style and self-efficacy in solving contextual mathematical problems, particularly fractions. Unlike previous studies that focus separately on cognitive style or self-efficacy, this research examines both factors in a holistic context. The study emphasizes the conceptual challenges prospective teachers face in understanding fractions and underscores the importance of contextual learning in teacher education. The findings aim to contribute to the development of instructional models that cater to different cognitive styles and self-efficacy levels, promoting creative thinking and effective problem-solving in mathematics education.

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Method

The research method used in this study is a qualitative method. Qualitative research is designed to explore and understand the meanings individuals or groups ascribe to social problems, behaviors, concepts, or phenomena (Creswell, 2014). It is particularly useful for investigating community life, history, social issues, and human behavior. This study specifically utilizes a case study approach, which allows for an in-depth exploration of a particular case, gathering comprehensive data through various procedures over a set period.

Purposive sampling, a non-probability sampling technique, was used to select the study subjects based on specific criteria relevant to the research objectives (Sugiyono, 2008). Two subjects were chosen based on their cognitive style assessments using the Group Embedded Figures Test (GEFT), which classifies participants into field independent (FI) and field dependent (FD) cognitive styles. One subject was selected from each cognitive style category. Selection criteria included GEFT scores, the ability to clearly articulate ideas, consistency in solving mathematical problems, and willingness to participate. Data were gathered using a task-based mathematical problem-solving test, followed by semi-structured interviews to explore the subjects' creative thinking processes in solving contextual problems involving fractions.

The secondary instruments used in this study included the GEFT, contextual problem-solving test questions, and interview guidelines. To ensure the reliability and validity of the findings, time triangulation was employed. This involved collecting both written data (from completing contextual mathematical problem-solving tasks) and verbal data (from the subjects' expressions about their problem-solving processes) at different times. This triangulation helped confirm consistency across the data. Data analysis was descriptive, focusing on presenting the data comprehensively and interpreting it by integrating relevant concepts connected to the research.

Result and Discussion

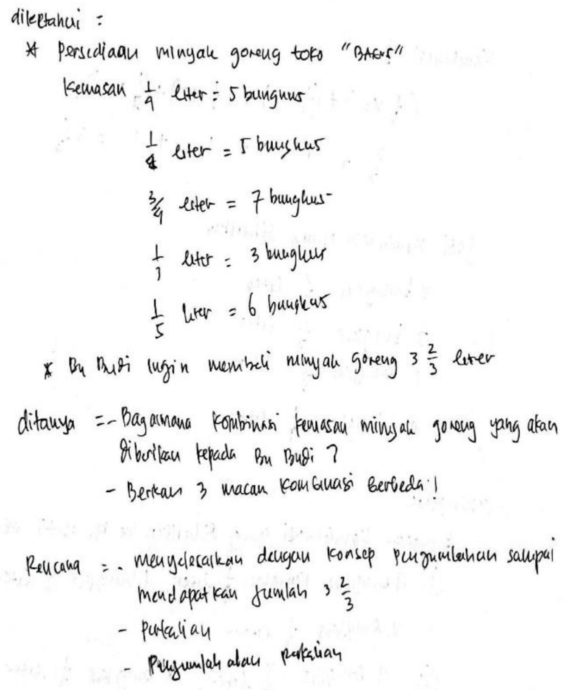
Based on the test results, the research subjects were selected as follows: one student with a field independent cognitive style and high self-efficacy, and one student with a field independent cognitive style and low self-efficacy. To minimize bias, the selected subjects were matched in terms of gender and relatively similar mathematical abilities. This approach ensured that the study results were not influenced by these two factors. Table 1 below presents the characteristics of the selected research subjects.

Table 1. Characteristics of Selected Research Subjects

No	Subject Name	Gender	GPA	Cognitive Style	Subject Code
1	DA	Male	3,93	*Field Independent*	FI
2	VAF	Male	3,91	*Field Dependent*	FD

Exposure, Validation, and Analysis of Data on the Creative Thinking Process of the FI Subject in Solving Contextual Problems.

