ISSN 2502-5872 (Print)
ISSN 2622-3627 (Elektronik)

Volume 9 Number 3, August 2024, 723-738

MATHEMATICAL LITERACY IN SOLVING HOTS-BASED PROBLEMS ON SPLDV MATERIAL IN TERMS OF COGNITIVE STYLE

Wanodya Kirana Intan Lively[1*], Isnaeni Umi Machromah[2]
[1,2]Departement of Mathematics Education, Universitas Muhammadiyah Surakarta, Central Java, Indonesia
*Correspondence: a410200105@student.ums.ac.id

ABSTRACT

The concept of mathematical aptitude pertains to an individual's capacity to articulate, elucidate, and employ mathematical principles in everyday scenarios. This investigation stemmed from concerns surrounding substandard levels of mathematical literacy, potentially stemming from students' inability to meet established benchmarks. The primary objective of this inquiry was to evaluate students' mathematical acumen in tackling HOTS-based challenges linked to SPLDV materials, while considering their cognitive inclinations. Employing a qualitative framework with a descriptive approach, the study centered on four eighth-grade students from SMP Negeri 3 Colomadu, comprising two individuals exhibiting a field-dependent cognitive style and two with a field-independent cognitive orientation. Data on the participants' mathematical proficiencies were gathered through a combination of assessment tools and interviews, complemented by a cognitive style questionnaire. The validity of the data was fortified through triangulation methodologies. Analysis ensued through three distinct phases: data reduction, presentation, and synthesis. The results showed that students with Field Dependent cognitive style type only fulfill one indicator of mathematical literacy, namely communication. While students with cognitive style type Field Independent able to meet all indicators of mathematical literacy well include communication, mathematization, representation, reasoning and argumentation, designing strategies to solve problems, as well as the use of operations, symbols, formal, and technical.
Keywords: Cognitif Style, HOTS Questions, SPLDV

How to Cite: Lively, A. K. I., & Machromah, I. U. (2024). Mathematical Literacy In Solving Hots-Based Problems On Spldv Material In Terms of Cognitive Style. *Mathline: Jurnal Matematika dan Pendidikan Matematika*, *9*(3), 723-738. http://doi.org/10.31943/mathline.v9i3.661

PRELIMINARY

The 21st century requires individuals to have skills, broad horizons, abilities in technology, critical thinking, collaboration, innovation, and creativity (Ahonen & Kinnunen, 2015). To realize these skills, it is necessary to have individual skills in the form of literacy. Mathematics is a place to train individual skills in facing the 21st century. Due to its abstract nature, systematic approach, logical reasoning, and abundance of formulas and symbols, mathematics is frequently perceived as a challenging subject for students (Auliya, 2016). Consequently, developing a strong foundation in mathematical literacy is essential for comprehending abstract mathematical concepts.

The interpretation, explanation, and practical application of mathematical concepts in real-life situations define mathematical literacy (Geraldine & Wijayanti, 2022). By comprehending the purpose and relevance of mathematics in everyday scenarios, students develop a deeper understanding of its functions and practicality (Yuliyani & Setyaningsih, 2022). This means that mathematical literacy can help a person to be more familiar with the role of mathematics in everyday life and is used as a basis for consideration in making decisions in society.

However, the fact is that literacy in mathematics in Indonesia is in the low category. Indonesia's performance in the 2018 PISA study, where it scored 379 and ranked 73rd out of 78 participating countries, clearly highlights the country's low standing in terms of international average scores (PISA, 2019). The lack of mathematical literacy among students can be attributed to their inclination towards solving routine problems rather than non-routine ones. To enhance the literacy skills of Indonesian students, it is crucial to expose them to non-routine problems, specifically those of the HOTS variety (Sidabutar et al., 2023).

The utilization of HOTS questions is an effective method for enhancing students' proficiency in mathematical literacy. These types of questions serve as a catalyst for the development of logical, critical, metacognitive, reflective, and creative thinking skills in students, as they are compelled to engage in high-level thinking and employ a systematic reasoning process (Santoso & Setyaningsih, 2020). Consequently, HOTS questions are highly appropriate for training students to cultivate their critical evaluation and creative thinking abilities. One of the mathematical contexts that can be applied in HOTS questions is SPLDV (System of Linear Equations of Two Variables) material. In solving the problem of the System of Equations Linear Equation System, students must be able to filter information, sort out important things, and solve problems with a systematic flow such as converting story problems into mathematical equations (Ulva, 2018). This can certainly train students to critical thinking or HOTS (Higher Order Thinking Skill).

In developing students' ability to solve a problem, there are factors that influence students' point of view in addressing the problem. One of them is the cognitive style of students. Each individual in processing information related to working on problems has a different cognitive style. DePorter and Hernacki (Ridwan, 2017) say that the combination of how to absorb, organize and process information is definition of learning styles. Based on differences in psychological aspects, cognitive style is divided into two consisting of Field Dependent and Field Independent.

