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Students' Critical Thinking Dispositions in View of Cognitive Styles: Exhibiting Confidence in Reasoning and Inquisitive

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ABSTRACT

The problem and the aim of the study. The underlying issue of this study is that although critical thinking skills are widely recognized as important in education, understanding how students demonstrate critical thinking dispositions such as confidence in reasoning and inquisitiveness based on their cognitive styles remains limited. Students with different cognitive styles, such as field-independent (FI) and field-dependent (FD), tend to exhibit varying levels of critical thinking abilities when faced with complex problems, particularly in the context of mathematical problem-solving.The purpose of this study is to describe students' critical thinking dispositions in the aspects of Confidence in Reasoning and Inquisitive in terms of cognitive style.

The underlying problem of this study is that although the importance of critical thinking skills is widely recognized in education, how students demonstrate critical thinking dispositions such as confidence in reasoning and inquisitiveness based on their cognitive styles remains poorly understood. Students with different cognitive styles, such as field-independent (FI) and field-dependent (FD), may exhibit varying levels of critical thinking abilities when faced with complex problems, particularly in the context of mathematical problem-solving. This study aims to explore how students with different cognitive styles exhibit their critical thinking dispositions, specifically in terms of confidence in reasoning and inquisitiveness, to provide deeper insights into the role of cognitive styles in fostering critical thinking skills among students.

Research methods. This research uses a qualitative descriptive method that focuses on two students with high mathematical abilities with field-independent (FI) and field-dependent (FD) cognitive styles, who were selected from a total of 30 participants. Their mathematical abilities were assessed through a mathematical ability test, while their cognitive styles were identified as field-independent (FI) and field-dependent (FD) using the Group Embedded Figures Test (GEFT). This study involves six main stages, namely 1) selection of research subjects; 2) problem-solving tasks; 3) observation and video recording; 4) in-depth interviews; 5) analysis of critical thinking dispositions; and 6) summarizing the results of the analysis.

Results. The results of the FI student analysis showed quite strong confidence in reasoning by following mathematical steps to solve problems systematically. However, the inquisitive aspect of critical thinking still needs to be improved because students do not question or explore alternatives to solve problems. Although students are able to solve problems, the ability to question assumptions, verify results, and explore different approaches still needs to be developed so that their critical thinking is more comprehensive. The results of the FD student analysis showed reasonable Confidence in Reasoning, with confidence in every step of the calculation carried out. However, the Inquisitive aspect of critical thinking is still underdeveloped because there is no attempt to question, re-analyze, or consider alternatives in the problem-solving process. To strengthen their critical thinking disposition, students need to be encouraged to be more reflective and critical of every step taken, question the assumptions made, and explore various possible solutions to problems.

In ***conclusion***, Students show quite strong Confidence in Reasoning by applying mathematical calculation steps systematically and precisely to solve problems. However, the Inquisitive aspect of critical thinking is still underdeveloped because students do not question or explore alternatives in their problem-solving process. They tend to follow procedures without verifying or re-checking the results, which are essential aspects of critical thinking. Encouraging students to be more reflective and explorative in every step taken can help strengthen their critical thinking disposition.

KEYWORDS

disposition, critical thinking, cognitive style, field dependent, field independent, mathematics education

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INTRODUCTION

Critical thinking has become an essential skill in facing the challenges of the 21st century. TIMSS (Trends in International Mathematics and Science Study) recommends the importance of higher-order thinking, including critical thinking, as a crucial component in education. This is particularly relevant in the context of mathematics and science education, where students are not merely required to memorize information but also need to analyze, evaluate, and apply knowledge in complex situations [1]. On the other hand, UNESCO also views critical thinking as a vital skill for empowering the younger generation to make decisions that positively impact global society [2]. UNESCO emphasizes that critical thinking helps students understand global issues, such as sustainability, equity, and peace, and aids them in becoming adaptive and creative agents of change in tackling global challenges [3].

Several experts discuss the concept of critical thinking in two dimensions: critical thinking skills and dispositions [4]. Critical thinking skills refer to an individual's ability to engage in objective reflection, leading to logical conclusions regarding an argument or solution to a problem [5]. Meanwhile, critical thinking disposition is the consistent internal motivation to engage with issues and make decisions through the use of critical thinking [6]. Similarly, Robillos [7] describes critical thinking disposition as the consistent internal motivation to engage students in critical thinking. According to X. Liu & Jin, critical thinking disposition can be seen as a trait that reflects students' motivation and willingness to engage deeply in problem-solving [8]. Thus, critical thinking disposition is a measure of the tendency to think critically [9].