The validation of the creative thinking process data for the FI subject in solving TMK-1 and TMK-2 questions reveals a relatively consistent structure and content. This consistency indicates that the FI data is valid. The validation confirms that the FI data from solving TMK-1 is credible, making it suitable for analysis to describe the creative thinking process of prospective teacher students with a field-independent cognitive style. Based on the data presentation and validation results, it can be concluded that the creative thinking process of FI subjects in solving contextual problems is as follows:



Translation:

Given:

The stock of cooking oil at the store "Sinar":

Packaging:

- ¼ liter: 5 packs
- ½ liter: 7 packs
- ¾ liter: 7 packs
- 1 liter: 3 packs
- 1⅕ liter: 6 packs

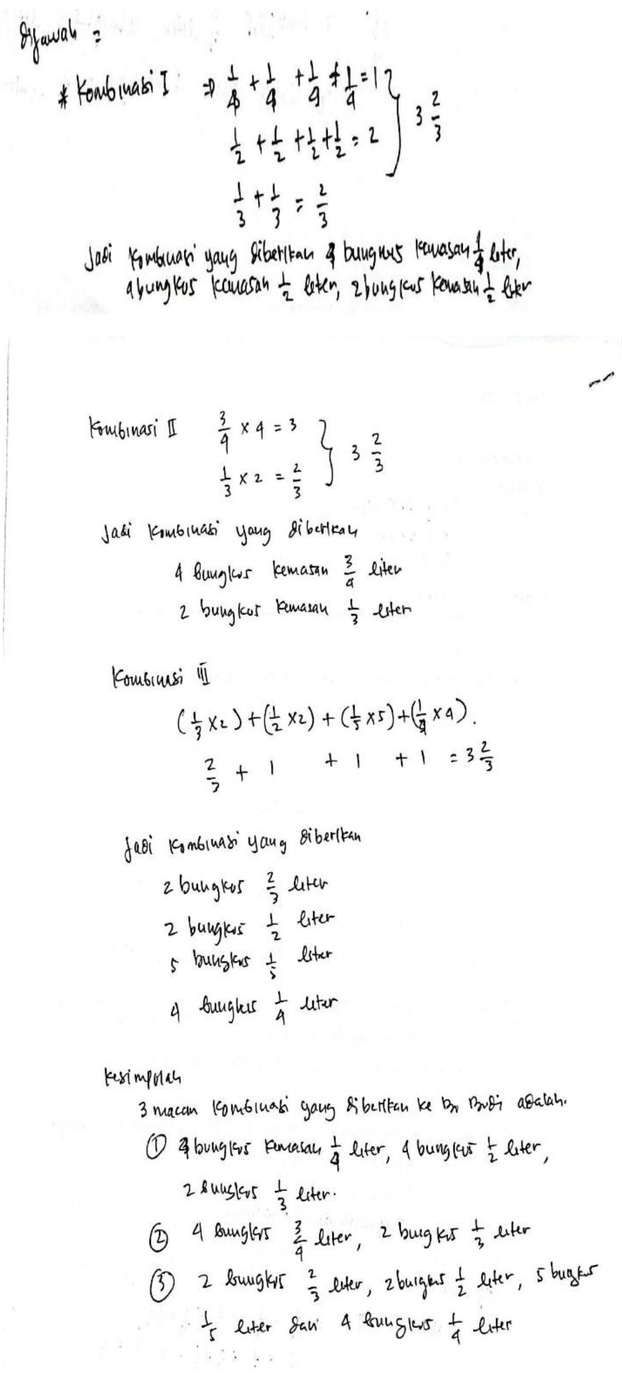
Mrs. Dupi wants to buy 3⅗ liters of cooking oil

Question:

- What combination of cooking oil packages will be given to Mrs. Dupi?
- Use 3 different types of packaging!

