Prima: Jurnal Pendidikan Matematika
Vol. 10, No. 1, January 2026, pp. 249 - 266
P-ISSN: 2579-9827, E-ISSN: 2580-2216
Web: http://jurnal.umt.ac.id/index.php/prima

PROFILE OF METACOGNITION OF CLASS IX STUDENTS AT SMP NEGERI 19 PALU IN SOLVING STATISTICAL WORD PROBLEMS BASED ON COGNITIVE STYLE

Nurfadilah[1], Alfisyahra[2], Muh Hasbi[3], Mustamin Idris[4]
[1,2,3,4]Universitas Tadulako, Palu, Indonesia
e-mail: nurfadilad173@gmail.com

Abstract

This study aims to describe the metacognition of students with cognitive styles of field independent and field dependent in solving statistical word problems. The research was conducted at SMP Negeri 19 Palu using a descriptive method with a qualitative approach. The subjects of this study were two students from Class IX B, consisting of one student with a field independent cognitive style and one student with a field dependent cognitive style, determined through the Group Embedded Figure Test (GEFT). The data collection techniques used in this study included a cognitive style test, a written test, and interviews, which were then analyzed using the Miles and Huberman model encompassing data condensation, data display, and conclusion drawing. The credibility test of the data employed in this study was participant validation (member check). The results of this study show that students with a field-independent cognitive style are able to fulfill all components of metacognition, which include regulation, planning, strategy, process, evaluation, and goals. Meanwhile, students with a field-dependent cognitive style are able to fulfill only some components of metacognition, which include regulation, planning, strategy, process, and goals.

Keywords: metacognition, cognitive style, word problems

Abstrak

Penelitian ini bertujuan untuk mendeskripsikan metakognisi siswa yang bergaya kognitif *field independent* dan *field dependent* dalam menyelesaikan soal cerita statistika. Penelitian ini dilakukan di SMP Negeri 19 Palu dengan menggunakan metode deskriptif dengan pendekatan kualitatif. Subjek penelitian ini adalah 2 siswa kelas IX B yang terdiri dari satu siswa yang bergaya kognitif field independent dan satu siswa yang bergaya kognitif field dependent yang ditentukan melalui tes *Group Embedded Figure Test* (GEFT). Teknik pengumpulan data yang digunakan dalam penelitian ini antara lain, tes gaya kognitif, tes tertulis, dan wawancara, kemudian dianalisis dengan model Miles dan Huberman yang meliputi kondensasi data, penyajian data, serta penarikan kesimpulan. Uji kredibilitas data yang digunakan dalam penelitian ini adalah validasi partisipan (*member check*). Hasil penelitian ini menunjukkan bahwa siswa yang bergaya kognitif field independent mampu memenuhi seluruh komponen metakognisi, yang meliputi pengaturan, perencanaan, strategi, proses, evaluasi, dan capaian/sasaran. Sedangkan siswa dengan gaya kognitif field dependent mampu memenuhi sebagian komponen metakognisi, yang meliputi pengaturan, perencanaan, strategi, proses, dan capaian/sasaran.

Kata kunci: metakognisi, gaya kognitif, soal cerita

INTRODUCTION

In the school learning process, mathematics is a subject that receives considerable attention. This is due to the fact that many students encounter difficulties in solving mathematical problems, particularly word problems (Dwidarti et al., 2019). Word problems serve as an important tool for assessing students' comprehension of the material studied (Kraeng et al., 2021). They play a crucial role in revealing the extent to which learners understand the concepts taught, especially in mathematics.

Received: November 25, 2025; Revised: December 28, 2025; Accepted: January 12, 2026

One of the word problems that students find difficult to solve is statistical word problems. This occurs because many students struggle to understand how the given data can be processed and analyzed, which requires several stages before reaching a solution. This condition highlights the importance of awareness of the thinking process. Such awareness is known as metacognition.

Metacognition can help students to organize and regulate the way they think when solving problems (Setyaningrum & Mampouw, 2020). Thus, metacognition can serve as a benchmark for students' ability to solve mathematical problems. The ability to solve mathematical problems in various ways is influenced by cognitive style.

Cognitive style is a method employed by an individual in recognizing problems, recalling problems, seeking solutions, and finding solutions. This is further supported by Uji, as cited in Pradiarti & Subanji (2022) who stated that cognitive style is a method by which learners respond to different stimuli and reflect on learning. As a result, cognitive style is considered a link between intelligence and personality.

Cognitive styles consist of Field Independent (FI) and Field Dependent (FD). According to Pradiarti & Subanji (2022) learners with an FI cognitive style are able to observe stimuli without relying on the teacher because they possess a high level of independence. In contrast, learners with an FD cognitive style tend to prefer completing tasks in groups, as they are capable of thinking globally, are interpersonally oriented, and demonstrate strong social skills

Several previous studies have examined students' metacognition in mathematical problem solving and have shown that metacognition plays a significant role in problem solving (Nurhayati & Kusaeri, 2024). Other studies have also discussed FI and FD cognitive styles in students' cognitive processes for solving mathematical problems. However, research that investigates students' metacognition in relation to both field-independent and field-dependent cognitive styles simultaneously, particularly in statistical word problems, remains limited. Moreover, most of these studies have focused on learning outcomes or general problem-solving abilities and have not provided an in-depth description of students' metacognition profiles in solving statistical word problems when, most of these studies have focused on learning outcomes or general problem-solving abilities and have not provided an in-depth description of students' metacognition profiles in solving statistical word problems

when viewed from the viewed from the differences between differences between FI and FD cognitive styles.