This study focuses on critical thinking disposition as the most important aspect of the critical thinking concept. As Facione [6] states, an individual needs an appropriate critical thinking disposition to effectively use critical thinking skills. Critical thinking skills are meaningless if not applied, so one must have the disposition to think productively and critically about issues [10]. Possessing critical thinking skills without the motivation to use them renders those skills ineffective [11]. Additionally, critical thinking disposition is crucial because it serves as the foundational step toward developing critical thinking skills [12].

Some experts describe the characteristics of individuals with critical thinking dispositions based on different traits in two dimensions: (1) related to life in general, including; (a) curiosity, (b) striving to obtain information, (c) readiness to utilize critical thinking, (d) confidence in reasoned inquiry, (e) self-confidence, (f) open-mindedness [13], (g) flexibility, (h) understanding others' opinions, (i) objectivity or fairness [14], (j) wisdom, (k) willingness to reconsider and revise if necessary, and (l) honesty [15]. (2) related to specific problems, questions, and challenges, including attributes such as: (a) the ability to ask appropriate questions regarding problem clarity; (b) thorough search for relevant information; (c) fairness in selecting and applying standards; (d) methodical approach to complex issues; (e) focus on key problems; (f) perseverance in the face of obstacles; (g) thoroughness in considering subjects and situations [16]. From another perspective, there are seven positive critical thinking dispositions, including truth-seeking, open-mindedness, analytical thinking, systematic thinking, confidence in reasoning, inquisitiveness, and judiciousness [15]. This study focuses on examining confidence in reasoning and inquisitiveness.

Confidence in Reasoning refers to an individual's belief in their ability to reason logically and carefully analyze problems [17]. Facione emphasizes that Confidence in Reasoning involves intellectual integrity and the bold desire to actively pursue the best knowledge in any situation [16]. Students with this disposition believe in their ability to make sound decisions and support their arguments with strong reasons and valid evidence [19]. They are less likely to be influenced by external pressure or others' opinions because they have high confidence in their thinking process. On the other hand, Inquisitiveness refers to a strong curiosity and desire to explore, understand, and learn more about various things [20]. Such individuals habitually seek good information, are curious about how things work, and strive to learn new things, even when the immediate benefit of knowing such things is not apparent [21]. Students with this disposition are always eager to learn, ask questions, and seek answers to the questions that arise in their minds [22]. They have a natural drive to dig deeper and are not satisfied with superficial answers [23].

Fundamentally, every individual possesses unique qualities that distinguish them from others. These individual differences include intelligence, thinking ability, cognitive style, personality, attitude, and interest [24]. One of the essential characteristics to consider when selecting and implementing learning forms and achieving desired learning outcomes is students' cognitive style differences [25]. Cognitive style refers to an individual's characteristics in understanding, analyzing, and responding to cognitive tasks [26]. Cognitive style is a persistent trait within a person [27]. Cognitive style is closely related to students' learning approaches and attitudes, which can significantly impact their academic achievement [26]. Each cognitive style has its strengths and weaknesses in terms of learning outcomes.

Cognitive style refers to how individuals perceive, process, store, think, and use information when facing different tasks or environmental situations [24]. Previous studies categorize cognitive styles into two categories: Field Independent (FI) and Field Dependent (FD) cognitive styles [26]. Individuals with an FD cognitive style tend to rely on external motivation and seek guidance and instructions from others. Conversely, individuals with an FI cognitive style approach problems analytically, have the ability to analyze and isolate relevant details, identify patterns, and critically assess problems [28]. These cognitive style differences can be measured using the Group Embedded Figures Test (GEFT) [24]. These various cognitive style characteristics can affect a student's ability to solve mathematical problems.

With an awareness of the diversity of students' cognitive styles and the challenges they face, education can provide appropriate interventions to enhance their problem-solving abilities. A study conducted by Batubara [29] shows that cognitive style significantly influences learning outcomes in various subjects, including mathematics and science. Furthermore, research by Alalouch [30] emphasizes the need to consider cognitive styles when evaluating academic performance, especially in fields requiring specific cognitive approaches. This implies that students' cognitive styles have a tendency to analyze and solve problems effectively in mathematics.