Plan:

- Solve using the concept of addition until reaching a total of 3⅗ liters
- Show the solution
- The answer must be appropriate


Dijawab :
* Kombinasi I ⇒ $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=1$
$\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=2$ } $3\frac{2}{3}$
$\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$
Jadi kombinasi yang diberikan 4 bungkus kemasan $\frac{1}{4}$ liter, 4 bungkus kemasan $\frac{1}{2}$ liter, 2 bungkus kemasan $\frac{1}{2}$ liter
Kombinasi II $\frac{3}{4}\times 4=3$
$\frac{1}{3}\times 2=\frac{2}{3}$ } $3\frac{2}{3}$
Jadi kombinasi yang diberikan
4 bungkus kemasan $\frac{3}{4}$ liter
2 bungkus kemasan $\frac{1}{3}$ liter
Kombinasi III
$(\frac{1}{3}\times 2)+(\frac{1}{2}\times 2)+(\frac{1}{5}\times 5)+(\frac{1}{4}\times 4)$.
$\frac{2}{3}+1+1+1=3\frac{2}{3}$
Jadi kombinasi yang diberikan
2 bungkus $\frac{2}{3}$ liter
2 bungkus $\frac{1}{2}$ liter
5 bungkus $\frac{1}{5}$ liter
4 bungkus $\frac{1}{4}$ liter
Kesimpulan
3 macam kombinasi yang diberikan ke Bu Budi adalah.
① 4 bungkus kemasan $\frac{1}{4}$ liter, 4 bungkus $\frac{1}{2}$ liter, 2 bungkus $\frac{1}{3}$ liter.
② 4 bungkus $\frac{3}{4}$ liter, 2 bungkus $\frac{1}{3}$ liter
③ 2 bungkus $\frac{2}{3}$ liter, 2 bungkus $\frac{1}{2}$ liter, 5 bungkus $\frac{1}{5}$ liter dan 4 bungkus $\frac{1}{4}$ liter

Translation:
Answer:

Combination I:

- $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=1$
- $\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=2$
- $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$

Total = 3 $\frac{2}{3}$

Thus, the combination includes 4 packages of 1/4 liter, 4 packages of 1/2 liter, and 3 packages of 1/3 liter.

Combination II

$\frac{3}{4}\times 4=3$ and $\frac{1}{2}\times 2=\frac{2}{2}=1\Rightarrow 3+\frac{2}{3}=3\frac{2}{3}$

So, the combination given is:

- 4 packs of ¾ liter
- 2 packs of ½ liter

Combination III

$(\frac{2}{3}\times 2)+(\frac{1}{2}\times 2)+(\frac{1}{4}\times 5)+(\frac{1}{4}\times 4)=\frac{4}{3}+1+\frac{5}{4}+1=3\frac{2}{3}$

So, the combination given is:

- 2 packs of ⅔ liter
- 2 packs of ½ liter
- 5 packs of ¼ liter
- 4 packs of ¼ liter

Conclusion

The 3 types of combinations given to Mrs. Dupi are:

1. **3 packs of 1 liter, 4 packs of ½ liter, 2 packs of ⅓ liter**
2. **4 packs of ¾ liter, 2 packs of ½ liter**
3. **2 packs of ⅔ liter, 2 packs of ½ liter, 5 packs of ¼ liter**, and **4 packs of ¼ liter**

Figure 1. Subject FI's Answer Results in Solving TMK1 Problems

1. Synthesizing Ideas

The FI subject in synthesizing ideas begins by understanding the information needed to solve the given contextual problem. The subject reads the question silently, the subject confidently explains in detail and correctly the information known from namely: Toko Bagus has a stock of cooking oil in $\frac{1}{4}$ liter packaging 5 packs, $\frac{1}{2}$ liter packaging 5 packs, $\frac{3}{4}$ liter packaging 7 packs, $\frac{1}{3}$ liter packaging 3 packs and $\frac{1}{5}$ liter packaging 6 packs. The subject shows a high curiosity by adding information known in the question is that Mrs. Budi wants to buy $3\frac{2}{3}$ liters of cooking oil. In addition, the subject confidently tells about the information asked in the question that she was asked to make 3 different combinations of cooking oil packaging that the "BAGUS" store will give to Mrs. Budi. A good understanding of the problem information given by the subject can link the contextual problem to the mathematical concept, namely the concept of fractions.