Therefore, the novelty of this study lies in the in-depth exploration of students' metacognition profiles in solving statistical word problems, viewed from both FI and FD cognitive styles. This research integrates metacognition profiles and cognitive styles simultaneously and provides a thorough examination of the components of regulation, planning, strategy, process, evaluation, and goals/achievements demonstrated by students.

Based on interviews with the mathematics teacher of Grade IX at SMP Negeri 19 Palu, it was found that students still experience difficulties in solving statistical word problems, particularly in understanding the information provided, determining the steps for solution, as well as monitoring and evaluating their work. This condition indicates the low level of students' metacognitive ability and the differences in cognitive styles that have not been optimally accommodated in learning. Up to now, teachers have not had a clear picture of students' metacognition profiles when viewed from Field Independent (FI) and Field Dependent (FD) cognitive styles. Therefore, it is necessary to profile students' metacognition in solving statistical word problems as a basis for developing more targeted learning strategies. Based on this description, the purpose of the study is to describe the metacognition profiles of Grade IX students at SMP Negeri 19 Palu in solving statistical word problems, viewed from Field Independent (FI) and Field Dependent (FD) cognitive styles.

METHODS

This study employed a descriptive method with a qualitative approach. Qualitative descriptive research is a type of study that produces descriptive data in the form of written or spoken words, which can provide an overview of the subject under investigation. Accordingly, this research aims to describe or provide an illustration of the process of solving statistical word problems, examined based on students' cognitive styles from the perspective of metacognitive components.

This study was conducted at SMPN 19 Palu, located on Jl. Untad 1 Bumi Roviga, Tondo Subdistrict, Mantikulore District, Palu City, Central Sulawesi Province. The research was carried out during the odd semester of the 2025/2026 academic year.

The selection of subjects in this study was carried out with class IX B students who had completed learning on statistical material. Subsequently, one student with a field-independent (FI) cognitive style and one student with a field-dependent (FD) cognitive style were chosen. The limited number of subjects in this study is consistent with the purpose of qualitative research, which focuses on an in-depth exploration of students' metacognitive processes rather than statistical generalization. The analysis of the subjects was conducted intensively through a written metacognition test and in-depth interviews, thereby obtaining a comprehensive understanding of metacognition components. The selection of subjects was based on the results of the Group Embedded Figures Test (GEFT) developed by Witkin

The assessment of GEFT was carried out by assigning a score of 1 for each correct answer and a score of 0 for each incorrect or unanswered item. If a student did not complete the figure within the allotted time, the item was also scored 0. Thus, the final GEFT score that students could obtain ranged from 0 to 18. The categorization of students' cognitive styles in this study refers to the opinion of Kepner and Neimark in Wijaya (2020) namely: Students who score < 10 are categorized as having a field-dependent (FD) cognitive style. Meanwhile, students who score ≥ 10 are categorized as having a field-independent (FI) cognitive style.

Data collection techniques in this study were carried out through the administration of a cognitive style test, a written test, and interviews. The written test consisted of statistical word problems that had to be solved by the research subjects. Prior to administration, the test was validated by selected validators. The test was then given to the research subjects to identify students' metacognition in solving statistical word problems. From these results, a written description of students' metacognition in problem solving was obtained. After the research subjects completed their work, subsequent interviews were conducted through direct meetings between the researcher and the subjects to explore more in-depth information regarding the answers provided. To allow the researcher to review the data repeatedly, the interviews were recorded in audio form during the process.

The credibility test used in this study was participant validity or member check. Member check is the process of verifying the data obtained by the researcher with the data providers (Sugiyono, 2020). This process aims to ensure that the data and meanings interpreted by the researcher are consistent with the participants' understanding, thereby enhancing the credibility of the research findings. Furthermore, the data analysis employed in this study

followed the model proposed by Milles et al. (2014) which consists of three stages: data condensation, data display, and conclusion drawing.

The indicators used in this study refer to the indicators proposed by (Anggraheni et al., 2023), as explained in Table 1.

Table 1. Indicator of metacognition ability

No.	Components Of Metacognition Ability		Indicators
1.	Metakognitive Knowledge	Regulation	Select and write down the information needed to solve the problem
		Planning	Provide an overview of the completion plan
2.	Metacognitive Skills	Strategies	Determine the formula of the strategy used
		prcoess	Solve the problem logically according to the chosen strategy
		Evaluating	Make conclusions according to the problem Recheck the questions given in a different way
		Goal	Solve questions in accordance with the goals to be achieved

RESULTS AND DISCUSSION

In this study, to obtain the research subjects, the researcher administered the GEFT test to Grade IX B students, which was participated in by 25 students. From the test results, two students were selected to become the subjects of this study, consisting of one student with a field-independent (FI) cognitive style and one student with a field-dependent (FD) cognitive style. Based on the analysis of the GEFT test taken by the students, the data obtained are presented in Table 2.

