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EXPLORING ELEMENTARY SCHOOL STUDENT'S COMPUTATIONAL THINKING IN TERMS OF COGNITIVE STYLE

Bambang Adi Suwarno[1], Masduki[2*]
[1,2]Faculty of Teacher Training and Education, Universitas Muhammadiyah Surakarta, Indonesia.
*Correspondence: masduki@ums.ac.id

ABSTRACT
Mathematics learning in the independent curriculum emphasizes the pedagogical dimension which aims to create active students so that they are able to develop their thinking patterns and get them used to finding solutions to their own problems. This study uses qualitative methods to investigate elementary school students' abilities through computational thinking, focusing on the cognitive styles of Field Independence (FI) and Field Dependence (FD). The subjects in this study amounted to 14 fifth grade students of public elementary schools in Klaten Regency, Central Java Province. Researchers used data collection instruments in the form of test, learning style questionnaires and interviews. The number of test compiled consisted of 5 items. Before use, the test were validated by 3 mathematics education experts and tested on 5 fifth grade students. After validation and testing, the test that can be used consist of 3 test. Based on the results of tests and learning style questionnaires, research took one of the students' test results with a Field Independent learning style and 1 student with a Field Dependent learning style. The results of this study indicate that there are differences in the computational thinking process of the two subjects in solving problems. At the abstraction stage, FI students are able to answer important factors that need to be considered in making conclusions, FI students are also able to explain alternative solutions to the problems given appropriately. Meanwhile, FD students tend to work directly so they tend to experience errors at the pattern recognition, algorithm thinking and generalization stages. Thus, it can be concluded that students with a field independent cognitive style are more active in using computational thinking processes than students with a field dependent cognitive style.
Keywords: Computational Thinking, Learning Style, Field Dependent, Field Independent

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PRELIMINARY

In the 21st century's era of the fourth industrial revolution, rapid technological advancements have profoundly influenced multiple aspects of life, particularly education. Education assumes a critical role in enhancing students' global competitiveness by ensuring they acquire essential technical knowledge and skills necessary to thrive in this transformative age (Tsai & Tsai, 2018). One of the 21st century skills that students must have is computational thinking (Selby, 2015). (Maharani et al., 2019) also explained that computational thinking skills are very important for students in the 21st century because they not only find the solution to the problem but also how to solve it. Students' computational thinking skills play a role in helping students solve math problems. (Vourletsis & Politis, 2020). Therefore, computational thinking skills need to be trained in mathematics learning. (Azizah et al., 2022)..

Computational thinking (CT) is a widely applicable form of literacy that is currently required in solving problems in various fields. (Lee et al., 2023). Computational thinking is a strategy or ability with basic computational concepts to solve problems, develop systems, and understand human actions (Wing, 2006). (Bocconi et al., 2016) also suggested that computational thinking is a thought process to design, evaluate, and solve problems using analytical techniques and algorithms. Computational thinking is defined as the skill to solve problems by the systematic application of abstracting, abstraction, algorithmic design, generalization, and evaluation that can be performed by digital devices or humans. (Selby, 2013).

Problem solving ability through computational thinking has various indicators. (Bocconi et al., 2016) suggests that problem solving ability through computational thinking can be seen from someone who is able to (a) decompose complex problems into simpler problems to facilitate the design of solutions (abstract); (b) from the problems that have been described then identify patterns that exist in the problem (pattern recognition); (c) the process of solving problems in the form of steps (algorithms); (d) solving problems using information that has been obtained (Generalization). In line with the opinion (Csizmadia et al., 2015) stated that the components of computational thinking include abstraction, pattern recognition, algorithms, generalization and generalization Thus, indicators of problem-solving ability through computational thinking are abstraction, pattern recognition, algorithm thinking, and generalization.

