



Math-Oriented Critical Thinking Skills of Elementary School Students Viewed from Cognitive Style

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Abstract: The tendency to develop critical thinking skills has been carried out for a long time starting from the definition, indicators of mathematical critical thinking, and the practice of developing critical thinking. Critical thinking can be developed both individually and classically through learning. The purpose of this study was to analyze qualitatively the mathematical critical thinking process of SD Muhammadiyah Manyar students in terms of cognitive style. The research method is descriptive qualitative. The results of the analysis obtained students with FD cognitive style more than students with FI cognitive style. From the difference in numbers, it is in line with the analysis of the learning process where students need more teacher instruction in completing assignments. In addition, from the analysis of critical thinking aspects according to Facione (2013) of the 6 existing aspects there are 2 aspects that have not been achieved by students, namely explanation and self-regulation.

Keywords: critical thinking skills, cognitive style, elementary school.

Abstrak: Kecenderungan mengembangkan kemampuan berpikir kritis telah dilakukan sejak lama mulai dari definisi, indikator berpikir kritis matematis, dan praktik mengembangkan berpikir kritis. Berpikir kritis dapat dikembangkan baik secara individual maupun klasikal melalui pembelajaran. Tujuan penelitian ini adalah untuk menganalisis secara kualitatif proses berpikir kritis matematis siswa SD Muhammadiyah Manyar ditinjau dari gaya kognitif. Metode penelitian yang digunakan adalah deskriptif kualitatif. Hasil analisis diperoleh siswa dengan gaya kognitif FD lebih banyak dibandingkan siswa dengan gaya kognitif FI. Dari selisih angka tersebut sejalan dengan analisis proses pembelajaran dimana siswa lebih membutuhkan arahan guru dalam menyelesaikan tugas. Selain itu dari analisis aspek berpikir kritis menurut Facione (2013) dari 6 aspek yang ada terdapat 2 aspek yang belum dicapai siswa yaitu eksplanasi dan regulasi diri.

Kata kunci: keterampilan berpikir kritis, gaya kognitif, sekolah dasar.

▪ INTRODUCTION

Learning at 21st century emphasizes 4 competencies that must be possessed by students. One of these competencies is critical thinking. The formation of critical thinking skills by developing creativity, curiosity, the ability to formulate questions is one of the competencies that exist in the 2013 curriculum (Permendikbud, 2013). In line with this, various stakeholders or stakeholders in education, such as policy makers, educators, and entrepreneurs have considered the development of critical thinking as an important outcome of education (Association of American Colleges and Universities, 2005; Lin, 2014; National Research Council, 2005). 1996; Pascarella & Terenzini, 2005).

In the field of mathematics, the tendency to develop critical thinking skills has been carried out for a long time starting from the definition, indicators of mathematical critical thinking, and the practice of developing critical thinking. The first view is given of critical thinking as reflective and reasonable thinking that focuses on deciding what to believe or do (Ennis, 1985). Critical thinking is the ability to apply reasoning and logic to unfamiliar

or new ideas, opinions, and situations (Broadbear & Keyser, 2000). Critical thinking helps individuals see things from an open-minded perspective and examine ideas or concepts from as many points of view as possible (Broadbear & Keyser, 2000). Meanwhile, de Paul (2009), who views it as "disciplined and directed thinking that shows the perfection of thinking in accordance with certain modes or domains of thought".

Critical thinking can be developed both individually and classically through learning. Educational practice is very important for the development of critical thinking. Individuals who experience the development of critical thinking, they are able to distinguish problems in everyday life, and are able to evaluate opinions and results. Critical thinking is a decision-making mechanism that helps the person organize their ideas as well (Facione, 2011). To develop critical thinking through education, individuals must have the opportunity to observe and apply critical thinking in the classroom (Akbiyık & Seferoğlu, 2006; ten Dam & Volman, 2004).