Previous studies have explored the relationship between cognitive style and mathematical literacy. According to Yuliyani & Setyaningsih (2022), students classified as Field Independent demonstrate superior mathematical literacy skills compared to their Field Dependent counterparts. Additionally, (Safitri & Khotimah, 2023) argue that Field Independent students excel in all aspects of mathematical literacy, while Field Dependent students struggle with reasoning and providing explanations. This is attributed to their tendency to overlook important details when comprehending problem statements. However, no research has yet delved into the analysis of mathematical literacy in relation to cognitive style, particularly when students tackle Higher Order Thinking Skills (HOTS) problems involving SPLDV concepts.

In order to assess the level of mathematical literacy among students, it is important to evaluate their proficiency in each specific indicator. Therefore, the objective of this study is to analyze the cognitive style of eighth-grade students when solving higher-order thinking skills (HOTS) problems related to the topic of linear equations and inequalities. The focus will be on assessing their mathematical literacy abilities.

METHODS

The methodology employed for this study is descriptive qualitative research. The research approach is qualitative, aiming to investigate a specific phenomenon or social process (Creswell & Creswell, 2018). The study aims to examine all relevant facts without any manipulation (Sagala et al., 2019). The sample for this research consists of four students from class VIII at SMP Negeri 3 Colomadu, with two students exhibiting a Field Dependent cognitive style and the other two students demonstrating a Field Independent cognitive style.

The tools utilized in this study consist of mathematics literacy assessments in the form of tests, a survey, and a set of interview protocols. These instruments were specifically designed to align with the research objectives, problem formulation (Yorulmaz et al., 2021), and linguistic appropriateness.

The research phase begins with the submission of a questionnaire. Students were then divided into two groups based on their cognitive style types. After receiving the questionnaire, students were given test questions to measure their mathematical abilities. The questions asked are based on HOTS and SPLDV materials. These questions are used to measure each student's mathematical ability using indicators. The indicators used are: 1) communication, 2) mathematization, 3) representation, 4) reasoning and argumentation, 5)

design of problem-solving strategies, 6) use of operations, symbols, formal and technical properties (PISA, 2019). Interviews were then conducted using the source as a source of data related to the student's responses.

The question instrument along with the questionnaire was submitted by the researcher to 2 expert validators, namely 1 Mathematics Education Lecturer at Universitas Muhammadiyah Surakarta and 1 Mathematics Teacher at SMP Negeri 3 Colomadu. Both instruments were validated before being used for data collection (Tutticci et al., 2017). After the data were collected, data validity was checked using triangulation techniques. Triangulation techniques were carried out by comparing test data, interview data, and observation data (Fielding, 2012). In tests administered by each respondent to determine the student's abilities. Then data analysis technology includes three stages, including: data reduction, data presentation and drawing conclusions.

RESULTS AND DISCUSSION

Based on research that has been done in SMP Negeri 3 Colomadu obtained the results of the percentage of data on the type of cognitive style of students listed in Figure 1.

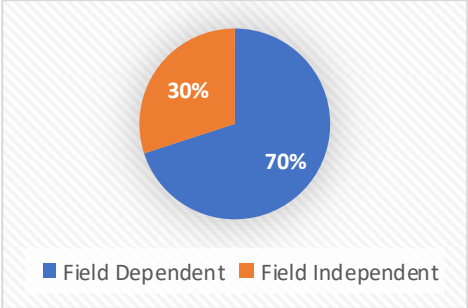

Figure 1. Percentage of Cognitive Style Type Data

Figure 1 shows that 70% (21 students) had a field-dependent cognitive style type and 30% (9 students) had a field-independent cognitive style type. The study is based on a cognitive style test in the form of a questionnaire instrument.

As for after grouping students into cognitive style types, then students are given HOTS-based literacy tests with SPLDV material. Selection of research subjects obtained two subjects with Field Dependent cognitive style namely SD1 and SD2, and two subjects with Field Independent cognitive style namely SF1 and SF2. The following are data on the mathematical literacy skills of each subject.