MATERIALS AND METHODS

This study is a qualitative descriptive study of grade IX students of SMP Islam Karangploso Malang, Indonesia. The subjects were selected using a purposive sampling technique. The criteria for the subjects were grade IX students who were able to solve mathematical problems using critical thinking with FI and FD cognitive styles. The subjects obtained in this study were two students.

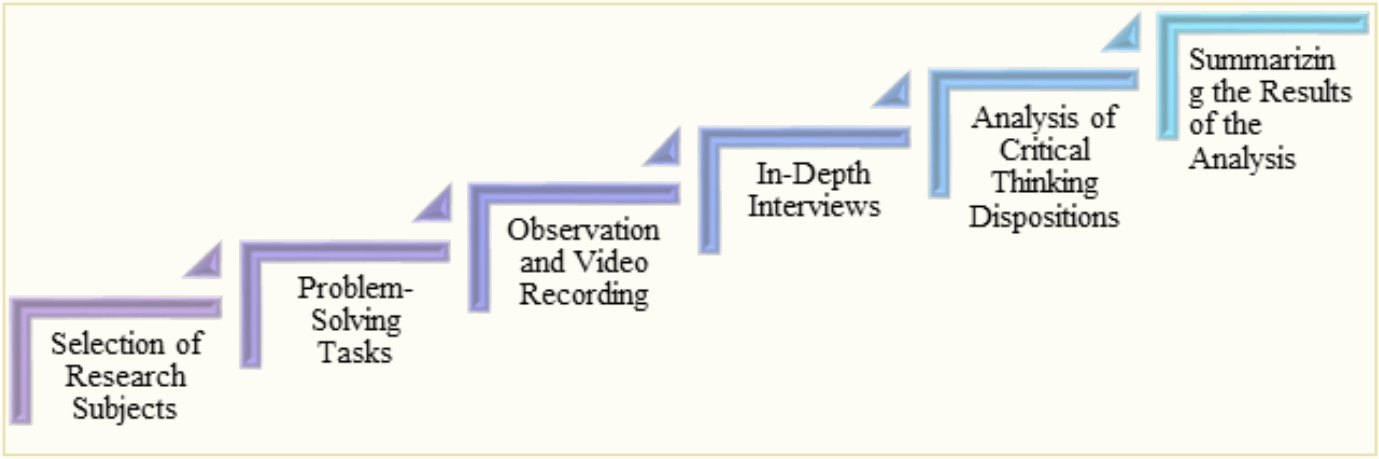


Figure 1 Research Stages

This study involved six main stages, namely: 1) selection of research subjects, two research subjects selected based on high mathematical ability with FI and FD cognitive styles. 2) problem-solving tasks: Students were given tasks in the form of two descriptive questions designed to test critical thinking skills in solving mathematical problems. 2) Observation and Video Recording:

Researchers conducted direct observations and recorded videos of each subject's activity when working on non-routine problems. Observations focused on the subjects' confidence in reasoning and inquisitive dispositions when completing tasks. 3) Analysis of Critical Thinking Disposition Components: Based on the results of observations and video recordings, researchers analyzed two components of critical thinking dispositions, namely confidence in reasoning and inquisitiveness. This analysis aims to conclude whether the subjects exhibit confidence in reasoning and Inquisitive behavior. 4) Data Triangulation and In-depth Interviews: To confirm the results of the analysis, researchers conducted in-depth interviews with subjects using semi-structured interview guidelines. In addition to interviews, data reduction was also carried out to eliminate unnecessary information. 5) Summarizing the Analysis Results: Researchers summarize the results of the analysis of the subject's critical thinking disposition based on observations, video recordings, and interviews. The final result of this study is the classification of the subject's confidence in reasoning and Inquisitive behavior in solving mathematical problems. The following is a table of indicators of critical thinking disposition in terms of confidence in reasoning and inquisitive aspects.

Table 1

Critical Thinking Disposition Indicators

Critical thinking disposition	Critical thinking disposition indicators
Confident in reasoning	Confident in solving problems Ability to explain and justify answers Ability to identify and resolve errors
Inquisitive	Desire to learn and understand The ability to see problems from multiple perspectives Ability to ask critical questions

RESEARCH RESULTS

Of the total 30 students who took the math ability test, only seven students were classified as having high math ability. This means that only about 23.33% of all students showed good or above-average math mastery. This data indicates that the majority of students (76.67%) have moderate or low math ability.