Judging from the results of the Bebras competition in 2023, it shows that 1% of participants scored above 80 and 97% of 9092 participants scored less than 60. In addition, based on the results of the *Program International Student Assessment* (PISA) study in 2022, Indonesia ranks 69th out of 81 countries in the mathematics category. Based on the PISA results in 2022, it shows an increase in rank but also a decrease in score compared to 2018, which in 2018 obtained a score of 379, while in 2022 it was 366. (OECD, 2023). PISA measures problem-solving and reasoning skills (Rosana et al., 2020). If the PISA results are not good then the ability to think computationally is also not good because the ability to think computationally is seen from the way a person solves math problems (Supiarmo et al., 2022).

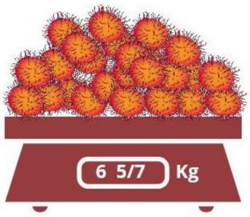
In addition, mathematical understanding ability is also needed, because mathematical understanding ability is one of the important goals in learning, giving the understanding that the material taught to students is not just memorization, but more than that with understanding students can better understand the concept of the subject matter itself (Intan & Rosyid, 2020). The characteristics of the way students learn is one of the factors that affect problem solving abilities (Firmansyah & Syarifah, 2023). Each student has their own methods and techniques in understanding information (Sheromova et al., 2020). One of the efforts to improve the quality of education and the ability to solve math problems in students is to further consider the development of cognitive styles in the process of learning mathematics. The way an individual receives, remembers, and thinks or as special ways of receiving, storing, forming, and utilizing information is the definition of cognitive style. (Muhtarom, 2012). Cognitive style can be divided into two types, namely cognitive style field independence (FI) and field dependence (FD), it is based on student psychology (Darmono, 2012). Students with cognitive style field independence (FI) is a characteristic of individuals who are able to analyze and explain in separating elements of the context. While students with field dependence (FD) style is characteristic of individuals who process information as a whole so that their views are easily influenced by their environment (Suhatini et al., 2019).

Research related to CT in terms of differences in cognitive style has been done by (Mukhibin et al., 2024) showed that the learning outcomes of students who have a cognitive style field dependent lower than students who have a cognitive style field independent. Research by (Widahyu & Zul Amry, 2022), shows that students with a field independent cognitive style are more conceptual than students with a field dependent cognitive style in implementing solution plans to get the correct answer. Research by (Baiduri, 2015), shows that students with field independent and field dependent cognitive styles have significant differences in the completion steps. However, the research was conducted on junior high school students. Meanwhile, research to examine CT ability in terms of cognitive style in elementary school students has not been found. Thus, this study aims to explore the ability of students' computational thinking in terms of cognitive style. The findings of this study are expected to be the basis for educators to understand students' computational thinking ability.

METHODS

This research is a qualitative research with a case study design. The subjects in this study were 14 5th grade students from one of the public elementary schools in Klaten Regency. Data collection during this study used 3 instruments, namely test instruments, learning style questionnaires and interviews. This study used 3 questions about computational thinking from question in previous research related to computational ability (Azizah et al., 2022). The researcher looked for reference test on the Kemendikbud website and Student Worksheets contained in the 5th grade material, then selected test that were in accordance with the material on this research topic. The test that meet the criteria consist of 5 items, before being used the test have been validated by trhee expert teachers of elementary school mathematics learning. The test were tested on 5 grade 5 students, in addition to the subjects for this study. Then, the researcher improved the questions and the wording of the questions to be easily understood by students. Thus, the questions that will be used are in accordance with the results of expert validation and research results. This trial was used for time alignment when tested on 5 students, so students were only able to solve 3 questions with 60 minutes. Thus, researchers only used 3 test questions as an instrument for collecting data on students' computational thinking skills. The three test used for data collection of students' computational thinking are presented in Table 1.