2. Building Ideas.

The FI subject in building ideas in generating ideas related to the contextual problem given from the results of the previous idea synthesis. The subject uses addition operations to solve the given contextual problem. The FI subject develops a strategy in solving the given contextual problem by adding up the various types of cooking oil packaging available to find a combination of $3\frac{2}{3}$ liters of cooking oil. The FI subject provides more than one idea, namely the subject tries to add an explanation that in linking known information to solve the given contextual problem, the subject explains the next plan will solve it by using the addition and multiplication method and further the subject will use multiplication and division operations. The FI subject can mention a solution plan of more than 1 (one) idea/strategy, meaning that the FI subject in building ideas to solve contextual problems can meet the criteria of fluency.

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3. Planning the Implementation of Ideas.

The FI subject looks confident in explaining the solution plan, the subject in planning the implementation of his ideas by using the addition operation. The FI subject will clearly and without hesitation start implementing his idea by adding up the packaging sizes $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=1$, then adding the results of the addition of cooking oil packaging $\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=2$, and adding $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$. The addition is done until the subject finds the first combination of cooking oil packaging that suits the needs that Mrs. Budi will buy. Furthermore, the subject explains the second way of implementing his idea in solving contextual problems by using multiplication operations, the subject takes the largest cooking oil packaging size $\frac{3}{4}$ multiplied by 4 so that it meets 3 (three) liters, then then adds the cooking oil packaging size $\frac{1}{3}$ liter multiplied by 2 to meet $\frac{2}{3}$. finally from this second packaging combination, it is found according to the cooking oil needs that Mrs. Budi will buy. Next, the FI-HSE subject tells the next idea implementation plan by multiplying and adding, the subject tries to multiply the size of the cooking oil packaging $\frac{1}{3}x2$ get $\frac{2}{3}$liters, then the cooking oil packaging $\frac{1}{2}x2$ get 1 liter, the cooking oil packaging $\frac{1}{5}x5$ to get 1 liter and the packaging $\frac{1}{4}x4$ to get 1 liter so that the total result is $3\frac{2}{2}$ liters.
The FI subject explains the implementation of his idea in detail and in detail, then provides 3 different ways and results in planning the implementation of his idea, meaning that the FI subject in implementing the idea can provide a variety of correct implementation plans and answers so that it can be said to meet the criteria for flexible creative thinking aspects.

4. Implementation of ideas

Stages of implementing ideas, the FI-HSE subject writes down the implementation of the idea according to the plan for implementing the idea and then explains that finding a solution in the first way is the first combination of 4 packs of $\frac{1}{4}$liter packaging, 4 packs of $\frac{1}{2}$liter packaging and 2 packs of $\frac{1}{3}$ liter packaging. The subject produced the combination by adding the packaging sizes $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=1$, then adding the results of the addition of cooking oil packaging $\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=2$, and adding $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$. so that the correct answer was the combination of cooking oil packaging sizes according to Mrs. Budi's needs of 3 $\frac{2}{3}$ liters.

The following describes the products produced by prospective teacher students with a field independent cognitive style in solving contextual mathematical problems, namely:

1. **Fluency aspect**

Subject FI in building ideas, shows fluency criteria, which are shown by the subject being able to formulate a plan for solving problems given more than one idea and correctly. Subject FI explains the solution plan with various ideas or methods. Subject FI can apply the idea plan or method used by producing the correct answer. This is indicated by the answer of subject FI being able to find the correct solution or answer from the first step or method taken by the subject in solving the TMK-1 problem. From the first method, a solution is produced by the subject adding several types, first starting from the $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=1$ package, then the $\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=2$ package and the $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$ package. With this first combination, subject FI fluently applies the addition operation of the fraction concept so as to find the results according to Mrs. Budi's cooking oil purchase request of 3 $\frac{2}{3}$liters.