Table 2. Analysis Results Of The GEFT Test Of Grade IXB Student SMPN 19 Palu

Cognitive Style	Total Student
Field Independent (FI)	3
Field Dependent (FD)	22

Table 2 shows that out of 25 students in Grade IX B at SMP Negeri 19 Palu, data were obtained indicating that 3 students had a field-independent (FI) cognitive style and 22 students had a field-dependent (FD) cognitive style. The research subjects were selected based on the students who achieved the highest scores from each cognitive style with equivalent mathematical ability. Furthermore, the researcher discussed with the mathematics teacher to seek consideration in selecting students from each cognitive style. Table 3 presents the data of subjects with field-independent (FI) and field-dependent (FD) cognitive styles.

Table 3. Research Subject

Cognitive Style	Score
Field Independent (FI)	13
Field Dependent (FD)	7

To facilitate understanding of the data presented, the researcher assigned codes: the subject with a “field-independent” cognitive style was given the code FI, the subject with a “field-dependent” cognitive style was given the code FD, and the “researcher” was given the code PN. The last two digits consist of numbers indicating the sequence of conversations in the interview transcript (e.g., 01, 02, 03, ...).

Metacognition Profile of Students with Field Independent (FI) Cognitive Style

1. FI Subjects on Metacognitive Knowledge Indicators in the regulation component

The written test results of the FI student on the indicator of metacognitive knowledge in the regulation component are presented in Figure 1 below.

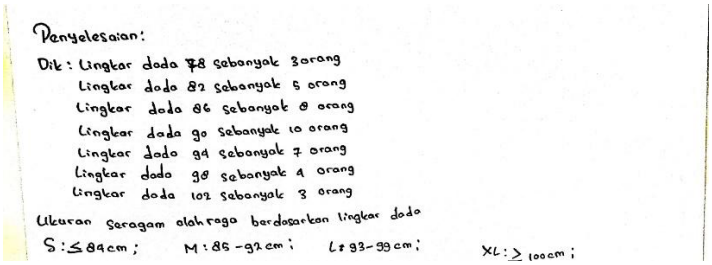

Figure 1. FI’s response to the indicator of the regulation component.

The written test response of the FI student in the figure is also supported by the results of the interview conducted by the researcher with the FI subject, as presented in Table 4 below.

Table 4. Interview with FI Subject on the Regulation Component

		Dialogue
PN04	:	What information did you get from this problem?
FI04	:	Students’ Chest Circumference, Number of Students, and Sports Uniform Size Based on Chest Circumference
PN05	:	Present the data on students’ chest circumference and the number of students from the graph
FI05	:	A chest circumference of 78 cm is owned by 3 students, a chest circumference of 82 cm is owned by 5 students, a chest circumference of 86 cm is owned by 8 students, a chest circumference of 90 cm is owned by 10 students, a chest circumference of 94 cm is owned by 7 students, a chest circumference of 98 cm is owned by 4 students, and a chest circumference of 102 cm is owned by 3 students
PN06	:	Is there still more information obtained?
FI06	:	Yes. Sports uniform size based on chest circumference

Based on the written test answers and interview results, it can be seen that the FI subject was able to identify relevant information in the problem, namely the students’ chest circumference data along with the number of students, presented in a complete manner. In addition, the subject also added that beyond the measurement results of students’ chest

circumference, the next information was the determination of the size of sports uniforms based on the chest circumference. This indicates that the FI subject was able to determine and select relevant information before solving the problem. This finding is consistent with the study conducted by Sutama et al. (2021) which stated that students with an FI cognitive style are able to understand problems well and can determine what information is known and what is being asked in the problem.

2. FI subject on metacognitive knowledge indicators in the planning component

The written test results of the FI student on the indicator of metacognitive knowledge in the planning component are presented in Figure 2 below.

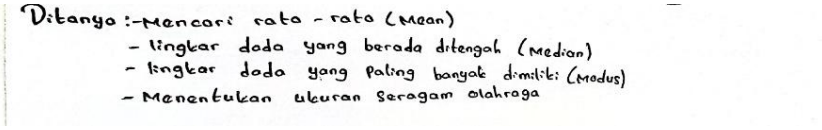

Figure 2. FI's response to the indicator of the planning component

The written test response of the FI student in the figure is also supported by the results of the interview conducted by the researcher with the FI subject, as presented in Table 5 below.