Table 1. Aspects of critical thinking described by Facione (2013)

Aspects	Description
Interpretation	The ability to understand and know the meaning or intent of a variety of experiences, situations, data, events, decisions, conventions, beliefs, rules, procedures, or criteria.
Analysis	Ability to identify precise intentions and relationships between statements, questions, concepts, descriptions, or other forms of questions to express beliefs, decisions, experiences, reasons, information, or opinions
Evaluation	The ability to judge the credibility of a statement or other presentation by assessing or describing a person's perception, experience, situation, decision, belief, or opinion; and to assess the logical strength of inferential relationships between statements, descriptions, questions, or other representations.
Inference	Ability to identify and select the elements needed to make reasonable conclusions; to make reasonable hypotheses; to pay attention to relevant information and reduce the consequences arising from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other presentations.
Explanation	The ability to state the results of one's process, the ability to justify a reason based on evidence, concepts, methodologies, criteria, and certain reasonable criteria; and to explain someone's reasons with convincing arguments.
Self-regulation	A person's awareness to monitor his own activities, the elements used and the results developed by applying the ability to analyze and evaluate one's own ability to make decisions in the form of questions, confirmations, validations, or corrections.

The difference in the characteristics of students' cognitive styles is a characteristic difference from within students in processing the amount of information they receive. Cognitive style can be viewed as a variable in learning. In this case, cognitive style is a variable characteristic of students and is internal. Cognitive style is a typical student way of learning, both related to the way of receiving and processing information, attitudes

towards information and habits related to the learning environment (Uno, 2006). Therefore, cognitive style will also affect student learning outcomes.

Some experts also provide definitions of different cognitive styles. However, it has similarities from the given definition. For example, Broverman (1960) stated that cognitive style provides an overview of the way a person understands his environment. Balter (1973) suggests cognitive style as a variation of the way individuals receive, remember and think about information or different ways of understanding, storing, transforming and utilizing information. Coop (1974) stated that the term cognitive style refers to the consistent patterning (patterning) that a person displays in responding to various types of situations and also refers to an intellectual approach and or strategy in solving problems. Thomas (1990) suggests that cognitive style refers to a person processing information and using strategies to respond to a task. And Woolfook (1993) states that cognitive style is how a person receives and organizes information from the world around him.

Cognitive style has the following characteristics: (1). Cognitive style is a dimension that can enter (pervasive dimension) into all behavior, both cognitive aspects and affective aspects. The pervasive nature of cognitive style means that cognitive style can be assessed by "non-verbal" (perceptual) methods. (2). Cognitive style is stable over time. Because of the stability of this cognitive style, it can be used optimally by teachers in learning that pays attention to cognitive styles. (3). Cognitive style is bipolar. These characteristics are able to distinguish cognitive style with intelligence and other dimensions of ability (ability). In contrast to intelligence and ability (ability) which can be determined which is better when compared. In terms of cognitive style, it cannot be said that someone who scores higher on the cognitive style test is better in every situation than someone who has a lower score on the cognitive style test.

Cognitive style is divided into two, namely field independence (FI) and field dependence (FD). Witkin & Goodenough (1981) claim that individuals with field independence depend on an internal frame of reference, while individuals with field dependence depend on an external frame of reference. These differences are reflected in the cognitive restructuring skills used by students with field dependence/field independence. In addition, they have identified three separate, but related skills in cognitive restructuring (i) providing a structure for ambiguous stimulus complexes, (ii) breaking down an organized field into its basic elements, and (iii) providing a different organization for a field than for a field. suggested by the inherent structure of the stimulus complex.

Witkin et al. (1977) have shown that the field dependence/field independence cognitive style continuum influences preferences for, and responses to, different types of teaching/learning methods. The characteristics of field independence and field dependence students are described as follows: 1) Individuals with field dependence have a preference for learning in groups and often interact with each other and with teachers. Meanwhile, individuals with field independence can respond better to a more independent and more individual approach. 2) Field independent individuals are more likely to have self-determined goals and to respond to intrinsic reinforcement, while field dependent individuals need more extrinsic reinforcement and more structured work by the teacher. 3) Field independent individuals prefer to structure their own learning, and like to develop their own learning strategies, in contrast to field dependent individuals may need more help with problem solving strategies or a more precise definition of performance outcomes. 4) Individuals who are field dependent are better able to deal with situations

that require impersonal analysis while individuals who are field dependent are more prepared to deal with situations that require social sensitivity and interpersonal skills (Witkin, et al. 1977). The purpose of this study was to analyze the critical thinking process of primary school students at SD Muhammadiyah Manyar by looking at the distribution of existing cognitive styles.