2. **Flexibility**

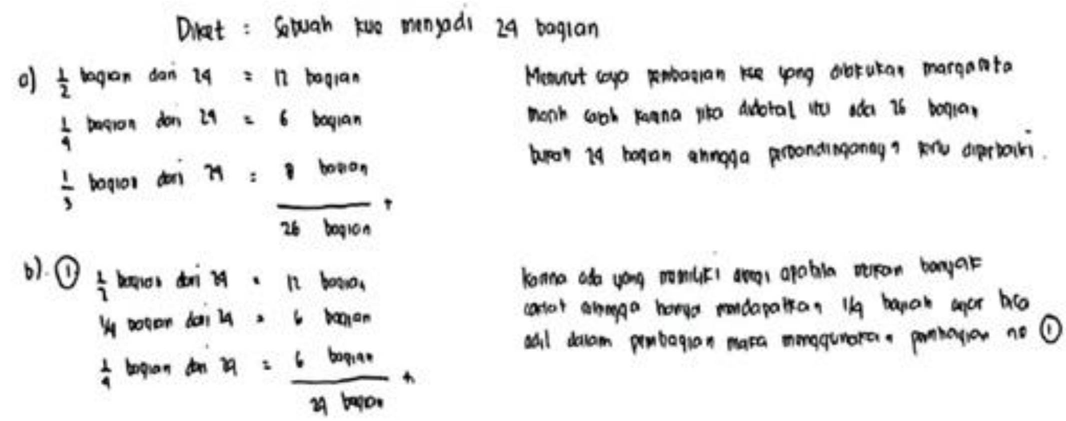
In the flexible aspect, FI subjects can solve contextual mathematical problems by thinking broadly and analytically in formulating plans for implementing ideas and successfully applying different ideas in producing solutions, can see a problem from a different perspective by looking for various alternative solutions and are able to change strategies. This means that FI subjects solve existing problems from TMK-1 questions by meeting flexible criteria.

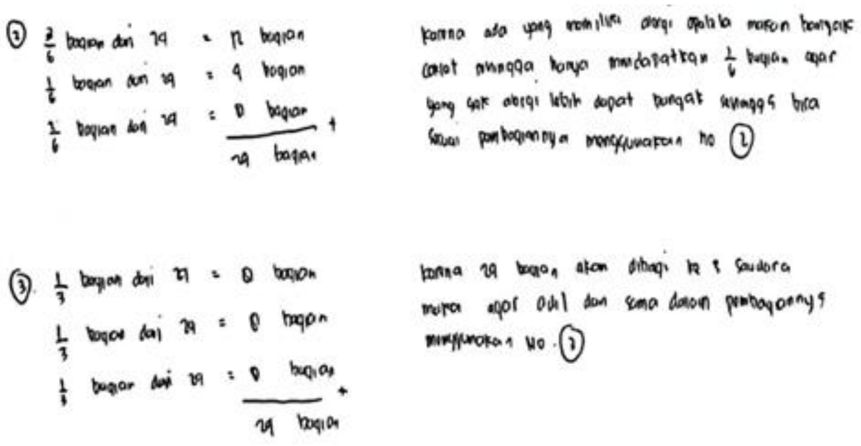
3. **Novelty**

The novelty aspect is seen based on the ability of FI subjects to find different answers than before and have a correct value or one answer that is not usually done. FI subjects in solving problems on TMK-1 that were given managed to find 3 (three) different answer combinations in different ways with correct results according to the initial problem given.

Exposure, Validation and Analysis of Data on the Creative Thinking Process of FD Subjects in Completing Contextual Problem Solving Tests.