Table 1. Mathematical Computation Ability Test

No.	Question
1.	 Mrs. Winda bought $6\frac{5}{7}$ kg of rambutan at the market. On the way home, Ms. Windah stopped by to give $2\frac{2}{5}$ kg of rambutan to Ms. Tiwi. Calculate the weight of the rambutan carried by Mrs. Windah's pulaang is .....kg a. Write down what are the important things that are known in the problem and what is asked in problem number 1? b. After knowing what is important and what is being asked, investigate what solutions can be used to solve problem number 1! c. Write down the steps and solve problem number 1 coherently! d. After solving the problem coherently write down the conclusion of solving problem number 1!

2

Describe the costs required to produce seeds and fertilizers for rice fields per season?

a. Write down what are the important things known in the problem and what is asked in problem number 2?
b. Now that you know what is important and what is being asked, investigate what solutions can be used to solve problem number 2!
c. Write down the steps and solve problem number 2 coherently!
d. After solving the problem coherently write down the conclusion of solving problem number 2!

3

Mrs. Raisya received several cake orders for her neighbor's circumcision event. Inu Raisya checked the available supply of wheat flour which was $4\frac{1}{4}$ kg, while the flour needed by the mother to make the cake was $7\frac{1}{2}$ kg. Mom asked Kiki to go shopping at the market, Kiki bought 5 kg of flour. Calculate the remaining flour that the mother did not use?

a. Write down what are the important things known in the problem and what is asked in problem number 3?
b. After knowing what is important and what is asked, investigate what solution determination can be used to solve problem number 3!
c. Write down the steps and solve problem number 3 coherently!
d. After solving the problem coherently write down the conclusion of solving problem number 3!

Furthermore, research using questionnaires congnitif style studied at the time of learning, especially learning mathematics is a cognitive style that is distinguished based on differences in areas or fields, namely: cognitive style *field independent* (FI) and *field dependent* (FD) (Zakiah, 2020). Based on the results of cognitive style questionnaire given to 14 students obtained data presented in Table 2.

Table 2. Data from the Student Learning Style Questionnaire Results

No.	Learning Style	Many Students
1	*Field Independent*	6
2	*Field Dependent*	8

Based on Table 2, there are 14 students who have done the learning style questionnaire, the results are 6 students each 6 students have an FI thinking style and 8 students have an FD thinking style, after the researcher gets the results taken 2 students who have an FI thinking style and 2 students who have an FD thinking style. The data obtained from students' answers in the computational thinking ability test were then analyzed using the rubric presented in Table 3.

Table 2. Rubric for Assessment of Computational Thinking Ability

Indicator	Form of Assessment	Score
Abstract	Learners can identify the known and questionable information from the problems in the problem correctly.	3
	Learners can identify known and questionable information from the problems in the problem but partially.	2
	Learners can identify known and questionable information from the problems in the problem but are not precise.	1
	Learners cannot identify known and questionable information from the problems in the problem or do not work.	0
Pattern Recognition	Learners can determine the pattern or formula learned previously correctly.	3
	Learners can determine previously learned patterns or formulas but partially.	2
	Learners can determine patterns or formulas learned previously but are less precise.	1
	Learners cannot determine patterns or formulas learned previously or do not work on	0
Algorithmic Thinking	Learners can complete the algorithm or problem solving sequentially appropriately.	3
	Learners can complete the algorithm or problem solving sequentially but partially.	2
	Learners can complete the algorithm or problem solving sequentially, but not enough Right.	1
	Learners cannot complete the algorithm or problem solving or do not work.	0
Generalization	Learners can conclude the problem solving in the problem correctly	3
	Learners can conclude the problem solving in the problem but partially	2
	Learners can conclude the problem solving in the problem but less precise.	1
	Learners cannot conclude the problem solving in the problem or do not work.	0

Based on the test results, the examiner conducted interview activities which were used to find out more accurately about the students' completion steps in solving the computational ability test. The test results of 5 subjects are presented in Table 4.