Tabel 5. Interview with FI subject on the planning Component

		Dialogue
PN09	:	What is the actual aim of this problem?
FI09	:	To help Mr. Rudi determine the sports uniform size.
PN10	:	After reading the problem, what plan or idea do you have to solve it?
FI10	:	To calculate the average chest circumference, I use the mean. To determine the chest circumference in the middle, I use the median. And to identify the chest circumference most commonly found among students, I use the mode
PN11	:	Okay. What is the first step you do?
FI11	:	I read the problem. Then, I determine the mean

Based on the interview results, it can be seen that the FI subject was able to identify the purpose of the problem, namely to help Mr. Rudi determine the size of the sports uniform, and explain the initial steps for solving the problem. In addition, the FI subject also provided a clear outline of the plan for solving the problem. This indicates that the FI subject was able to present a general overview or ideas to be used in problem solving. This finding is consistent with the study conducted by Sihotang et al. (2024) which stated that FI subjects, in planning problem solving, are able to provide an outline of what needs to be done to solve the problem.

3. FI subject on metacognitive skills indicators in the strategy component

In this component, the interview results with the FI subject on the strategy component are presented in Table 6.

Tabel 6. Interview with FI subject on the strategy component

		Dialogue
PN13	:	Okay. What formula is applied to determine the mean?
FI13	:	The sum of the data divided by the number of data.
PN17	:	Okay. How do you determine the chest circumference that is in the middle?
FI17	:	I use the median
PN18	:	Can you explain how you do it?
FI18	:	I sort the data first, then I look for the middle value.
PN20	:	Okay. How do you determine the chest circumference that appears the most?
FI20	:	I use the mode
PN21	:	How do you do that?
FI21	:	I see the diagram. The mode is 90 cm with 10 students, since 10 is the largest number of students

Based on the interview results, it was found that the FI subject was able to determine the formulas and strategies to be used, namely by applying the mean formula, which is the sum of the data divided by the number of data points. Then, to determine the chest circumference value located in the middle, the concept of median was used. For the chest circumference most frequently found among students, the mode was applied by referring to the diagram in the problem. Thus, the FI subject fulfilled the strategy component. This finding is consistent with the study conducted by Ismaimuza et al. (2024), which stated that FI students excel in problem comprehension and solution planning, both of which are closely related to the ability to select appropriate problem-solving strategies

4. FI subject on metacognitive skills indicator in the process component

The written test results of the FI student on the indicator of metacognitive knowledge in the planning component are presented in Figure 3 below.

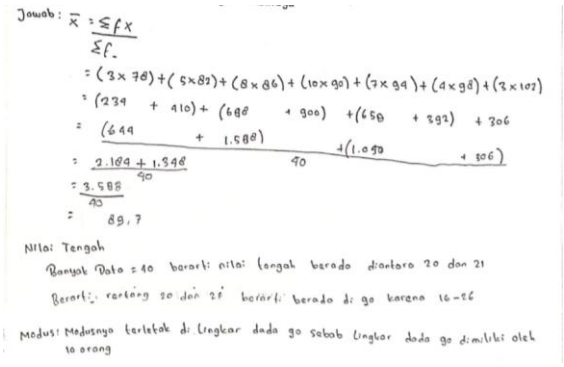

Figure 3. FI's response to the indicator of the process component

The written test response of the FI student in the figure is also supported by the results of the interview conducted by the researcher with the FI subject, as presented in Table 7 below.

Tabel 7. Interview with FI subject on the process component

		Dialogue
PN14	:	Can you explain how to find the mean?
FI14	:	I multiply the chest circumference by the number of students, like 78 × 3, then I add it with the next chest circumference, 82 × 5, and so on. After that, I add them two by two first to make it easier, and continue until the result is 3552. For the total chest circumference, there are 40, obtained from the number of students.
PN15	:	Okay. Then why, in your answer sheet, to determine the mean, did you write divided by 40 at the end?" (while showing the student's answer)
FI15	:	Yes. I worked on the calculation above first.
PN16	:	Okay. How did you get 40?
FI16	:	I counted the number of students one by one from the diagram: 3 + 5 + 8 + 10 + 7 + 4 + 3
FI16	:	I first arrange the data, then I find the middle value.
PN19	:	Can you explain the steps you used to find the median?
FI19	:	I counted the frequencies: data 1–3 is 78 cm, data 4–8 is 82 cm, data 9–16 is 86 cm, data 17–26 is 90 cm, data 27–33 is 94 cm, data 34–37 is 98 cm, and data 38–40 is 102 cm. So the total number of data is 40, which means the middle data are the 20th and 21st. Therefore, the chest circumference in the middle is 90 cm, and its range is 16–26.
PN121	:	How do you do that (to determine the mode)?
FI21	:	I see from the diagram that the mode is 90 cm with 10 students, since 10 is the highest frequency

Based on the written test answers and interview results, it was evident that the FI subject was able to solve the problem according to the chosen strategy. The process began with determining the mean by multiplying the chest circumference by the number of students shown in the diagram. Next, the median was identified by calculating the cumulative frequency; although the subject did not explicitly present the process, they directly wrote down the middle data. However, the subject was able to explain the procedure for obtaining the median value. Subsequently, the FI subject determined the mode by identifying the chest circumference most frequently occurring among the students. Thus, the FI subject fulfilled the strategy component. This finding is consistent with Kurniawan & Kriswandani (2025), who stated that FI subjects are capable of applying the strategies they have planned.