▪ **METHOD**

The subjects in this study were 4th grade students of Muhammadiyah Manyar Elementary School as many as 71 students who were divided into 3 classes. The research design used is qualitative descriptive. In this article, several samples are described that represent students who have the cognitive styles of FI and FD. The instrument used is (a) Given the Group Embedded Figure Test (GEFT) adapted from Witkin (1977), to get data on cognitive styles owned by 4th grade students at Muhammadiyah Manyar Elementary School, (b) Critical thinking ability test validated by experts, namely lecturers and teachers at Muhammadiyah Manyar Elementary School. The problem in the instrument given refers to the material in the 4th grade at Muhammadiyah Manyar Elementary School, (c) Observation sheet either in person or the result of the recording. Observation sheets are used to observe the activities of learners in learning.

The results of the instrument are analyzed as follows: (a) The results of charging learners on the GEFT test which is analyzed in the following ways: This GEFT assessment is used to determine field dependent and field independent cognitive styles. GEFT of 25 questions (7 questions about part 1 as an exercise, 9 questions part 2 and 9 question part 3 as cognitive style tests in which The correct answer get one point and zero for the wrong answer.

Table 2. Criteria for cognitive style

Score (s)	Type of Cognitif Style
$0 \leq s \leq 9$	Field dependent
$9 \leq s \leq 18$	Field independent

Subjects with Field Dependent Cognitive Style are coded FD and Field Independent Cognitive Style are coded FI. The results of the work of learners for the critical thinking skills test are analyzed by looking at the critical thinking indicators used. Furthermore, the results are triangulated with the results of observations of learning and interviews.

▪ **RESULT AND DISSCUSSION**

The results of research conducted at SD Muhammadiyah Manyar Gresik on 71 students divided into 3 classes with details of class 4-Sansiviera as many as 23 students, class 4-Anthurium as many as 23 students, and class 4-Aglonema as many as 25 students, are presented in Table 2-4 below.

Table 2. Sansiviera class geft test results

No	Name	Class	Part 1	Part 2	part 3	Result	Conclusion
1	AA	4-Sansiviera	7	3	6	9	FD
2	ADFF	4-Sansiviera	7	3	2	5	FD
3	AHR	4-Sansiviera	6	2	3	5	FD

4	AFG	4-Sansiviera	6	5	8	13	FI
5	AMD	4-Sansiviera	7	3	7	10	FI
6	ASD	4-Sansiviera	7	1	2	3	FD
7	DBA	4-Sansiviera	7	4	0	4	FD
8	FAC	4-Sansiviera	6	3	8	11	FI
9	YDP	4-Sansiviera	2	0	1	1	FD
10	GAY	4-Sansiviera	5	1	4	5	FD
11	IKM	4-Sansiviera	7	2	2	4	FD
12	WAL	4-Sansiviera	5	0	0	0	FD
13	MPW	4-Sansiviera	7	0	0	0	FD
14	MAU	4-Sansiviera	7	1	2	3	FD
15	MKWA	4-Sansiviera	6	1	0	1	FD
16	MAI	4-Sansiviera	5	1	3	4	FD
17	ANAK	4-Sansiviera	7	2	2	4	FD
18	RAG	4-Sansiviera	4	1	1	2	FD
19	SPRE	4-Sansiviera	4	1	1	2	FD
20	SN	4-Sansiviera	0	0	0	0	FD
21	ZRT	4-Sansiviera	7	5	7	12	FI
22	ZHB	4-Sansiviera	6	3	3	6	FD
23	AL	4-Sansiviera	3	1	1	2	FD

Table 3. Anthurium class geft test results

No	Name	Class	Part 1	Part 2	part 3	Result	Conclusion
1	AZR	4-Anthurium	7	3	7	10	FI
2	AG	4-Anthurium	7	3	1	4	FD
3	AKZ	4-Anthurium	7	3	4	7	FD
4	AAT	4-Anthurium	7	3	4	7	FD
5	BWTS	4-Anthurium	7	3	3	6	FD
6	AMZ	4-Anthurium	6	7	7	14	FI
7	AAZ	4-Anthurium	7	2	1	3	FD
8	BRAF	4-Anthurium	7	9	9	18	FI
9	DRAS	4-Anthurium	7	4	3	7	FD
10	DAS	4-Anthurium	7	5	8	13	FI
11	FRA	4-Anthurium	7	3	3	6	FD
12	IAW	4-Anthurium	1	0	0	0	FD
13	IEZS	4-Anthurium	7	3	1	4	FD
14	IM	4-Anthurium	7	6	3	9	FD
15	RNP	4-Anthurium	7	3	3	6	FD
16	MAND	4-Anthurium	7	1	1	2	FD
17	MAA	4-Anthurium	7	4	4	8	FD
18	MFA	4-Anthurium	7	1	3	4	FD
19	NYF	4-Anthurium	7	5	3	8	FD
20	NAS	4-Anthurium	7	3	3	6	FD
21	NDI	4-Anthurium	7	6	5	11	FI