Table 2

Mathematical Test Ability

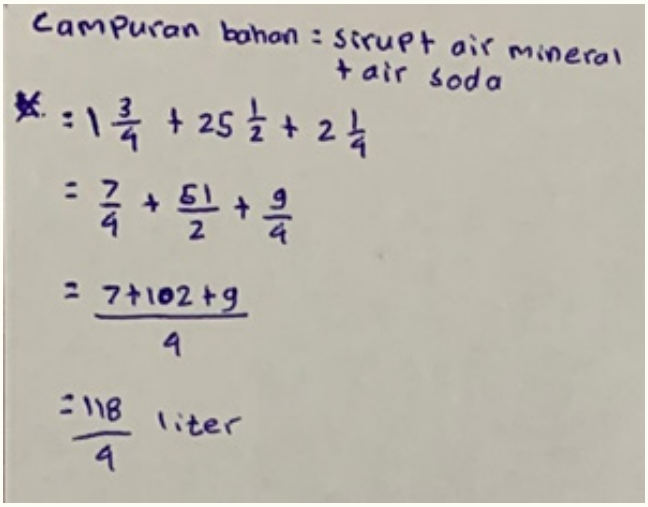
Student Ability	Number	Percentage
High	7	23,33
Medium	18	60
Low	5	16,67

This suggests that most students may need additional guidance or different teaching methods to improve their understanding of math. GEFT is a test used to measure students' cognitive styles, namely whether they tend to be Field-Independent (FI) or Field-Dependent (FD). Of the seven students who had high math ability, 5 of them fell into the FI category, while two students fell into the FD category. Thus, the subjects in this study were two students consisting of 1 FI student and 1 FD student.

Description of critical thinking disposition of FI student

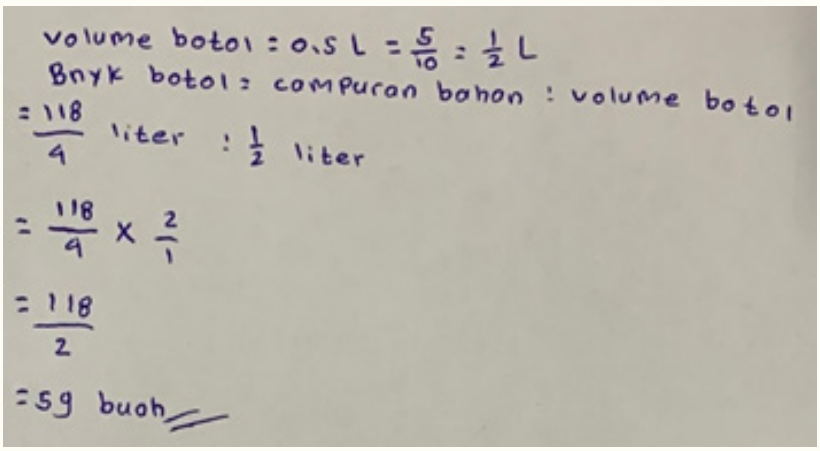
Question No. 1

The student demonstrated a strong confidence in using mathematical reasoning (Confidence in Reasoning) to solve the given problem. This was evident from the several calculation steps performed to combine the volumes of the ingredients and calculate the number of bottles needed. The interview results also indicated a sense of confidence in solving the problem, as the student stated, "*I am quite sure of my answer, sir... the result is that 59 bottles are needed*". The student began correctly by summing the volumes of the ingredients using fractions, which shows a basic understanding of how to combine different fractions. The student then proceeded to divide the total volume of the ingredients by the volume per bottle. Confidence in reasoning was shown through the correct use of formulas to calculate the number of bottles needed, followed by substituting the obtained values with the arrangement of steps and final calculations, converting mixed fractions into improper fractions. This aligns with the interview results when the student explained their steps, "*First, I found the total amount of the mixture by adding all the ingredients, so I got this (118/4 liter) sir. Then, I calculated the number of bottles needed, and I got 59*". The student converted the bottle volume from decimal to fraction and then performed the division. This indicates that the student trusted the method they used, even when faced with more complex calculations. It was also evident from the interview how the student identified and corrected errors: "*The syrup was one and three-quarters (1×3/4), mineral water was twenty-five and a half (25×1/2), soda water was two and a quarter (2×1/4), then I multiplied four by one plus three equals seven, and I did the same for the others, sir*".