1. Field Dependent Subject 1

   The following are the answers to the SD1 mathematical literacy test:

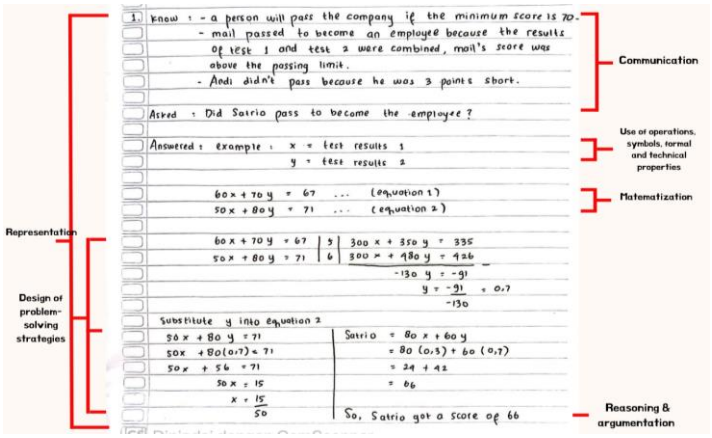

Figure 2. Subject SD1's Answer

According to Figure 2, subject SD1 can meet indicators such as communication, mathematization, representation, reasoning and reasoning, problem-solving strategies, and the use of operations, symbols, forms, and techniques. Below are the results of the interview with SD1.

P : "Can you explain what information is obtained and understood from the question?"

SD1 : "The information contained in the question is that a person will pass to be accepted by the company if he gets a minimum score of 70. The passing score comes from the combination of test scores 1 and 2. Mail's score is above the passing limit while Aldi's is not because his score is less than 3 points."

P : "What is asked from the question?"

SD1 : "Does Satrio pass to become the employee?"

P : "How do you change the information from the question into mathematical language (mathematical modeling)?"

SD1 : "Aldi's score: 60x + 70y = 70 - 3 = 67. Mail's score: 50x + 80y = 70 + 1 = 71"

P : "Can you explain how to solve the problem?"

SD1 : "The trick is that I first enter what the information is and what is asked in the problem then I change it to the mathematical language. Then I solve it with elimination and substitution. After that I entered the x and y values into Satrio and got the result. After that I conclude at the end of the answer."

P : "Can you explain the conclusion you got in doing the problem?"

SD1 : "The conclusion is that Satrio got a score of 66"

P : "Is there a particular formula that you used? Give the reason why you used the formula?"

SD1 : "I used the elimination and substitution formula. The reason is because I'm looking for one of the test result values."

P : "How did you choose the mathematical operations and symbols?"

SD1 : "I chose x and y to visualize"

According to the above interview results, the subjects can meet five mathematical ability indicators, including communication, mathematization, representation, reasoning and reasoning, designing strategies, and using appropriate symbols and operations. Subject SD1 was able to identify what information was included in the task and what was asked in the task, change the context into mathematical language, explain how to solve the problems in the problem, and design strategies to solve the problem. However, in drawing conclusions SD1 is less precise because it does not include whether or not Satrio is accepted at the company.

Based on test and interview results, SD1 subjects meet indicators such as communication, mathematization, representation, design strategies and the use of symbols and operations.

2. Field Dependent Subject 2

The following are the results of the answers to the SD2 mathematical literacy test:

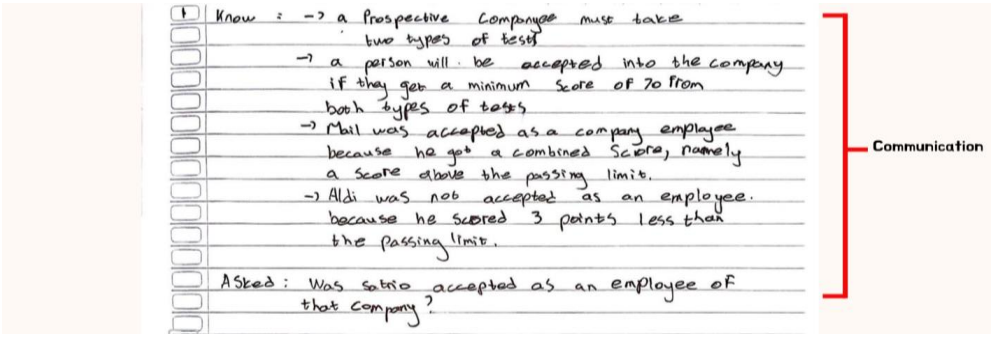

Figure 3. Subject SD2's Answer

According to Figure 3, object SD2 only meets the communication indicators. Below are the results of the interview with SD2.

P : "Can you explain what information is obtained and understood from the problem?"

SD2 : "A prospective employee of the company must take 2 kinds of tests. A person will be accepted by the company if the score of both tests is at least 70. Mail was accepted as an employee because he scored above the passing score. Aldi was not accepted because he scored 3 points less."

P : "What is asked from the question?"

SD2 : "Does Satrio pass to become an employee of the company?"

P : "How do you change the information from the question into mathematical language (mathematical modeling)?"

SD2 : "I don't know."

P : "Can you explain how to solve the problem?"

SD2 : "I don't know."

P : "Can you explain the conclusion you get in doing the problem?"

SD2 : (silent)

P : "Is there a particular formula that you used? Give the reason why you used the formula?"

SD2 : "Don't know"

P : "How do you choose math operations and symbols?"