22	SAR	4-Anthurium	7	1	1	2	FD
23	ZAZ	4-Anthurium	7	4	2	6	FD

Table 4. Aglonema class geft test results

No	Name	Class	Part 1	Part 2	part 3	Result	Conclusion
1	AAS	4-Aglonema	7	4	5	9	FD
2	AFF	4-Aglonema	3	0	0	0	FD
3	AAZM	4-Aglonema	7	4	1	5	FD
4	AR	4-Aglonema	7	1	1	2	FD
5	AKR	4-Aglonema	7	0	0	0	FD
6	BBF	4-Aglonema	7	5	6	11	FI
7	DH	4-Aglonema	7	0	2	2	FD
8	IBS	4-Aglonema	5	2	2	4	FD
9	KIAJ	4-Aglonema	0	1	2	3	FD
10	KRZ	4-Aglonema	7	4	4	8	FD
11	KAU	4-Aglonema	7	1	4	5	FD
12	MAAK	4-Aglonema	7	4	2	6	FD
13	MFH	4-Aglonema	7	3	7	10	FI
14	MFDK	4-Aglonema	7	0	1	1	FD
15	MAFF	4-Aglonema	7	1	0	1	FD
16	MFAK	4-Aglonema	7	5	2	7	FD
17	MNA	4-Aglonema	7	8	9	17	FI
18	NFS	4-Aglonema	0	1	0	1	FD
19	NFS	4-Aglonema	7	4	8	12	FI
20	RKR	4-Aglonema	7	8	9	17	FI
21	RDP	4-Aglonema	7	3	1	4	FD
22	NAN	4-Aglonema	0	0	0	0	FD
23	SFU	4-Aglonema	7	1	1	2	FD
24	SVOZ	4-Aglonema	7	0	3	3	FD
25	RFS	4-Aglonema	6	7	5	12	FI

From the table, it can be concluded that there are more students who have field dependence cognitive style than students who have field independence cognitive style. After conducting a cognitive style test, further observations were made on students in learning. The results of the documentation are presented in the following figure:

**Figure 1.** FI students answer the teacher's questions

Students who are marked are students who have a field independence cognitive style. In the learning process, students quickly respond to questions given by the teacher without discussing with other friends. This is in accordance with what was conveyed by Witkin, et al (1977) regarding the individual characteristics of field independence.



Figure 2. FD students (marked blue) asking FI students (marked orange)


From figure 2, it can be seen that students who have FD cognitive style try to communicate with students who have FI cognitive style before answering questions. This shows that in accordance with what was found by Witkin, et al (1977) that individuals who have a field dependence cognitive style have a preference for working in groups. Overall, it can be seen in the learning process that FI students are more confident in themselves without waiting for teacher assistance or instructions. In contrast to FD students who ask more questions and wait for instructions by the teacher in completing their assignments.

The next step is to know the students' critical thinking ability in solving numeracy literacy problems. The question of numeracy literacy is taken based on information that schools implement literacy in accordance with government programs. Numerical skills are one of the determinants of the progress of a nation (Kemdikbud, 2017). Numerical literacy is the knowledge and ability to (a) use a variety of numbers and symbols related to basic mathematics to solve practical problems in various contexts of everyday life and (b) analyze information presented in various forms (graphs, tables), charts, etc.) then use the interpretation of the results of the analysis to predict and make decisions. Several components of numeracy literacy in the mathematics coverage of the 2013 curriculum are estimating and calculating integers and using fractions, decimals, percents and comparisons (Kemdikbud, 2017).

Numerical literacy is practical (used in everyday life), civic-related (understanding issues in the community), professional (in work), recreational (e.g., understanding scores in sports and games), and cultural (as part of deep knowledge and civilized human culture). From this we can see that the scope of numeracy literacy is very broad, not only in mathematics, but also intersects with other literacy, for example, cultural literacy and citizenship (Kemdikbud, 2017). On this basis, the researcher conducted an initial data analysis in the form of questions as shown in Figure 3 below.