5. FI subject on metacognitive skill indicators in the evalution component

In this component, the interview results with the FI subject on the evalution component are presented in Table 8.

Tabel 8. Interview with FI subject on the evaluasi component

Dialog

PN23	:	Okay. Are you sure of everything you explained just now?
FI23	:	Yes, I'm sure
PN24	:	How do you convince yourself that your answer is correct?
FI24	:	Because I worked on it thoroughly, and I calculated it repeatedly.
PN25	:	Okay. From the problem you have worked on, what conclusion did you get?
FI25	:	My result is a mean of 89.7, the median is 90, and the mode is 90 as well.
PN26	:	Did you include the conclusion you mentioned earlier in your answer sheet?
FI26	:	No, I didn't.
PN27	:	Why didn't you include it?
FI27	:	I forgot.include it

Based on the interview results, it was found that the FI subject was able to draw conclusions from the answers provided. However, the subject did not write these conclusions on the answer sheet due to forgetting, but was able to convey them during the interview. In addition, the subject rechecked the answers by ensuring their accuracy and recalculating several times. Thus, the FI subject fulfilled the evaluation component. This finding is consistent with Silaban & Darhim (2023), who stated that FI subjects are able to formulate conclusions related to their answers and conduct re-examinations of the work they have completed.

6. FI subject on metacognitive skill indicators in the goal component

The written test results of the FI student on the indicator of metacognitive skill in the goal component are presented in Figure 4 below

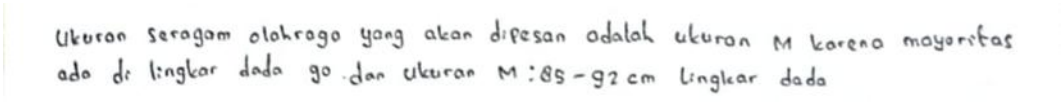

Figure 4. FI's response to the indicator of the goal component

The written test response of the FI student in the figure is also supported by the results of the interview conducted by the researcher with the FI subject, as presented in Table 9 below.

Tabel 9. Interview with FI subject on the goal component

		Dialogue
PN30	:	Okay. So, has the purpose of this problem been achieved?
FI30	:	Yes, it has
PN31	:	What is that?
FI31	:	Because we already know that the uniform size Mr. Rudi should order is M.
PN32	:	Okay. Why does it have to be size M?
FI32	:	Because the majority of students have a chest circumference of 90 cm, which corresponds to size M: 85–92 cm.

Based on the written test answers and interview results, the FI subject was able to determine and respond to the purpose of the problem, namely to assist Mr. Rudi in

determining the size of the sports uniform. The uniform that should be ordered is size M, because this chest circumference represents the majority of the students' measurements. Thus, the FI subject the FI subject fulfilled the goal component.

Metacognition Profile of Students with Field Dependent (FD) Cognitive Style

1. FD Subjects on Metacognitive Knowledge Indicators in the regulation component

The written test results of the FD student on the indicator of metacognitive Knowledge in the goal component are presented in Figure 5 below

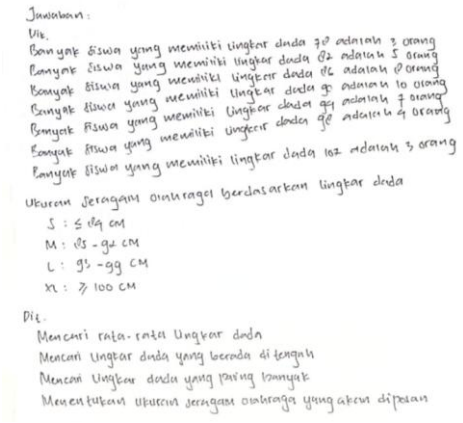

Figure 5. FD's response to the indicator of the regulation component

The written test response of the FD student in the figure is also supported by the results of the interview conducted by the researcher with the FD subject, as presented in Table 10 below.

Tabel 10. Interview with FD subject on the regulation

		Dialog
PN04	:	What information did you get from this problem?
FD04	:	In this problem, we can calculate the average chest circumference, find the chest circumference that is in the middle, identify the most frequent chest circumference, and determine the uniform size to be ordered
PN05	:	Besides that, is there anything else?
FD05	:	Yes. There are the chest circumference and the number of students. There is also the size of the sports uniform based on the chest circumference.
PN06	:	Please explain to me the parts of the chest circumference measurement diagram
FD06	:	There are 3 students with a chest circumference of 78 cm, 5 students with 82 cm, 8 students with 86 cm, 10 students with 90 cm, 7 students with 94 cm, 4 students with 98 cm, and 3 students with 102 cm

Based on the interview results, it was evident that the FD subject was able to select and record the information needed to solve the problem. While reading the problem, the FD subject could identify essential information, such as chest circumference data, the number of students in each category, and the ultimate goal of determining the size of the sports uniform. This was reflected in the subject's response, which systematically and completely presented

the frequency distribution data of chest circumference according to the given diagram. Thus, the FD subject fulfilled the metacognition indicator of the regulation component.