SD2 : (silent)

Judging from the above interview results, this question can only meet one indicator, namely communication. SD2 can only provide answers to the information contained in the question. According to the test and interview results, SD2 meets the communication indicators.

3. Field Independent Subject 1

The following are the results of the answers to the SF1 mathematical literacy test:

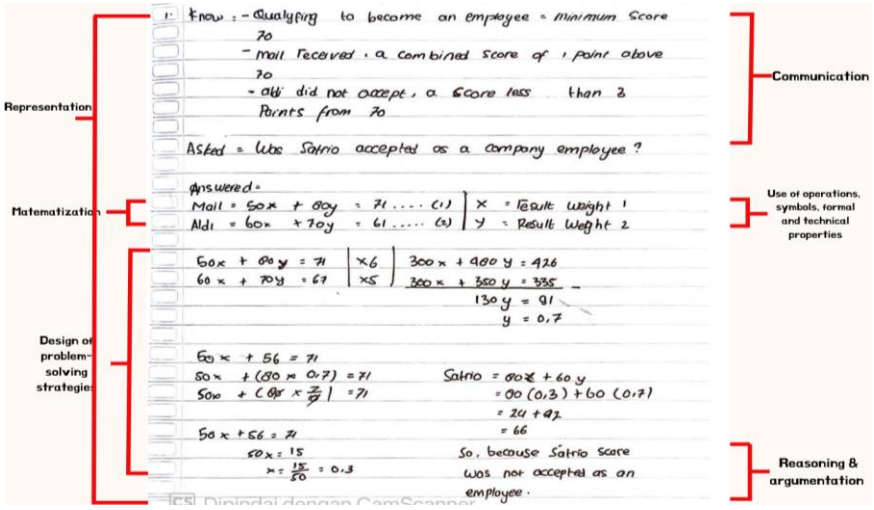

Figure 4. Subject SF1's Answer

According to Figure 4, SF1 subjects were able to write down the important information in the problem and the questions asked therein, change the context into mathematical form, or create a mathematical model, for example: 60x + 70y = 67, explain how to solve the results of his work coherently and the results are correct, able to write

conclusions, design strategies to solve problems using elimination and substitution, able to choose operations and mathematical symbols, for example by using x and y as a form of memorization of the weight of results 1 and 2. Make SF1 meet the communication, mathematics, representation, reasoning and reasoning indicators and design strategies, and the use of symbols and operations. The following are the results of the interview with SF1.

P : "Can you explain what information is obtained and understood from the question?"

SF1 : "Passing as an employee if you get a combined score of at least 70. Mail is accepted, because the combined score is 1 point above 70. Aldi is not accepted because the combined score is 3 points less than the passing score."

P : "What is asked from the question?"

SF1 : "Is Satrio accepted as an employee of the company?"

P : "How do you change the information from the problem into mathematical language (mathematical modeling)?"

SF1 : "Aldi's value: 60x + 70y = 70 - 3 = 67. Mail's score: 50x + 80y = 70 + 1 =71."

P : "Can you explain how to solve the problem?"

SF1 : "The trick is that I first find the information and what is asked in the problem and then initialize x and y as the weight of the results 1 and 2. Then I change it to mathematical language based on the problem information. Next, it is solved by elimination and substitution. After getting the value of each x and y, I entered it into Satrio and got the result. After concluding."

P : "Can you explain the conclusion you got in doing the problem?"

SF1 : "The conclusion is because Satrio got a score of 66 then Satrio was not accepted as a company employee"

P : "Is there a particular formula that you used? Give the reason why you used that formula?"

SF1 : "Elimination and substitution formula. The reason follows the question asked."

P : "How did you choose the mathematical operations and symbols?"

SF1 : "I chose x and y to symbolize the result weights 1 and 2."

According to the above interview results, SF1 can meet the indicators of communication, mathematics, expression, reasoning and argumentation, strategic design, use of symbols and operations, etc. According to test and interview results, SF1 meets all six mathematics indicators, including communication, mathematization, representation, reasoning and reasoning, design strategies, and use of symbols and operations.

4. Field Independent Subject 2

The following are the answers to the SF2 mathematical literacy test:

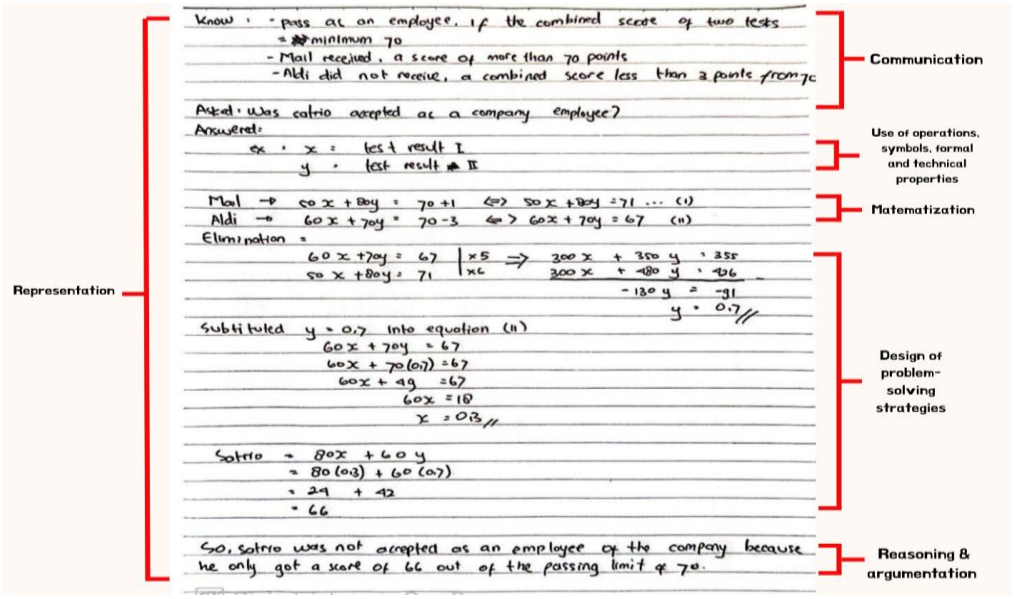

Figure 5. Subject SF2's Answer

Based on Figure 5, the SF2 subject is able to write down important information in the problem, able to change the context into mathematical language or model mathematics, for example: 50x + 80y = 71, solve the problem with the solution method he used and get the right final result, draw conclusions and write in his work correctly, Devise strategies for solving problems using elimination and substitution, and choose X and Y symbols to memorize. Make SF2 meet mathematical indicators such as communication, mathematization, representation, reasoning and reasoning, design strategies, use of symbols and operations, etc. Below you will find the results of an interview with test subject SF2.

P : "Can you explain what information is obtained and understood from the problem?"

SF2 : "Pass as an employee if the combined score of the 2 tests is at least 70. Mail was accepted, because the combined score was 1 point above 70. Aldi was not accepted because the combined score was 3 points less than 70."

P : "What is asked in the question?"

SF2 : "Is Satrio accepted as an employee of the company?"

P : "How do you change the information from the question into mathematical language (mathematical modeling)?"

SF2 : "Mail's value: 50x + 80y = 70 + 1 = 71. Aldi's score: 60x + 70y = 70 - 3 = 67. Being Mail's value: 50x + 80y = 71. Aldi's value: 60x + 70y = 67."

P : "Can you explain how to solve the problem?"

SF2 : "First find out what the information is and what is asked in the problem then memorize x and y as test results 1 and 2. Then find the value of y by elimination, find the value of x by substitution. Then substitute the x and y values into Satrio's 80x + 60y and get the final result of 66. Then conclude based on the final result obtained"

P : "Can you explain the conclusion you get in doing the problem?"

SF2 : "The conclusion is that Satrio was not accepted as an employee of the company because he got a score of 66 from the passing score of 70."

P : "Is there a particular formula that you used? Give the reason why you used that formula?"

SF2 : "Elimination and substitution formula."

P : "How did you choose the mathematical operations and symbols?"

SF2 : "I chose x and y to symbolize the results of test 1 and 2."

According to the aforementioned interview, SF2 satisfies the requirements for communication, mathematization, representation, argumentation and reasoning, strategy design, and the application of symbols and operations. SF2 met all mathematical indications, including communication, mathematization, representation, reasoning and argumentation, strategy design, and the usage of symbols and operations, according to the test and interview findings.

Field Dependent mathematical literacy skills

Only in communication were field dependent participants able to meet several measures of mathematical literacy. Field Dependent subjects can mention the known information in the problem along with what is asked related to the problem (Rufaidah & Ismail, 2021). Nonetheless, it has been reported that they are less adept at writing in their native tongue and more likely to write in accordance with the requirements of the task (Hasanah et al., 2019). It has not been possible for field dependent disciplines to model mathematics or translate the context into mathematical language. This agrees with research (Yuliyani & Setyaningsih, 2022) which says that Field Dependent subjects who have limited analysis have not fulfilled mathematical abilities. In the representation indicator, the actions necessary to solve the problem have not been completed by the Field

Dependent subject. This is a result of the subject's incompetence in issue understanding and analysis (Lestari et al., 2021).