Translation
Mixture of ingredients = Syrup + Mineral water + soda water
= 1×3/4+25×1/2+2×1/4
= 7/4+51/2+9/4
= (7+102+9)/4
= 118/4 liter

Figure 2 FI student's answers to find the amount of material mixture



Translation
Volume of bottles =0,5 L=5/10=1/2L
Number of bottles = mixture of ingredients / volume of bottles
= 118/4 liter ;1/2 liter
= 118/4 × 2/1
= 118/2
= 59 pcs

Figure 3 FI student's answers to find the number of bottles needed

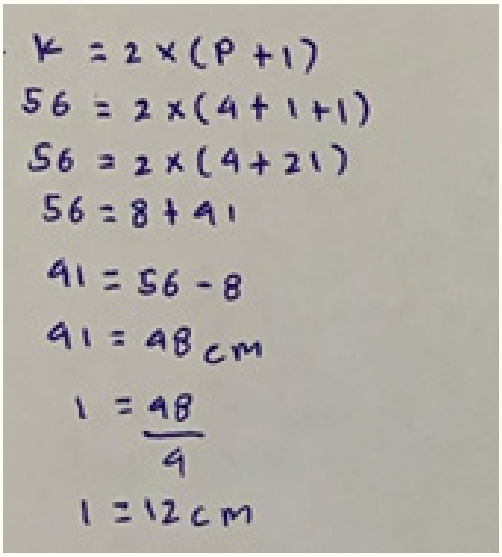
The student's inquisitive attitude in this response is underdeveloped. The student was more focused on following the calculation procedures rather than questioning or exploring those steps more deeply. There was no indication that the student questioned the accuracy of the final result or

the steps taken. For example, the student did not question whether the division of the total volume by the volume per bottle was done correctly or if other steps could have been taken to double-check the result. This is consistent with the interview results, where FI remained silent and confused when asked about this, responding with "*Hmm (silent while holding head), I don't know, sir.*" The student did not demonstrate critical reflection on whether the calculation steps were truly relevant or reasonable in the context of the problem, saying, 'I could only use that method, sir.' They followed the procedure without questioning the validity of the result or the method used.

FI displayed a strong confidence in reasoning for this first problem by systematically following the mathematical steps to solve it. However, the Inquisitive aspect of critical thinking still needs improvement, as the student needs to question or explore alternatives in problem-solving. Although the student was able to solve the problem, the ability to question assumptions, verify results, and explore different approaches still needs to be developed to make their critical thinking more comprehensive.

Question No. 2

In the aspect of Confidence in Reasoning on the second problem, the student demonstrated reasonable confidence in applying mathematical calculation steps to determine the length, width, and area of a rectangle based on the given information. The student began by using the perimeter formula to find the length and width of the rectangle. They confidently manipulated the perimeter formula k = 2 (p + l) and substituted the given numbers into the formula. The student followed the algebraic process in the correct order, such as simplifying the equation and rearranging terms to solve for the width l. This step indicates confidence that the method and steps taken were correct, saying, "*I used the perimeter formula, sir, to find the value of l, then I substituted it here (p = 4+ l)...*' After finding the length and width, the student proceeded to calculate the area using the appropriate formula, "*To find p, then I calculated the area, sir, and got 192*". This confirms that the student was confident in their understanding of basic geometry concepts, saying, "*I'm quite sure about this second problem, sir*".

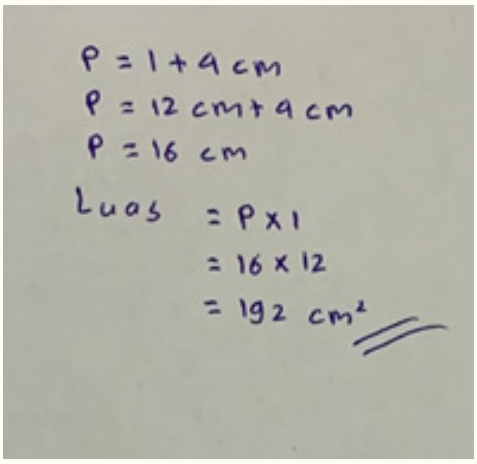


Translation
k = 2 (p + l)
56 = 2 (4+ l + l)
56 = 2 (4 + 2l)
56 = 8 + 4l
4l = 56 – 8
l = 48/4
l = 12 cm