2. FD subject on metacognitive knowledge indicators in the planning component

In this component, the interview results with the FD subject on the planning component are presented in Table 11.

Tabel 11. Interview with FD subject on the planning

		Dialogue
PN07	:	What is actually the purpose of working on this problem?
FD07	:	To determine the mean, median, and mode.
PN08	:	Is that correct?
FD08	:	(after rereading the problem) Oh, it is to help Mr. Rudi determine the size of the sports uniform.
PN09	:	Oh okay. What data is most important to solve this problem?
FD09	:	The chest circumference and the sports uniform size.
PN10	:	Okay. Why?
FD10	:	Because we cannot answer if we don't know those.
PN11	:	After reading the problem, what plan or idea will you use to solve it?
FD11	:	The plan to solve the problem is to first write down the known and asked information. Then, identify the chest circumference and the number of students. After that, calculate the mean, determine the median as the middle value, and find the mode as the most frequent chest circumference
PN12	:	Okay. Then what is the first step you will take?
FD12	:	I write down what is known and what is asked from the problem.

Based on the interview results, it was observed that the FD subject initially made an error in understanding the purpose of the problem, assuming that it was only intended to find the mean, median, and mode. However, after being asked to reread the problem, the FD subject was able to revise this understanding and grasp the actual objective, namely determining the size of the students' sports uniforms. Following this, the FD subject was able to identify relevant data and systematically plan the steps for solving the problem before performing the calculations, similar to the FI subject. This finding is consistent with Syamsuri & Aprilia (2022), who stated that FD subjects are capable of organizing problem-solving plans based on the available information.

3. FD subject on metacognitive skills indicators in the strategy component

In this component, the interview results with the FD subject on the strategy component are presented in Table 12.

Tabel 12. Interview with FD subject on the strategy

		Dialog
PN10	:	Okay. What formula is used to find the mean?

FD10	:	The sum of the data divided by the number of data.
PN14	:	How do you determine the chest circumference that is in the middle?
FD14	:	First, I arrange the data from the smallest to the largest, then I determine the data in the middle. Since there are 40 data points, the median is the 20th and 21st data
PN17	:	Oh okay. Then how do you determine the chest circumference most frequently owned by the students?
FD17	:	I use the mode.
PN18	:	Why is the mode value 90 cm?
FD18	:	Because the chest circumference of 90 cm is the one with the highest number of students

Based on the interview results, it was found that the FD subject was able to determine and explain the appropriate formulas for solving statistical problems. The FD subject mentioned the mean formula, the determination of the median through data ordering and identifying the middle position in an even-numbered dataset, as well as the determination of the mode based on the highest frequency. The selection of these formulas and procedures indicates that the FD subject understands the basic concepts of statistics and is able to determine strategies that are appropriate to the problem's requirements. This finding is consistent with Sihotang et al. (2024), who stated that FD subjects are able to determine strategies effectively when information is presented clearly.

4. FD subject on metacognitive skills indicator in the process component

The written test results of the FD student on the indicator of metacognitive Knowledge in the process component are presented in Figure 6 below

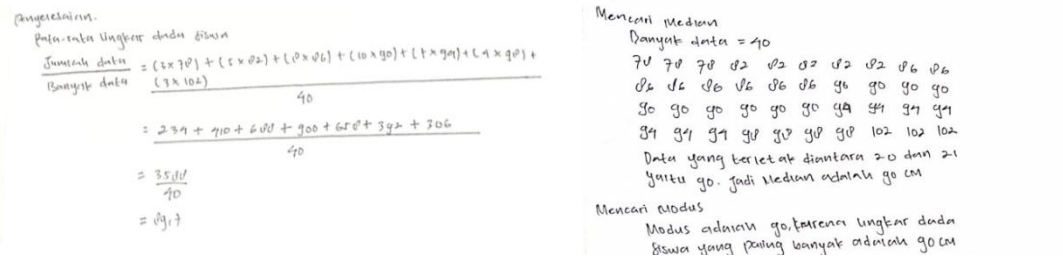

Figure 6. FD's response to the indicator of the process component

The written test response of the FD student in the figure is also supported by the results of the interview conducted by the researcher with the FD subject, as presented in Table 13 below.

Table 13. Interview with FD subject on the process

		Dialogue
PN12	:	Please explain, what is the way to find the mean?
FD12	:	The calculation is carried out by multiplying the frequency of students by their chest circumference, summing all the products, and then dividing the total by the overall number of students. For instance, the first group consists of 3 students with a chest circumference of 78

		cm, which is then added to the subsequent groups until all data are included. The final result is obtained by dividing the total by 40.
PN13	:	Okay. Then where does the number 40 come from?
FD13	:	I added up the number of students.
PN14	:	How do you determine the chest circumference that is in the middle?
FD14	:	The data are first arranged in ascending order. With a total of 40 observations, the median is identified as the 20th and 21st values in the ordered dataset
PN15	:	How are the 20th and 21st data points obtained?
FD15	:	The data are rewritten and listed sequentially from 78 to 102, after which the 20th and 21st values are identified by counting their positions in the ordered dataset
PN16	:	Why do you expand the data one by one?
FD16	:	So it is easier for me to find the median
PN17	:	Oh okay. Then how do you determine the chest circumference most frequently owned by the students?
FD17	:	I use the mode.
PN18	:	So what is the mode value?
FD18	:	90 cm
PN19	:	Why is the mode 90?
FD19	:	Because the chest circumference of 90 cm has the highest number of students.