Field Dependent pupils continue to struggle with creating strategies for problem solving, as seen by the indicator of generating ways to tackle issues. According to Kurniawati & Kurniasari (2019), this occurred because strategy execution skills were still comparatively weak. In line with Rahmasari & Setyaningsih (2023) who said that Field Dependent subjects have difficulty in developing effective strategies in solving problems. In the indicator of drawing conclusions, Field Dependent subjects when working on problems have not been able to draw the right conclusions in the final conclusion of the answer. This is in line with the opinion of (’Aisyah et al., 2021), who said Field Dependent subjects were less able to draw conclusions. A similar opinion is supported by Muthmainnah et al., (2023) who said the subject was less able to provide a final conclusion on his answer properly. So that Field Dependent subjects have not been able to fulfill the reasoning and argumentation indicators. In the indicators of the use of operations, symbols, formal, and technical, Field Dependent subjects lack understanding in the use of symbols. This is evident in the test results and interview results of FD2 who was confused when asked about the symbols used. (Noviana & Murtiyasa, 2020) concluded that the subject only has communication skills, while in determining strategies to solve problems, and the ability to reason and provide reasons is still lacking.

Mathematical literacy ability of Field Independent

According to recent studies, individuals exhibiting a cognitive style reliant on field context demonstrate proficiency across various domains of mathematical literacy, encompassing effective communication, mathematical abstraction, symbolic representation, logical reasoning, strategic problem-solving, and adept utilization of mathematical operations and formal symbols. Consequently, it appears that those with an autonomous cognitive orientation surpass their counterparts with field-dependent tendencies (Fadilatussyifa & Setyaningsih, 2023). In research Taufik & Zainab (2021), it was observed that students characterized by a Field Independent cognitive style possess the capability to discern relevant information, devise and implement effective problem-solving strategies, employ verbal and symbolic representations proficiently, engage in mathematically sound modeling, and demonstrate adept contextual interpretation skills.

Regarding communication metrics, individuals exhibiting a Field Independent cognitive orientation exhibit proficiency in discerning the crux of a problem by articulating it in their own words. As highlighted by Wulan & Anggraini (2019), those with a Field

Independent cognitive style, characterized by autonomy from contextual influence, typically demonstrate accuracy in problem expression and utilize personalized language adeptly. This indicates that students possessing a Field Independent cognitive disposition excel in accurately depicting the information embedded within a problem. In terms of the mathematization parameter, Field Independent individuals exhibit proficiency in translating contextual scenarios into mathematical language or models. This observation stems from empirical evidence obtained through tests and interviews, showcasing students' adeptness in transforming statements into mathematical expressions through modeling techniques. In contrast to the perspective put forth by Yuliyani & Setyaningsih (2022), which suggests that Field Independent individuals fail to satisfy the benchmarks of mathematical literacy in terms of mathematization, insights from Silma et al., (2019) elucidate that students characterized by a Field Independent cognitive inclination lean towards analytical thinking. This assertion aligns with research findings indicating that Field Independent students exhibit problem-solving prowess and offer detailed explanations during interviews with researchers, thereby fulfilling the representation criterion.

Field-independent students have good and varied reasoning skills in solving a problem that involves several complex assumptions (Pratiwi et al., 2019). In line with Elenna et al., (2023) who said Field Independent subjects were able to link quite complex conjectures to determine solutions that could be used. To ensure the fulfillment of the reasoning and argumentation criteria. As for the parameter concerning devising strategies to tackle challenges, Field Independent students are able to connect complex assumptions to determine the strategy to use and it requires good reasoning to solve the problem correctly. The strategy that is used is appropriate in solving the problem, so that the student can get the right answer and is in accordance with the solution that is determined by the researcher (Kholid et al., 2020). According Fatmawati (2018) in (Zuniawarti & Febriyanti, 2023) Students with cognitive abilities Field iIndependent can use symbols (notation) to express problems. Students use symbol to solve problems System Linear Equation Two variables. Students use symbols in the formulation and use symbols in writing the formulas used in a complete way. In this case, the subject of the Independent Field fulfills the indicators of the use of operations, symbols, normals, and technicalities.

There are six indicators of mathematical literacy carried out in solving HOTS problems by subjects. Of the six indicators, there is only one indicator that can be achieved by Field Dependent subjects. Meanwhile, Field Independent subjects met all the indicators

including communication, mathematization, representation, designing strategies to solve problems, drawing conclusions, and using operations, symbols, iformal, and technical means. Then in the problem-solving process, the subject wrote down the information known, asked, and answered. And wrote the conclusion quite clearly. The limitation in this study lies in the implementation time. The limitation of implementation time is because the time available for data collection is quite long because it adjusts the subject's schedule.

CONCLUSION

Following extensive research and discourse, the examination of students' mathematical literacy in addressing HOTS (Higher Order Thinking Skills) problems reveals that individuals with a Field Dependent cognitive inclination demonstrate proficiency solely in the communication aspect of mathematical literacy. Conversely, students exhibiting a Field Independent cognitive style showcase competence across all facets of mathematical literacy, encompassing communication, mathematization, representation, strategy formulation for problem-solving, drawing conclusions, and the adept application of operations, symbols, formal procedures, and technical methodologies. This research focuses on mathematical literacy mathematical literacy in solving HOTS-based problems in the material of the System of Linear Two-Variable Equations Linear Equation System material in terms of students' cognitive style. It is expected that for future research can be done to develop students' mathematical literacy through the learning model. Thus, by using a learning model learning model is expected to help students improve their mathematical literacy mathematical literacy even better.