The creative thinking process of prospective teacher students, subjects of Field Dependent (FD) cognitive style. in completing contextual problem solving tests TMK-1 and TMK 2. The results of interviews and observations of FD subjects, after being given TMK-1 and TMK 2 questions, the subjects read them carefully and in detail first, and were seen repeating them after finishing reading the TMK questions. Based on the indicators of the stages of the creative thinking process that have been made, it can be concluded that the creative thinking process of FD subjects in solving contextual problems is as follows:





Translation

Context: A cake is divided into 24 parts

a) ½ of 24 = 12 parts
¼ of 24 = 6 parts
⅓ of 24 = 8 parts
Total: 26 parts

According to the obtained portion sizes, it seems that the size of the cake has been assumed to be 24 parts. From these 24 parts, the respective fractions were taken.

b) ½ of 12 = 6 parts
¼ of 12 = 3 parts
⅓ of 12 = 4 parts
Total: 13 parts

Because there are multiple units, if the total number of cake pieces is 12, then it seems like the original whole cake was divided into 12 equal parts, and each part is taken accordingly.

Section 2:

- $\frac{2}{6}$ of 24 = 12 parts
- $\frac{1}{6}$ of 24 = 4 parts
- $\frac{2}{6}$ of 24 = 8 parts
- Total = 24 parts

Explanation: Some individuals have allergies when consuming large amounts of chocolate, so they receive $\frac{2}{6}$ of the portion. This ensures those without allergies can receive more, allowing for a fair distribution for problem number 2.

Section 3:

- $\frac{1}{3}$ of 24 = 8 parts
- $\frac{1}{3}$ of 24 = 8 parts
- $\frac{1}{3}$ of 24 = 8 parts
- Total = 24 parts

Explanation: Since 24 parts are to be divided among three siblings, the distribution must be equal and fair, ensuring each receives a proportional share for problem number 3.

***Figure 2** Subject FD's Answer Results in Solving TMK1 Problems*

1. Synthesizing Ideas

In synthesizing ideas, FD subjects read old questions and repeat them again before answering the researcher's questions. FD subjects tend to be quiet and explain what they know in TMK questions quite briefly (S1). The subject explains the information they know, briefly when asked by the researcher about other information. FD subjects in understanding what is asked in TMK (S2). FD subjects in understanding the information known and asked and relating the information to the subject's experience and knowledge (S3) seem to need a fairly long thinking process, the subject looks quiet and then answers the researcher's questions.

FD subjects in synthesizing ideas seem quiet and think for a long time before mentioning what is known from the TMK problem (S1) and in explaining what is asked briefly and a little hesitantly (S2) FD subjects need a long time to explain the relationship between information from TMK questions and the experience and knowledge possessed by the subject (S3).

2. Building Ideas

The creative thinking process of the FD subject's idea-building stage in solving contextual problems is seen from the indicators (G1) compiling a solution plan by linking existing information and knowledge and (G2) generating other ideas in solving the given problem. The FD subject's creative thinking process in building ideas seems to take a long time, the subject tends to be silent and rereads the TMK2 questions. The subject can only think of one idea and then wants to try to solve it directly on the answer sheet. The subject in compiling the solution plan is global (G1). The FD subject tends to be silent and takes a long time to answer the researcher's questions when interviewed about the TMK questions given. The subject only gives one idea and has no other way to solve the TMK problem (G2).

3. Planning the Implementation of Ideas

The FD subject in implementing the implementation of ideas cannot explain in detail, the subject seems to want to finish immediately by working on it on the answer sheet (P1). The FD-LSE subject in planning ideas cannot explain in detail, the subject wants to work on it immediately in order to quickly get the results of solving the TMK questions. The subject also experienced confusion when asked to think of another way (P2).

4. Implementation of Ideas

The FD subject in implementing the idea got 3 different answers but there were 2 wrong answers (A1). The FD subject could find another answer using the same method. The FD subject did not check and ensure the conclusion of the answer answered the given question (A2), because the subject felt that what was done was enough.