Table 3. Computational Thinking and Cognitive Style Test Results

Code	**Question Score 1**				**Problem 2 Score**				**Score Question 3**				**Total**	**Cognitive Style**
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**		
S1	2	3	3	3	3	2	0	3	0	0	0	0	19	FD
S2	2	3	1	1	3	3	0	1	0	0	0	0	14	FI
S7	2	3	3	2	3	1	1	1	0	0	0	0	16	FD
S8	2	2	3	2	3	1	0	3	3	0	0	0	19	FD
S10	2	3	3	3	3	1	0	3	1	1	0	1	21	FI

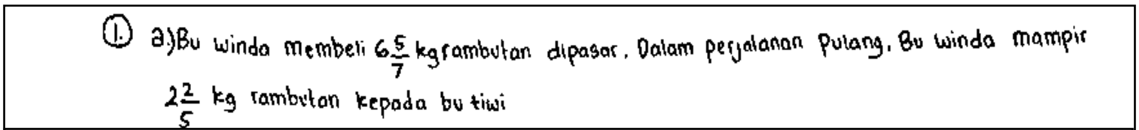
RESULT AND DISCUSSION

In this section the examiner presents student answers related to the results of mathematical computational thinking in terms of student cognitive style categories. Here students with learning style *Field Independet* given code S10 and students with learning style *Field Dependet* given code S1. The differences between the two learning styles are explained as follows:

Field Independent (FI)

1. Abstract

Based on the results of the analysis, the five subjects can write what is known from the problem correctly as in the abstraction indicator. We can see this in the answer to question number 1 by S10 presented in Figure 1 as follows.


(1) a) Bu winda membeli $6\frac{5}{7}$ kg rambutan dipasar. Dalam perjalanan Pulang, Bu winda mampir $2\frac{2}{5}$ kg rambutan kepada bu tiwi

1. Bu Winda bought $6\frac{5}{7}$ kilograms of rambutans at the market. On her way home, Bu Winda stopped and gave $2\frac{2}{5}$ kilograms of rambutans to Bu Tiwi.

Figure 1. The answer to question number 1 by S10 on the abstract indicator

In Figure 1. The results of the work of student S10 show that, students are able to know important information in the problem, student S10 presented the problem Mrs. Winda bought $6\frac{5}{7}$ kg of rambutan at the market. On the way home, Mrs. Windah stopped by to give $2\frac{2}{5}$ kg of rambutan to Mrs. Tiwi. Calculate the weight of the rambutan that Mrs. Winda brought home is .....kg.

Student S10 is able to write what is known from the problem but does not write what is asked in the problem, such as calculate the weight of the rambutan that Mrs. Winda brought home. So at this stage student S10 is able to write down the known information only, the following is an excerpt of an interview conducted with student S10 to strengthen his answer as follows:

Researcher: "Explain again why you wrote the known and the questioned like that?"

S10 : " I wrote down what is known from the question Bu Winda bought $6\frac{5}{7}$ kg of rambutan at the market. On the way home, Ms. Winda stopped by to give $2\frac{2}{5}$ kg of rambutan to Ms. Tiwi. Oh yes, sis, for what is asked, sis, calculate the weight of the rambutan that Mrs. Winda brought home."

Based on the analysis of the subject's answers, it can be concluded that the subject with field independent cognitive style is able to show the ability of mathematical computational thinking on abstraction indicators although for the question part of the question he forgot not to write it down, but during the interview the student was able to explain again.

2. Pattern Recognition

Based on the results of analyzing the answers to test on 5 subjects, students can recognize the pattern of solving the problem. Obtained pattern recognition on cognitive learning style indicators field independent can determine the pattern in accordance with the problem and students can present answers to the introduction of the pattern correctly. In this problem is shown in Figure 2 which is answered by student S10 as follows.