REFERENCES

’Aisyah, M. N., Sutrisno, S., & Pramasdyahsari, A. S. (2021). Kemampuan Penalaran Matematis dalam Menyelesaikan Soal Literasi Matematika Ditinjau dari Gaya Kognitif. *JKPM (Jurnal Kajian Pendidikan Matematika)*, *7*(1), 143–144. https://doi.org/10.30998/jkpm.v7i1.11127

Ahonen, A. K., & Kinnunen, P. (2015). How Do Students Value the Importance of Twenty-first Century Skills? *Scandinavian Journal of Educational Research*, *59*(4), 395–412. https://doi.org/10.1080/00313831.2014.904423

Auliya, R. N. (2016). Kecemasan Matematika dan Pemahaman Matematis. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *6*(1), 12–22. https://doi.org/10.30998/formatif.v6i1.748

Creswell, J. W., & Creswell, J. D. (2018). Mixed Methods Procedures. In *Research Defign: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publication.

Elenna, E., Setiani, A., & Imswatama, A. (2023). Analisis Kemampuan Literasi

Matematika Pada Gaya Kognitif di Era Implementasi Merdeka Belajar. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *7*(3), 2261–2276. https://doi.org/10.31004/cendekia.v7i3.2629

Fadilatussyifa, Z., & Setyaningsih, N. (2023). Analisis Keterampilan Metakognisi Siswa Dalam Memecahkan Masalah Masalah Asesmen Kompetensi Minimum (AKM) Ditinjau Dari Gaya Kognitif. *Math Didactic: Jurnal Pendidikan Matematika Volume*, *9*(2), 264–277. https://doi.org/10.33654/math.v9i2.2163

Fielding, N. G. (2012). Triangulation and Mixed Methods Designs: Data Integration With New Research Technologies. *Journal of Mixed Methods Research*, *6*(2), 124–136. https://doi.org/10.1177/1558689812437101

Geraldine, M., & Wijayanti, P. (2022). Literasi Matematika Siswa dalam Menyelesaikan Soal PISA Konten Change and Relationship Ditinjau dari Self Efficacy. *Jurnal Riset Pendidikan Dan Inovasi Pembelajaran Matematika (JRPIPM)*, *5*(2), 82–102. https://doi.org/10.26740/jrpipm.v5n2.p82-102

Hasanah, U., Edwita, & Ahmad Januar. (2019). Literasi Matematika, Gaya Kognitif Dengan High Order Thinking Skill: Studi Korelasional. *Jurnal Pendidikan Dasar*, *10*(2), 11–23. https://doi.org/10.21009/jpd.v10i2.12816

Kholid, M. N., Hamida, P. S., Pradana, L. N., & Maharani, S. (2020). Students' critical thinking depends on their cognitive style. *International Journal of Scientific and Technology Research*, *9*(1), 1045–1049.

Kurniawati, I., & Kurniasari, I. (2019). Literasi Matematika Siswa Dalam Menyelesaikan Soal Pisa Konten Space and Shape Ditinjau Dari Kecerdasan Majemuk. *MATHEdunesa*, *8*(2), 441–448. https://doi.org/10.26740/mathedunesa.v8n2.p441-448

Lestari, Y., Rahman, A. A., & Muksar, M. (2021). Analysis of Students' Mathematical Literacy Skill In Solving PISA Mathematical Problems. *MaPan*, *9*(1), 102–118. https://doi.org/10.24252/mapan.2021v9n1a7

Muthmainnah, S., Hakim, F., & Nurhidayah, N. (2023). Analisis Kemampuan Pembuktian Matematika Siswa SMA Negeri 1 Alu Ditinjau dari Gaya Kognitif. *Saintifik*, *9*(2), 235–241. https://doi.org/10.31605/saintifik.v9i2.430

Noviana, K. Y., & Murtiyasa, B. (2020). Kemampuan Literasi Matematika Berorientasi PISA Konten Quantity Pada Siswa SMP. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *4*(2), 195–196. https://doi.org/10.33603/jnpm.v4i2.2830

PISA. (2019). PISA 2018 Results: Combined Executive Summaries: What Students Know and Can Do. *OECD 2019*, *I,II,&III*. https://doi.org/10.1787/g222d18af-en

Pratiwi, D. A., Trapsilasiwi, D., Oktavianingtya, E., & Murtikusuma, S. R. P. (2019). Level Literasi Matematika Siswa Dalam Menyelesaikan Soal Pisa Konten Change and Relationship Berdasarkan Gaya Kognitif. *Kadikma*, *10*(3), 1–14. https://doi.org/10.19184/kdma.v10i3.17401