The following explains the products produced by student teacher subjects with a field Dependent cognitive style in solving contextual mathematical problems, namely:

1. Fluency

FD-LSE subjects can understand what information is asked, known and the relationship of the problem from the TMK given. The subject is only able to make one plan and. The subject can find 1 correct solution from 3 different answers to the existing problem from the TMK. This means that the subject meets the fluent criteria.

2. Flexibility

The flexible aspect or flexibility, FD-LSE subjects can solve contextual mathematical problems, FD-LSE subjects find 3 different answers in one way only. The subject cannot explain the strategy used in detail. This means that FD-LSE subjects have not been able to meet the flexible criteria.

3. Novelty Aspect

The novelty aspect is seen based on the ability of prospective teacher students to produce 3 different answers but only 1 (one) is correct. So it can be concluded that FD-LSE subjects have not been able to meet the novelty criteria.

The findings of this study reveal significant differences in the creative thinking processes of prospective teacher students with field independent (FI) and field dependent (FD) cognitive styles in solving contextual mathematical problems. These differences are evident across all stages of creative thinking: synthesizing ideas, building ideas, planning the implementation of ideas, and implementing ideas. Students with a field independent cognitive style demonstrate a more structured and flexible approach to problem solving. FI subjects exhibit high levels of fluency by generating multiple ideas and strategies that are both correct and relevant to the given problem. They are able to synthesize information quickly and accurately, link it to prior knowledge, and explore multiple solution paths. This aligns with the characteristics of field independent learners who tend to be self-directed, analytical, and better at working with abstract concepts (Witkin et al., 1977). Moreover, the FI subject in this study showed flexibility by changing strategies and providing three different, yet correct, combinations to solve the problem. The novelty aspect was also fulfilled, as the subject was able to construct original solutions that deviated from common patterns while still being correct.

On the other hand, field dependent students showed more limited creative thinking. The FD subject needed more time to process and understand information and tended to rely on external cues, which is consistent with the general profile of field dependent learners who often require structured guidance and are more socially oriented (Suprapti et al, 2024). The FD subject showed lower fluency and flexibility, generating only a single strategy and struggling to explain or justify their approach. Although three different answers were provided, only one was correct, indicating that the novelty criterion was also unmet. This reflects a surface-level engagement with the problem without sufficient depth or exploration of alternative strategies. These findings support the assertion that cognitive style plays a critical role in shaping how students process information and approach creative problem solving (Riding & Rayner, 1998). Furthermore, the results highlight the importance of considering individual cognitive differences in teacher education, particularly when training prospective teachers to design and solve contextual mathematical problems. Developing tailored pedagogical approaches that foster creative thinking in both FI and FD learners is essential.

Conclusion

In conclusion, this study found that prospective elementary school teacher students with a field independent (FI) cognitive style and high self-efficacy demonstrated a complete and structured creative thinking process. They were able to synthesize ideas by thoroughly understanding and connecting contextual mathematical problems with prior mathematical concepts. At the stage of building and planning ideas, they generated multiple strategies, implemented their ideas confidently, and produced several correct solutions. This indicates that FI students fulfill all three creative thinking aspects: fluency, flexibility, and novelty. In contrast, students with a field dependent (FD) cognitive style and low self-efficacy exhibited limitations in synthesizing and building ideas. They tended to provide minimal explanation, generated only one solution plan, and although they produced several answers, only one was correct. These students met the fluency aspect but did not achieve the flexibility and novelty criteria. The impact of this research highlights the importance of recognizing individual cognitive styles in mathematics education. Understanding that FI students tend to perform better in creative mathematical problem-solving suggests that targeted pedagogical support is needed, especially for FD students. Educators should consider designing learning environments and scaffolding techniques that help FD students develop deeper conceptual understanding, enhance their confidence (self-efficacy), and foster diverse solution strategies. This research contributes to the field by offering empirical evidence on how cognitive style influences creative thinking, and can inform differentiated instruction practices to support diverse learners in developing their creative mathematical thinking skills.

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