Soal berpikir kritis pada Literasi Numerasi

Pemilihan Ketua Kelas



Tahun Pelajaran baru saja dimulai. Masing-masing siswa telah ditentukan pembagian kelasnya. Begitu juga kelas 4A yang dulunya adalah siswa kelas 3A yang berjumlah 45 anak. Jumlah Kelas 4A tahun ini bertambah karena ada satu siswa pindahan dari kota. Seperti biasanya, di awal masuk sekolah, Ustadzah meminta siswa untuk memilih satu anak yang dijadikan sebagai ketua kelas. Betapa bersyukur Ustadzah melihat banyak siswa yang mengajukan diri untuk menjadi ketua kelas 4A. Untuk itu, ustadzah meminta 3 anak untuk menjadi panitia pemilihan. Kemudian ustadzah memberitahukan aturan yang dipakai dalam pemilihan tersebut.

- Setiap siswa berhak mencalonkan diri menjadi calon ketua kelas
- Siswa yang menjadi panitia, tidak boleh mengikuti pemilihan ketua kelas.
- Pemilihan akan dilakukan dalam 2 (dua) tahap jika calon ketua kelas berjumlah minimal 10% dari jumlah siswa di kelas 4A
- Calon ketua kelas yang bisa mengikuti tahap selanjutnya adalah yang memperoleh 35% suara dari jumlah siswa di kelas 4A.
- Calon ketua kelas terpilih adalah calon yang memperoleh suara terbanyak.

Jika kamu menjadi panitia pemilihan ketua kelas 4A. Hitunglah

- Berapa jumlah seluruh siswa kelas 4A yang berhak mencalonkan diri menjadi calon ketua kelas?
- Berapa banyak calon ketua kelas jika dilakukan dalam 2 tahap?
- Jika dilakukan dalam 2 (dua) tahap, berapa calon ketua yang akan lolos ke tahap selanjutnya?
- Jika pada hari pemilihan, ada 3 siswa yang tidak masuk sekolah, Berapa banyak siswa yang telah mengikuti pemilihan itu?

Figure 3. Critical thinking problems

Diketahui: kuantitas kelas 3A yg ber jumlah 45 anak
 kuantitas kelas 4A berjumlah 45 + 1 = 46
 3 anak untuk menjadi panitia

4 Ditanya:

- Jumlah siswa 4A yg calon?
- berapa calon tahap dua?
- Berapa yg lolos ke tahap selanjutnya?
- Banyak siswa jika 3 siswa tidak masuk?

Jawab:

- 46
- $46 - 3 = 43$ anak
- $10\% \times 46$

$$\frac{10}{100} \times 46 = \frac{10}{100} \times 46 = 4,6 \Rightarrow 5 \text{ anak calon tahap dua}$$

- $35\% \times 46 = \frac{35}{100} \times 46 = \frac{1610}{100} = 16,1$
- 40
- $46 - 3 = 43 - 3 = 40$

(i)

Diketahui:

Siswa 3A = 45 anak
 jumlah siswa 4A = 45 + 1 = 46
 Panitia = 3 anak

Ditanya:

- berapa siswa 4A yang calon ketua kelas?
 jumlah 46 - 3 = 43 siswa calon ketua kelas
- berapa calon dalam 2 tahap?
 $10\% \times 46 =$

$$\frac{10}{100} \times 46 = \frac{460}{100} = \frac{46}{10} = 4,6$$

Jadi banyak calon 5 anak

- berapa banyak tahap selanjutnya?
 $35\% \times 46 = \frac{35}{100} \times 46 = \frac{1610}{100} = 16,1$

Jadi banyak calon ke tahap selanjutnya 16 siswa

- 3 siswa tdk masuk sekolah berapa jumlah
 $43 - 3 = 40$ siswa yang ikut pemilihan calon ketua kelas

(ii)

Dik: Jumlah siswa kelas 4A adalah 46 anak, 3 anak menjadi panitia pemilihan, pemilihan dilakukan dalam 2 tahap jika calon ketua kelas berjumlah min 10% dan jumlah siswa yang bisa mengikuti tahap selanjutnya adalah yang memperoleh 35% suara.

Dit: Berapa siswa yang berhak mencalonkan?
 2) berapa banyak calon ketua kelas jika dilakukan dalam 2 tahap?
 3) jika dilakukan dalam 2 tahap berapa calon ketua yang akan lolos ke tahap selanjutnya?
 4) jika pada hari pemilihan, ada 3 siswa yang tidak masuk sekolah berapa banyak siswa yang mengikuti pemilihan itu?