Rahmasari, I., & Setyaningsih, N. (2023). Kemampuan Literasi Matematika Siswa dalam Memecahkan Soal Cerita Berdasarkan Langkah Polya pada Materi SPLDV Ditinjau dari Gaya Kognitif. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *7*(2), 1773–1786. https://doi.org/10.31004/cendekia.v7i2.2402

Ridwan, M. (2017). Profil kemampuan penalaran matematis siswa ditinjau dari gaya belajar [Profile of students' mathematical reasoning ability viewed from learning style]. *Kalamatika Jurnal Pendidikan Matematika*, *2*(2), 193–205. https://doi.org/10.22236/KALAMATIKA.vol2no2.2017pp193-206

Rufaidah, A. S., & Ismail, I. (2021). Profil Berpikir Kritis Siswa Dalam Memecahkan Masalah Matematika Open Ended Ditinjau Dari Gaya Kognitif Field Dependent-Independent. *Jurnal Penelitian Pendidikan Matematika Dan Sains*, *5*(1), 19.

https://doi.org/10.26740/jppms.v5n1.p19-25

Safitri, A., & Khotimah, R. P. (2023). Kemampuan Literasi Matematika Peserta Didik dalam Menyelesaikan Soal PISA Konten Space and Shape Ditinjau dari Gaya Kognitif. *Jambura Journal of Mathematics Education*, *4*(1), 24–34. https://doi.org/10.34312/jmathedu.v4i1.18745

Santoso, R. M., & Setyaningsih, N. (2020). Literasi Matematika Siswa Dalam Menyelesaikan Soal Hots Bentuk Aljabar Berdasarkan Kemampuan Matematika. *Prosiding Konferensi Nasional Penelitian Matematika Dan Pembelajarannya (KNPMP) V*, 62–71.

Sidabutar, E. R., Simanjuntak, R. M., & Hutauruk, A. (2023). Analisis Kemampuan Literasi Matematika Siswa Dalam Menyelesaikan Soal Hots Dan Self-Regulated Learning Pada Materi SPLTV Di SMA Swasta Pamasta Tanjung Morawa. *INNOVATIVE:Journal Of Social Science Research*, *3*(2), 5926–5939. https://doi.org/10.31004/innovative.v3i2.1007

Silma, U., Sujadi, I., & Nurhasanah, F. (2019). Analysis of students' cognitive style in learning mathematics from three different frameworks. *AIP Conference Proceedings*, *2194*. https://doi.org/10.1063/1.5139850

Taufik, A. R., & Zainab, N. (2021). Mathematical literacy of students in solving PISA-like problems based on cognitive styles of field-dependent and field-independent. *Journal of Physics: Conference Series*, *1918*(4). https://doi.org/10.1088/1742-6596/1918/4/042080

Tutticci, N., Coyer, F., Lewis, P. A., & Ryan, M. (2017). Validation of a reflective thinking instrument for third-year undergraduate nursing students participating in high-fidelity simulation. *Reflective Practice*, *18*(2), 219–231. https://doi.org/10.1080/14623943.2016.1268115

Ulva, E. (2018). Profil Kemampuan Berpikir Kritis Matematis Siswa SMP Negeri Pada Materi Sistem Persamaan Linier Dua Variabel (SPLDV). *Jurnal Pendidikan Tambusai*, *2*(5), 944–952. https://doi.org/10.31004/jptam.v2i5.73

Wulan, E. R., & Anggraini, R. E. (2019). Gaya Kognitif Field-Dependent dan Field-Independent sebagai Jendela Profil Pemecahan Masalah Polya dari Siswa SMP. *Journal Focus Action of Research Mathematic (Factor M)*, *1*(2), 123–142. https://doi.org/10.30762/factor_m.v1i2.1503

Yorulmaz, A., Uysal, H., & Çokçaliskan, H. (2021). Pre-service primary school teachers' metacognitive awareness and beliefs about mathematical problem solving. *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, *6*(3), 239–259. https://doi.org/10.23917/jramathedu.v6i3.14349

Yuliyani, D. R., & Setyaningsih, N. (2022). Kemampuan Literasi Matematika dalam Menyelesaikan Soal Berbasis PISA Konten Change and Relationship Ditinjau dari Gaya Kognitif Siswa. *Edukatif : Jurnal Ilmu Pendidikan*, *4*(2), 1836–1849. https://doi.org/10.31004/edukatif.v4i2.2067

Zuniawarti, & Febriyanti, R. (2023). Volume 15. Nomor 2. Mei 2023. *EduMath*, *15*(2), 48–53. https://doi.org/10.32682/edumath.v15i2.2995