Figure 4 FI student's answers to search for values l

The student's inquisitive attitude is lacking in this response. The student tended to accept and follow the procedures they had learned without questioning or exploring the steps taken in more depth. The student showed no signs of questioning whether there were alternative methods to find the length and width or ways to verify their results, saying, "*I didn't find any other way, sir*". A more robust, inquisitive attitude encouraged the student to explore different approaches or double-check their calculations. There was no indication that the student reviewed or reflected on the steps they took, saying, "*I don't need to check again, sir; this is enough*". An inquisitive attitude typically

drives students to look for errors or to ensure that the final results are correct and reasonable. The student's inquisitive attitude is lacking in this response. The student tended to accept and follow the procedures they had learned without questioning or exploring the steps taken in more depth. The student showed no signs of questioning whether there were alternative methods to find the length and width or ways to verify their results, saying, "*I didn't find any other way, sir*". A more robust, inquisitive attitude encouraged the student to explore different approaches or double-check their calculations. There was no indication that the student reviewed or reflected on the steps they took, saying, "*I don't need to check again, sir; this is enough*". An inquisitive attitude typically drives students to look for errors or to ensure that the final results are correct and reasonable.



Translation
p = l + 4 cm
p = 12 cm + 4 cm
p = 16 cm
Area = p × l
= 16 × 12
= 192 cm2

Figure 5 FI student's answers to finding the area of a rectangle

A student with the FI cognitive style demonstrated strong Confidence in Reasoning on the second problem by systematically and accurately applying mathematical calculation steps to solve it. However, the Inquisitive aspect of critical thinking is still underdeveloped, as the student did not question or explore alternatives in their problem-solving process. They tended to follow procedures without verifying or double-checking the results, which is an essential aspect of critical thinking. Encouraging students to be more reflective and explorative in each step they take can help strengthen their critical thinking disposition.

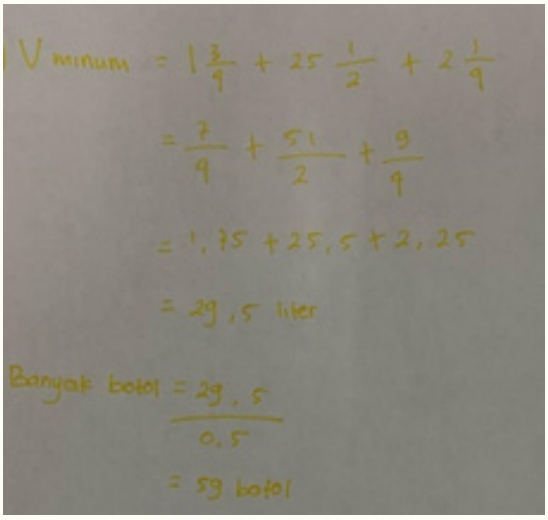
Description of critical thinking disposition of FD students

Question No. 1

The student demonstrated Confidence in their mathematical reasoning. This was evident from the way the student converted fractions to decimals and then added those numbers to find the minimum volume. The student also used logical calculations to determine the number of bottles needed, which shows that they trusted the steps and the results they achieved. The student confidently converted fractions into decimal form and then performed the addition, saying, 'I have to be confident in my answer, sir.' This process indicates that the student understood the basic concepts of fractions and decimals and how to use them in the context of more complex calculations, saying, "*I directly calculated the drink's volume by adding everything up, sir. Then I converted this fraction (1×3/4) into this form (7/4), and then I divided to get this value (1.75, 25.5, 2.25), sir...*". The student then proceeded with the division to find the number of bottles needed, showing confidence in using basic mathematical operations to solve the given problem, saying, "*Once I got the value, I divided it by 0.5, so I got 59 bottles, sir*".

Although the student demonstrated the ability to perform calculations, there needed to be an indication of further exploration or critical questioning regarding the information provided or the results obtained. The student tended to focus on directly solving the problem without questioning assumptions or exploring alternatives. There were no signs of further exploration of the problem, such as considering whether the method used was the best approach or whether other factors could influence the outcome, saying, '*Maybe there's another way, but I don't know, sir.*' This suggests that

while the student was able to solve the problem, their inquisitive or critical curiosity may still need to develop fully. There was no evidence that the student considered the context or checked the accuracy of the information used (e.g., whether 0.5 liters was actually the volume of the bottle used or just an assumption). This indicates that the student may need to be more accustomed to questioning or verifying the information provided within the context of the problem.