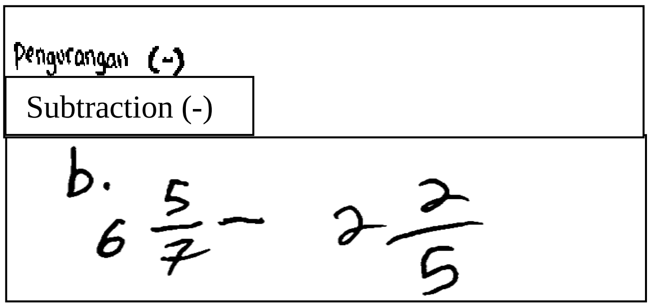


Figure 2. The answer to question number 1 by S10 on pattern recognition indicator

Figure 2 shows that student S10 is able to determine the appropriate pattern correctly. The pattern in question is bu winda's rambutan as much as $6\frac{5}{7}$ **kg** and given to bu tiwi $2\frac{2}{5}$ **kg**, then the introduction of the pattern here is that bu winda's rambutan will be reduced as much as bu tiwi receives rambutan from bu windah. This data is supported by the interview excerpt presented as follows.

Researcher:"Then for pattern recognition, explain whyused a subtraction pattern."

S10 : "Because Ms. Winda gave the rambutan to Ms. Tiwi."

3. Algorithmic Thinking

Based on the results of analyzing the answers that have been done by 5 subjects, on the algorithm thinking indicator, subjects with *field independent* learning styles are able to solve the problems in this problem, students can determine the steps correctly so that the results obtained are correct. The results of S10's answers regarding thinking algorithms are shown in Figure 3 as follows.

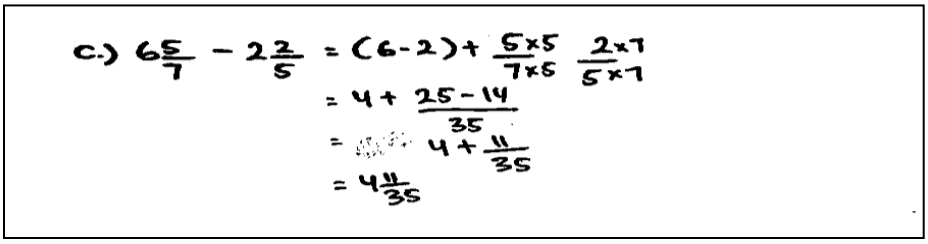


Figure 3. The answer to question number 1 by S10 on the algorithm thinking indicator

Based on Figure 3, it shows that S10 is able to solve the problem correctly using the formula from the problem in question number 1 and produce the right answer. Grouping the mixed fractions then operate addition and subtraction.$(6-2)+\left(\frac{5}{7}\times\frac{5}{5}-\frac{2}{5}\times\frac{7}{7}\right)$ at this stage S10 equalized the denominator by finding the LCM of 7 and 5 obtained which is 35. Next, S10 grouped the fractions because they already had the same denominator.

$4+\frac{25-14}{35}=4+\frac{11}{35}$. The last step S10 immediately adds and gets

$4\frac{11}{35}$ results. This answer is supported by the interview excerpt to S10 presented as follows.

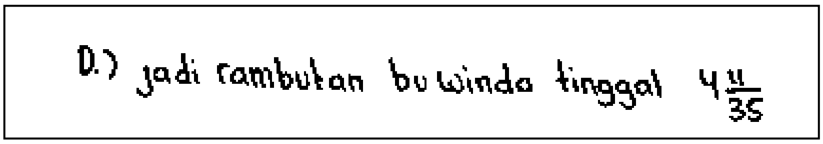
Researcher: "Can you explain the steps to solve the subtraction?"

S10 : "For$6-2$, then for the fractions equate the denominator$\left(\frac{5}{7}\times\frac{5}{5}-\frac{2}{5}\times\frac{7}{7}\right)$ and get the result $4\frac{11}{35}$."

Thus, S10 students can demonstrate the ability to think algorithmically appropriately using the completion steps coherently.

4. Generalization

At the Generalization 5 stage, students can conclude the results of problem solving in the problem. This is shown in the results of student S10's solution regarding this stage in Figure 4 as follows.