Based on the written test answers and interview results, it was evident that the FD subject was able to explain the stages of problem solving in detail. The FD subject calculated the mean by multiplying each chest circumference category by the number of students, summing all the results, and then dividing by the total of 40 students. In determining the median, the FD subject ordered the data and presented it again based on frequency to identify the 20th and 21st data positions. Subsequently, the FD subject determined the mode by identifying the chest circumference category with the highest frequency, namely 90 cm, which was the most common among the students. This indicates that the FD subject fulfilled the metacognition indicator of the process component.

5. FD subject on metacognitive skill indicators in the evalution component

In this component, the interview results with the FD subject on the evaluating component are presented in Table 14.

Tabel 14. Interview with FD subject on the evalution

		Dialog
PN22	:	Did you check again the work you have done?
FD22	:	No.
PN23	:	Okay. So are you confident with the answers you have obtained?
FD23	:	Insyaa allah, I am confident.
PN24	:	How do you convince yourself that your answer is correct?
FD24	:	(remains silent)
PN25	:	Okay. What conclusion did you get?
FD25	:	I obtained the results for the mean, median, and mode
PN26	:	What are the results?
FD26	:	The mean is 89.7, the median is 90 cm, and the mode is also 90 cm.
PN27	:	Did you write the conclusion on your answer sheet?
FD27	:	No.

PN28	:	Why didn't you include it?
FD28	:	I thought it wasn't necessary.

Based on the interview results, the FD subject stated that they did not recheck their answers, although they felt confident about the results obtained. The FD subject was able to verbally state the final answer but did not write it on the answer sheet, considering it unnecessary. This indicates that the FD subject had not fully carried out an evaluation of the process and the results of problem solving. This finding is consistent with Nilamsari & Astutik (2021), who reported that FD subjects tend not to recheck their work and do not include conclusions in problem solving.

6. FD subject on metacognitive skill indicators in the goal component

The written test results of the FD student on the indicator of metacognitive Knowledge in the goal component are presented in Figure 7 below

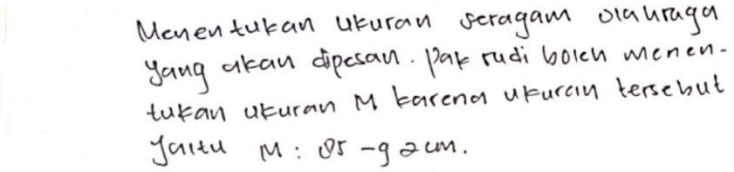

Figure 6. FD's response to the indicator of the goal component

The written test response of the FD student in the figure is also supported by the results of the interview conducted by the researcher with the FD subject, as presented in Table 15 below.

Tabel 15. Interview with FD subject on the goal

		Dialog
PN30	:	For the purpose of this problem, has it been achieved?
FD30	:	It has been achieved
PN31	:	What is that?
FD31	:	FD31: Mr. Rudi can determine size M for the sports uniform.
PN32	:	Why size M?
FD32	:	FD32: Because the chest circumference at that size, 90 cm, is the most common among the students, so it corresponds to size M.

Based on the written test answers and interview results, it can be seen that in the achievement/goal component, the FD subject was able to understand the purpose of the problem, namely determining the appropriate size of the sports uniform to be ordered by Mr. Rudi. In the written answer, the FD subject chose size M, and this was reinforced during the interview. The FD subject stated that the goal had been achieved and explained that size M was chosen because the chest circumference most commonly found was 90 cm, which falls

into the M size category. This indicates that the FD subject fulfilled the achievement/goal component.

CONCLUSION

This study shows that Field Independent (FI) students demonstrate greater independence and stronger analytical abilities, and are able to fulfill all components of metacognition, which include regulation, planning, strategy, process, evaluation, and goal. This is reflected in their ability to selectively organize information, plan, determine, and logically carry out problem solving, as well as apply strategies aligned with the objectives. Although FI students do not always explicitly write down the entire process or conclusions on the answer sheet, interview results indicate that they are still able to evaluate their work and articulate conclusions. In contrast, Field Dependent (FD) students tend to rely on the given problem structure and are able to fulfill only part of the metacognition components, namely regulation, planning, strategy, process, and goal. FD students have not yet been able to fulfill the evaluation component due to limited rechecking activities and the inability to consistently connect calculation results with the main objective of the problem.

ACKNOWLEDGMENTS

The author expresses gratitude to the supervising lecturer and the validating lecturer for their suggestions, input, and motivation, which enabled this research to be successfully completed. The author also conveys deep appreciation to myself, my father and mother, beloved family, dear friends, and classmates from Class D for their prayers, motivation, support, and continuous encouragement, which became a source of strength and inspiration in completing this article. Special thanks are also extended to the principal, mathematics teacher, and students of SMP Negeri 19 Palu for their cooperation and willingness to participate in this research.