Translation
Drinking Volume = 1 × 3/4 + 25 × 1/2 + 2 × 1/4
= 7/4 + 51/2 + 9/4
= 1.75 + 25.5 + 2.25
= 29.5 liter
Lots of bottles = 29.5/0.5 = 59 bottle

Figure 6 Student FD's answer to finding the amount of mixed material and the number of bottles

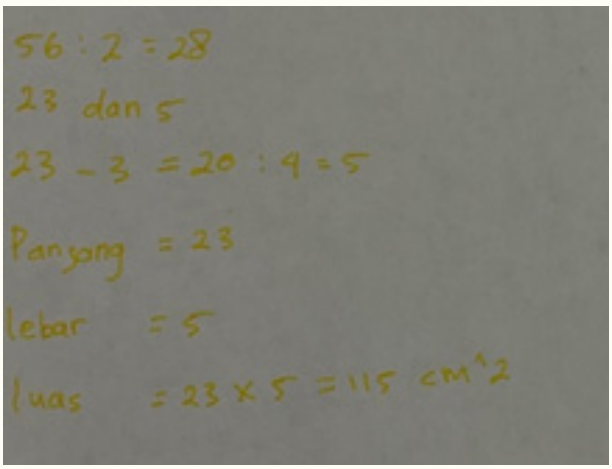
The student with an FD cognitive style demonstrated reasonable Confidence in Reasoning when answering the first problem, showing confidence in the mathematical calculation steps taken. However, the Inquisitive aspect of critical thinking may still need to be fully developed, as there were no signs of further exploration or critical questioning of the given problem or the assumptions they made. To strengthen their critical thinking disposition, the student could be encouraged not only to focus on the outcome but also to question the process and information used during problem-solving.

Question No. 2

The student demonstrated confidence in using mathematical reasoning, or Confidence in Reasoning, to solve the problem. This was reflected in how the student broke down the numbers and performed mathematical operations to find the length, width, and area, saying, 'I'm confident, sir.' The student appeared to trust the calculation process they followed, from the initial division to the area calculation. The student began by dividing 56 by 2 to get 28 and then continued with other operations to find the length and width. These steps indicate that the student was confident in the mathematical approach they took. When the student subtracted three from 23 to get 20 and then divided it by 4 to get 5, they did so with confidence. However, there might have been some inaccuracies in the mathematical logic used, resulting in the wrong answer. The interview results showed that the student struggled to understand the problem, saying, 'I was confused, sir, so I just divided the perimeter by two to get 28,' and 'I just chose 23 and 5 because they add up to 28 to determine the length and width.' The student finished by calculating the area using the correct formula (length × width), showing confidence in applying basic mathematical concepts. However, they encountered difficulties in determining the length and width due to a lack of understanding of the problem.

The student's inquisitive attitude in this response is lacking. The student tends to accept the numbers and operations used without questioning whether the steps are entirely logical or appropriate for the problem's context. The student focused on solving the problem without exploring potential errors or considering alternative approaches. There were no signs that the student questioned the results they obtained or re-evaluated whether the steps taken were the most appropriate. For example, there is no indication that the student questioned the rationale behind subtracting three from 23 or the subsequent division, which might be less relevant or need re-evaluation in a broader context, saying, "*I was also confused, sir, so I subtracted 3 from 23 to get 20 and then divided by 4 to get 5*". The student did not show curiosity or effort to understand

the problem's context more deeply. The student's response was more focused on the calculation procedure rather than the validity of the process or the reasoning behind each step. Observations also indicated difficulties when the student started understanding the problem and choosing the incorrect procedure to determine the length and width of the rectangle.



Translation
56/2 = 28
23 and 5
23 -3 = 20/4 = 5
Length = 23
Width = 5
Area = 23 × 5 = 115 cm^2

Figure 7 Student FD's answer to finding the area of a rectangle

The student with an FD cognitive style demonstrated fairly good Confidence in Reasoning on the second problem, showing confidence in each calculation step. However, they still struggled with identifying and addressing issues. The Inquisitive aspect of critical thinking is underdeveloped, as there was no effort to question, re-analyze, or consider alternatives in the problem-solving process. To strengthen their critical thinking disposition, students need to be encouraged to be more reflective and critical in each step they take, question the assumptions made, and explore various problem-solving possibilities."