Therefore, Bu Winda has $4\frac{11}{35}$ kilograms of rambutans left.

Figure 4. The answer to question number 1 by S10 on the Generalization indicator

Figure 4 shows that student S10 is able to conclude the solution to problem number 1 correctly, that the number of rambutans that Mrs. Winda brought home is $4\frac{11}{35}\ kg$. The answer is supported by the interview excerpt of student S10 as follows.

Researcher: "Why did you conclude the weight of the rambutan that Mrs. Winda brought home as you answered?"

S10 : "Because that's the final result of the subtraction."

Thus, S10 students are able to think computationally on the Generalization indicator by concluding the results of solving problem number 1.

Based on the results of the analysis of the completion of answers and student interviews above, it can be concluded that S10 students with *Field Independent* congnitive style know the problem and need complete instructions to describe the data obtained from the problem. In the pattern recognition and problem solving stages, student S10 wrote down the steps that were arranged in full. In the last stage, S10 students can also conclude the answer according to the indicator asked by problem number 1, then double-check the results obtained. This can be seen in each stage of problem solving contained in the discussion above.

Field Dependent (FD)

1. Abstract

Subjects with *field dependent* cognitive style can present the information contained in the three test given. This can be seen in the example of S1 answer question number 2, as presented in Figure 5 as follows.

2. a) Production value = 15.1 million
Production cost = 10.6 million
Fuel = 1.48%
Wages = 61.04%
Seeds = 2.60
Pesticides = 3.09%
Equipment rental = 3.98%
Others = 5.85%
Land rent = 10.68%
Fertilizer = 11.28%

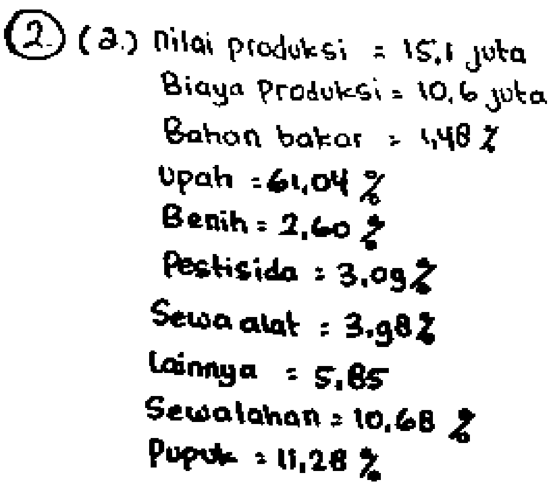


Figure 5. The answer to question number 2 by S1 on the Abstract indicator

Figure 5. Shows that S1 is able to write down information such as production value $= 15{,}1\ juta,$ production cost $= 10{,}6\ juta$, fuel = $1{,}48\%,$ wages $= 61{,}04\%,$ seeds $= 2{,}60\%,$ pesticides $= 3{,}09\%,$ tool rental $= 3{,}98\%,$ other = 5.85, land rent = $10{,}68$ %, fertilizer $= 11{,}28\%.$ but at this point S1 students are not able to present the question of the question which is the cost needed to produce seeds and fertilizer for rice fields per season. S1's answer is supported by the following interview excerpt.

Researcher: "Try to explain again, why did you write the information given like that?"

S1 : "For what is known in the figure such asproduction value $= 15{,}1\ juta,$ production cost $= 10{,}6\ juta$, fuel = $1{,}48\%$, and others."

Researcher: "What does the question ask?"

S1 : "For what is asked, I'm confused, maybe thecosts needed to produce seeds and fertilizers."

Thus, it can be concluded that S1 can show computational thinking skills on decompositional indicators, namely representing mathematical information but when asked the problem of the problem S1 students are still confused.

2. Pattern recognition

Based on the analysis of the answers to the test, the three *field dependent* subjects were able to recognize the pattern of the problem presented. However, student S1 did not write the introduction of the pattern or formula used to solve the problem. But S1 immediately worked on the steps to solve the problem, as seen in Figure No. 6. This is supported by the interview excerpt as follows.