REFERENCES

Anggraheni, F. Y., Kismianti, & Wijaya, A. (2023). Analysis of metacognition ability to solve mathematics problem. *Southeast Asia Mathematics Education Journal*, *13*(1), 19–30. https://doi.org /10.46517/seamej/v13i1.183

Dwidarti, U., Mampouw, H. L., & Setyadi, D. (2019). Analisis kesulitan siswa dalam menyelesaikan soal cerita pada materi himpunan. *Jurnal Cendekia: Jurnal Pendidikan*

Matematika, *3*(2), 315–322. https://doi.org/10.31004/cendekia.v3i2.110

Ismaimuza, D., Lefrida, R., Silvana, & Baiduri. (2024). Mathematical communication of vocational students with field dependent and independent cognitive styles in solving linear programming problems. *Jurnal of Hunan University*, *51*(8). https://doi.org/10.55463/issn.1674-2974.51.8.1

Kraeng, Y. F., Rahaju, & Murniasih, T. R. (2021). Analisis kesulitan siswa dalam menyelesaikan soal cerita pada materi statistika. *Jurnal Ilmiah Pendidikan Matematika Al Qalasadi*, *5*(1), 72–80. https://doi.org/10.32505/qalasadi.v5i1.2366

Kurniawan, A. W., & Kriswandani. (2025). Analisis keterampilan metakognitif siswa dalam menyelesaikan masalah SPLDV ditinjau dari gaya kognitif. *Jurnal Pendidikan Dan Pembelajaran Matematika*, *11*(2), 1444–1458. http://jurnal.stkippgritulungagung.ac.id/index.php/jp2m

Milles, M. B., Huberman, A. M., & Saldana, J. (2014). Qualitative Data Analysis : A Methods Sourcebook. In *Sustainability (Switzerland)* (3rd ed., Vol. 11, Issue 1). SAGE Publications, Inc.

Nilamsari, N., & Astutik, E. P. (2021). Proses berpikir siswa dalam memecahkan masalah matematika materi SPLDV ditinjau dari gaya kognitif field dependent. *FIBONACCI Jurnal Pendidikan Matematika Dan Matematika*, 37–44. https://doi.org/10.24853/fbc.7.1.37-44

Nurhayati, & Kusaeri, A. (2024). Analisis kemampuan metakognisi siswa dalam pemecahan masalah matematika berbasis etnomatematika uma lengge. *Kognitif: Jurnal Riset HOTS Pendidikan Matematika*, *4*(1), 430–441. https://doi.org/10.51574/kognitif.v4i1.1545

Pradiarti, R. A., & Subanji. (2022). Kemampuan pemecahan masalah matematis siswa SMP ditinjau dari gaya kognitif. *Mosharafa: Jurnal Pendidikan Matematika*, *11*(3), 379-3https://doi.org/https://doi.org/10.31980/mosharafa.v11i3.729

Setyaningrum, D. U., & Mampouw, H. L. (2020). Proses metakognisi siswa SMP dalam pemecahan masalah perbandingan senilai dan berbalik nilai. *Mosharafa: Jurnal Pendidikan Matematika*, *9*(2), 275–286. https://doi.org/10.31980/mosharafa.v9i2.610

Sihotang, M. R., Huda, N., & Novferma. (2024). Metacognition analysis in problem solving of field independent and field dependent students. *Research of Mathematics and Mathematics Education*, *6*(3), 325–334. https://doi.org/10.38114/reimann.v6i3.48

Silaban, B., & Darhim, D. (2023). Kemampuan metakognisi siswa berdasarkan gaya kognitif dalam menyelesaikan soal pisa. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *7*(2), 1496–1507. https://doi.org/10.31004/cendekia.v7i2.2242

Sugiyono, P. D. (2020). *Metode Penelitian Kuantitatif Kualitatif dan R & D* (Supoto (ed.); ke 2). Anyflip. https://anyflip.com/xobw/rfpq/basic

Sutama, Anif, S., Prayitno, H. J., Narimo, S., Fuadi, D., Sari, D. P., & Adnan, M. (2021). Metacognition of junior high school students in mathematics problem solving based on cognitive style. *Asian Journal of University Education (AJUE)*. https://doi.org/10.24191/ajue.v17i1.12604

Syamsuri, & Aprilia, M. (2022). Kemampuan metakognitif siswa SMK dengan gaya kognitif field dependent dalam menyelesaikan masalah materi program linier. *Jurnal Education*, *8*(3), 863–872. https://doi.org/10.31949/educatio.v8i3.2573

Wijaya, A. P. (2020). Gaya kognitif field dependent dan tingkat pemahaman konsep matematis antara pembelajaran langsung dan STAD. *Jurnal Derivat: Jurnal Matematika Dan Pendidikan Matematika*, *3*(2), 1–16. https://doi.org/10.31316/j.derivat.v3i2.713