Jwb:

- 46 anak karena 3 anak yang lainnya menjadi panitia
- $46 \times \frac{10}{100} = 4,6$ (sekitar 4,5 anak)
- jika syaratnya harus memperoleh 35% dari jumlah siswa maka siswa yang berhasil lolos sebanyak 2
- $46 - 3 = 43$ anak

(iii)

- Siswa asal ada 45 anak + menjadi 46 siswa
 Siswa pindahan ada 1 anak - 3 karena menjadi panitia
 anak yg berhak menjadi ketua kelas adalah 43 siswa
- 10% dari 43 siswa = $\frac{10}{100} \times 43 = \frac{430}{100} = 4,3$
- 4 siswa.
- 40 siswa.

(iv)

Figure 4. Various of students' answers on the critical thinking problems

Questions are given to 4th grade students at the elementary school level. The results of the analysis obtained from giving the questions are the various answers and ways to answer the instrument (see Figure 4). This supports the results of the cognitive style test which shows that there are differences in the cognitive styles of students. Looking more deeply in the context of critical thinking, it was found that there were errors in drawing conclusions based on the identification of contents, namely there should be 46 students but 45 students answered. In the evaluation, it was found that the process is correct but wrong in the final conclusion (see Figure 5).

Handwritten calculation: $3. 35\% \times 46 = \frac{35}{100} \times \frac{46}{1} = 1.6100 = \frac{16.10}{1} = 16 \text{ calon}$

Figure 5. Findings on evaluation activities

In more detail, seen from the aspects of critical thinking according to Facione (2013: 5), there are 6 aspects, namely: interpretation (interpretation), analysis (analysis), evaluation (evaluation), inference (conclusion), explanation (explanation), and self-regulation (self-regulation). To make it clearer, it will be presented in table 5 as follows:

Table 5. Aspects of critical thinking & Analysis

Aspects	Explanations	Analysis Result
Interpretation	The ability to understand and know the meaning or intent of a variety of experiences, situations, data, events, decisions, conventions, beliefs, rules, procedures, or criteria.	It was found that subject (iii) had different answers from other subjects.
Analysis	Ability to identify precise intentions and relationships between statements, questions, concepts, descriptions, or other forms of questions to express beliefs, decisions, experiences, reasons, information, or opinions	Found in subject (iv) which has an incorrect answer to the second question. But able to identify the intent and concept used.
Evaluation	The ability to judge the credibility of a statement or other presentation by assessing or describing a person's perception, experience, situation, decision, belief, or opinion; and to assess the logical strength of inferential relationships between statements, descriptions, questions, or other representations.	It was found that the subject (iii) was less precise in giving the perception of the fourth question.
Inference	Ability to identify and select the elements needed to make reasonable conclusions; to make reasonable hypotheses; to pay attention to relevant information and reduce the consequences arising from data, statements, principles, evidence, judgments, beliefs, opinions, concepts,	It was found that the subject (iii) was less precise in making conclusions on questions 1 and 4.

	descriptions, questions, or other presentations.	
Explanation	The ability to state the results of one's process, the ability to justify a reason based on evidence, concepts, methodologies, criteria, and certain reasonable criteria; and to explain someone's reasons with convincing arguments.	Both FI students and FD students still need help or teacher instructions in order to get the right argument.
Self-regulation	A person's awareness to monitor his own activities, the elements used and the results developed by applying the ability to analyze and evaluate one's own ability to make decisions in the form of questions, confirmations, validations, or corrections.	Because they are still at the elementary school level, both FI students and FD students do not yet have self-reinforcement independently, meaning that they need teachers to monitor activities in analyzing and evaluating self-ability.

▪ CONCLUSION

From the results of the analysis showed the diversity of characteristics of learners in terms of cognitive style spread with almost the same comparison, namely in each class has 5-6 learners with field independence cognitive style and about -20-22 learners have a field dependence cognitive style. The results of observations made show that learners need more instruction from teachers when following the learning process. In line with Witkin's opinion (1977) that the characteristic individual field dependence prefers to work in groups and requires more instruction from teachers. In addition, judging from the aspect of critical thinking according to Facione (2013), in the aspect of explanation and self-deprecation is still in urgent need of teacher assistance. As for the other 4 aspects, both FI and FD students are able to do so.

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