Researcher: "Explain the pattern recognition used to solve problem 2?"
S1 : "Using multiplication."

Thus, it is concluded that S1 students know the pattern recognition used to solve problem number 2, but do not write it completely at the pattern recognition stage.

3. Algorithmic Thinking

The subject can write down the steps of solving question number 2. But there are errors in the operation. This is shown in the example answer
S1 related to question number 2 as presented in Figure 6.

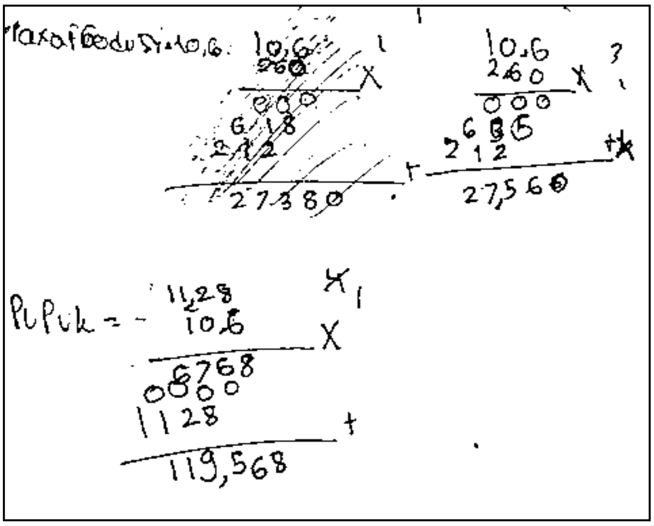


Figure 6. The answer to question number 2 by S1 on the Algorithmic Thinking indicator

Figure 6 shows that S1 wrote down the multiplication steps to solve the problem in problem number 2. The steps used by S1 are appropriate but there is an incorrect calculation operation, so the answer obtained is wrong. This can be supported by the following interview excerpt.

Researcher: "Explain the steps to solve the multiplication of fractions?"

S1 "Seed times production cost and fertilizer times production cost."

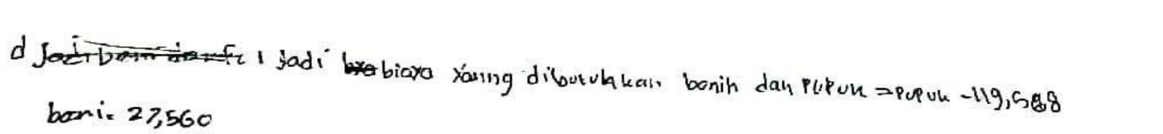
Researcher: "Why didn't you write it down?"

S1 : "I forgot."

Thus, it is concluded that S1 students are not able to show mathematical computational ability on the indicator of algorithmic thinking, namely compiling the solution steps to get the solution to the problem presented and the answers found are less precise.

4. Generalization

Based on the results of the analysis of the answers to the test, subject S1 was unable to write the conclusion correctly in problem number 2 because there were errors in the calculation steps. This can be seen in S1's answer to question number 2 which is presented in Figure 7 as follows.



d. So, the cost required for seeds and fertilizer = fertilizer - 119.686

Figure 7. The answer to question number 2 by S1 on the Generalization indicator

Figure 7 shows that S1 wrote the conclusion but the results obtained were not correct so that it could not show the ability of mathematical computation on the Generalization indicator, namely concluding important objects from previous problems to solve new problems. This is supported by the following interview excerpt.

Researcher: "Why did you conclude the solution as you wrote?"

S1 : "Because of the results I obtained, sis."

Thus it can be concluded that S1 can show computational thinking skills on generalization indicators, namely concluding problem solving, although with less precise solution results.

Based on data analysis of test results and interviews, it is formulated that both cognitive styles have similarities and differences in computational thinking ability. Presented in Table 5 as follows.