DISCUSSION

The results of this study indicate that students with field independent (FI) and field dependent (FD) cognitive styles exhibit clear differences in their approaches to solving mathematical problems. FI students tend to demonstrate strong Confidence in Reasoning, as evidenced by their ability to solve problems systematically and accurately. However, they show less development in the Inquisitive aspect, particularly in their curiosity to question and explore alternative solutions. In contrast, FD students also demonstrate Confidence in Reasoning but tend to rely more on external structures and are less reflective about the assumptions they make.

These findings are supported by other studies highlighting the role of cognitive styles in critical thinking and problem-solving. For example, recent research by Nasrabadi et al. [31] confirms that FI students excel in applying procedural steps and have high confidence in making decisions based on logic. They tend to follow a clear and structured logical path when solving problems, which aligns with this study's findings that FI students are able to follow mathematical procedures well and arrive at the correct answers.

Aydın & Uysal [32] also found that FI students focus more on tasks that require analytical and systematic thinking, which boosts their confidence in solving mathematical problems. However, the Inquisitive aspect, such as exploring assumptions or seeking alternative approaches, is often underdeveloped. This is highly consistent with the findings of this study, which show that although FI students succeed in solving problems accurately, they rarely question assumptions or develop alternative solutions.

On the other hand, Zhang et al. [33] also found that FD students rely more on external cues and feel more comfortable following procedures provided by teachers or pre-established instructions. Although FD students are confident in solving mathematical problems, they rarely show a desire to review their results or consider other approaches. This suggests that the FD

style tends to be more conservative in terms of exploration and the development of creative solutions, supporting the findings that FD students in this study exhibit strong Confidence in Reasoning but are weaker in the Inquisitive aspect.

Although many other studies align with the findings of this research, there are some recent studies that offer slightly different perspectives. For instance, a study by Muis et al. [34] notes that with the right teaching approach, FI students can be encouraged to become more reflective and explorative in problem-solving. When given challenging tasks and prompted to engage in deeper critical thinking, FI students may begin to question the assumptions they use and explore various alternative solutions. This contrasts somewhat with the findings of this study, which show that FI students tend not to question the processes they follow.

Additionally, research by De Corte et al. [35] found that FD students exposed to project-based or collaborative learning can develop their Inquisitive abilities. Through social interaction and group work, FD students are more inclined to explore different solutions and question their assumptions. This indicates that with more dynamic learning strategies, FD students also have the potential to enhance their curiosity, which was not observed in this study.

The finding that both FI and FD students demonstrate strengths in Confidence in Reasoning but weaknesses in Inquisitive has important implications for education, particularly in developing critical thinking skills. Based on the results of this study, it is clear that although students with different cognitive styles have confidence in following logical procedures, they need more encouragement to develop their reflective and explorative abilities. This aligns with recent research by Facione [16], which emphasizes that critical thinking involves more than just logical ability—it also encompasses the curiosity to question assumptions, explore solutions, and critically evaluate various alternatives.

Disposition allows us to predict how likely someone is to act or react in various situations [4]. It is an individual's consistent internal motivation to respond to people, events, or circumstances in a habitual way, though it can be shaped over time [7]. Critical thinking disposition is an attitude that can be developed, although its development may take longer than the development of critical thinking skills [36].

Every student needs to have a critical thinking disposition because it encourages them to think productively and critically about a problem [17]. As'ari et al. [13] emphasize that a person with a critical thinking disposition will not accept information without making efforts to verify its accuracy. Given the importance of critical thinking disposition for students, they need to be trained to consistently demonstrate this disposition, both in the classroom and in everyday life.

CONCLUSION

Students showed quite strong confidence in reasoning by applying mathematical calculation steps systematically and precisely to solve problems. However, the Inquisitive aspect of critical thinking still needs to be developed because students need to question or explore alternatives in their problem-solving process. They tend to follow procedures without verifying or re-checking the results, which are essential aspects of critical thinking. Encouraging students to be more reflective and explorative in every step they take can help strengthen their critical thinking disposition.

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