Table 5. Comparison of Computational Thinking Ability of Field Independent and Field Dependent Learning Styles

Indicator	**Field Independent**	**Field Dependent**
Abstract	Students are able to identify the known and asked information from the given problem correctly.	Students are able to identify the known information but are less able to identify the information asked from the given problem correctly.
Pattern Recognition	Students are able to determine the recognition pattern according to the problem.	Students are less able to determine the recognition pattern according to the problem.
Algorithmic Thinking	Students are able to organize the steps of completion and get the right answer	Students are able to compile the steps of completion but there are errors in the calculation operations. Thus, the answer obtained is not correct.
Generalization	Students are able to write the right conclusion from the problem	There is a conclusion, but the results obtained are not correct.

Table 5 shows that all objects can present mathematical concepts from the problems presented. FI subjects can present completely with the concept of Abstraction, while FD subjects tend not to be able to write down information. This is due to the lack of students' level of accuracy in solving the problem and there are calculation errors. The results of this study are in line with research conducted by (Suhatini et al., 2019) who concluded that FI students can explain sequentially and describe the working steps and concepts used fluently, while FD students tend to be able to write down the known data in the problem but, are less fluent in mentioning the known data. Thus, it can be concluded that students' learning style affects students' computational thinking ability on the Generalization indicator.

The pattern recognition indicator shows that all subjects can determine the pattern used. Subjects with FI learning styles can show the patterns used in solving the problems given in the problem. Then for FD can also show the pattern recognition used even though it is not written on the solution sheet. Previous research by (Syukriani et al., 2017) concluded that FI subjects could write the solution plan correctly, while FD FD subjects did not write down the steps used in solving the problem.

Furthermore, in the algorithm thinking indicator all subjects used the steps correctly, but in the FD subject there were calculation errors. This is also in accordance with the results of previous research conducted by (Nuzulia, 2013) concluded that FI students showed significantly greater readiness in concept achievement than FD students. This means that the steps written by FI are more detailed than FD.

In the Generalization indicator, the two subjects both concluded the results obtained, although the results obtained by FD were less precise. Previous research by (Yanti et al., 2022) concluded that FI and FD subjects were able to provide conclusions according to their respective results.

Based on the description above, the computational thinking ability of students has *field independent* and *field dependent* learning styles to fulfill the computational thinking indicators. In line with the results of research that has been done (Purnomo et al., 2017) that the computational thinking ability of students with a *field independent* learning style fulfills more computational thinking indicators than the *field dependent* learning style.

Differences in learning styles can provide differences related to the emergence of indicators of students' computational thinking skills. In students with *field independent* learning style, the indicators of Abstract, pattern recognition, algorithm thinking, and Generalization appear. Furthermore, students with *field dependent* learning styles appear indicators of Abstract, thinking algorithms, and Generalization. The results of this study are supported by research (Masduki & Muyassaroh, 2023) FI and FD subjects use the same way to solve problems up to Generalization. Furthermore, on problems with dynamic thinking types, FI subjects were able to solve the problem correctly by applying the comparison relationship between known quantities in the problem. Conversely, FD subjects failed to understand the information in the problem. Thus, it can be concluded that students with a field independent cognitive style are more active in using computational thinking processes than students with a field dependent cognitive style.

CONCLUSION

Students with cognitive style type field independent able to understand the indicators of computational thinking (Abstract, recognition, thinking algorithms, Generalization), while students with cognitive style field dependent (Abstract, recognition, thinking algorithms, Generalization) namely students who are less able to understand computational thinking. The results showed that there are differences in the process of computational thinking owned by students in solving problems. This research can provide the necessary information for teachers to know the level of understanding of students, so teachers can improve the skills that students have. Thus, the improvement of computational thinking can affect students' ability to solve math problems although this study provides significant information, the subjects involved are limited and the material is in the form of fractional numbers.

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