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CREATIVE THINKING ABILITY OF STUDENTS WITH THEORIST AND PRAGMATIST LEARNING STYLES IN SOLVING NUMBER OPERATION PROBLEMS

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Abstract

Creative thinking skills are essential in mathematics learning to address 21st-century challenges. This study aims to describe the creative thinking abilities of students with theorist and pragmatist learning styles in solving problems on number operations. The research employed a descriptive qualitative approach, with two subjects representing theorist and pragmatist learning styles, selected using purposive sampling from 27 seventh-grade students. The research instruments included the Learning Style Questionnaire (LSQ), problem-solving tests, and interview guidelines. Data were collected through questionnaires, tests, and interviews, then analyzed based on the indicators of fluency, flexibility, originality, and elaboration. The results revealed that students with a theorist learning style tend to produce structured and logical solutions, utilizing various approaches but showing limited innovation. Conversely, students with a pragmatist learning style demonstrated more practical and flexible approaches, along with originality through unique strategies, although their accuracy depended on precise assumptions. In conclusion, creative thinking abilities are influenced by students' learning styles. Teachers are advised to provide exercises targeting all aspects of creative thinking to enhance the variation and quality of students' solutions.

Keywords: Creative thinking, theorist learning style, pragmatic learning style, problem solving.

Abstrak

Kemampuan berpikir kreatif merupakan keterampilan penting dalam pembelajaran matematika untuk menghadapi tantangan abad ke-21. Penelitian ini bertujuan mendeskripsikan kemampuan berpikir kreatif siswa dengan gaya belajar teoris dan pragmatis dalam menyelesaikan masalah pada materi operasi bilangan. Penelitian ini menggunakan pendekatan deskriptif kualitatif dengan subjek dua siswa, masing-masing mewakili gaya belajar teoris dan pragmatis, yang dipilih melalui teknik purposive sampling dari 27 siswa kelas VII. Instrumen penelitian meliputi Learning Style Questionnaire (LSQ), tes pemecahan masalah, dan pedoman wawancara. Data dikumpulkan melalui metode angket, tes, dan wawancara, kemudian dianalisis berdasarkan indikator kelancaran, keluwesan, keorisinalan, dan elaborasi. Hasil penelitian menunjukkan bahwa siswa dengan gaya belajar teoris cenderung menghasilkan solusi yang terstruktur dan logis, menggunakan berbagai pendekatan, tetapi kurang inovatif. Sebaliknya, siswa dengan gaya belajar pragmatis lebih praktis dan fleksibel, serta mampu menunjukkan keorisinalan melalui strategi unik, meskipun masih terbatas pada keakuratan asumsi. Kesimpulannya, kemampuan berpikir kreatif dipengaruhi oleh gaya belajar siswa. Guru disarankan untuk memberikan latihan yang melatih seluruh aspek berpikir kreatif guna meningkatkan variasi dan kualitas solusi siswa.

***Kata kunci**: Berpikir kreatif, gaya belajar teoris, gaya belajar pragmatis, menyelesaikan masalah.*

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INTRODUCTION

In the 21st century, individuals are required to face the continuously evolving global economy, making creative thinking skills a fundamental necessity (Cropley, 1992). These skills are not only beneficial in the academic field but are also essential in a competitive and ever-changing workforce. Creative thinking enables individuals to develop effective solutions to unstructured or routine problems, particularly in situations where no predefined guidelines or procedures exist (Cropley & Cropley, 2019). It allows individuals to explore new and innovative ways to resolve such challenges. In the context of mathematics, creative thinking plays a crucial role in supporting mathematical reasoning and facilitating the clear and precise communication of ideas (Novita & Putra, 2016). In other words, students with strong creative thinking skills can develop logical and structured mathematical arguments that are easily understood by others. Furthermore, creative thinking enables students to connect mathematical concepts with real-life situations, making their applications more relevant (NCTM, 2000). This highlights that mathematics learning extends beyond theoretical knowledge, providing practical experiences that help students understand how mathematics can be applied to solve real-world problems, such as managing budgets, designing construction patterns, or predicting trends based on data. As a result, students will acquire skills that are more meaningful and applicable.

Based on the previous statements, it is evident that the creative thinking process is important to enhance. However, the creative thinking skills of Indonesian students remain far from ideal. Research indicates that creative thinking skills among Indonesian secondary school students are still lacking (Ni'mah & Shodikin, 2022; Siraj & Nuriadin, 2022; Widiastuti et al., 2018). In fact, Indonesia ranks 115th out of 139 countries in the Global Creativity Index (Florida et al., 2015). Additionally, the 2022 PISA results in mathematics show that Indonesia is ranked 66th out of 81 countries, with an average score of 366 (OECD, 2023). The low level of students' creative thinking skills can be attributed to several factors. First, students tend to focus excessively on what is taught by teachers without the courage to explore and attempt ideas beyond the given examples (Manazila et al., 2022). Second, the teaching methods used by educators are often monotonous (Florentina & Leonard, 2017). Here, "monotonous" refers to teacher-centered instruction that does not actively involve students. Lastly, teachers tend to evaluate or assess only basic skills (Fitria et al., 2024).

Teachers play a crucial role in providing opportunities for students to develop their creative thinking potential (Cristóvão et al., 2020). One effective way to enhance creative thinking is through problem-solving activities. Problem-solving plays a significant role in fostering students' creative thinking abilities. Sutrisno et al (2019) explained that the problem-solving process creates opportunities for students to generate new and original ideas. According to Siswono (2005), creative thinking can be achieved through problem-solving activities. This view aligns with Puspitasari et al (2018), who stated that creative thinking is essential for solving problems in mathematics learning. By engaging in creative thinking, students can develop various strategies and

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generate diverse possible solutions. Problem-solving involves efforts to resolve challenges using existing knowledge, skills, and understanding previously acquired (Siswono, 2018). The problem-solving process encompasses understanding the problem, creating a solution plan, implementing the plan, and reviewing the solutions obtained (Siswono, 2005). In mathematics, problems are defined as challenging questions that require higher-order reasoning to solve (Rohati et al., 2023). Mathematical problems can take the form of story problems, presented as narrative texts that relate to real-life situations or other meaningful and easily comprehensible contexts (Pratiwi et al., 2021).

Students' creative thinking in solving problems is influenced by various factors, one of which is differences in learning styles. Each student has a unique way of understanding and internalizing a concept. These differences in learning styles play a significant role in determining the level of students' understanding, where students who learn according to their preferred learning styles tend to achieve more optimal results compared to those using mismatched approaches. Learning styles are fundamental characteristics inherent in individual students, relating to how they absorb, process, and communicate information (Ishak, 2024). This aligns with Khoo et al (2024), who stated that learning styles are a combination of processes for absorbing, organizing, and managing received information. Furthermore, Taş & Minaz (2024) emphasized that learning styles describe how students understand, manage, and process information or learning materials. Learning styles can be categorized into several types, representing different approaches students use to receive and process information. In this study, the learning style model adopted is Honey and Mumford's, which consists of four types: activist, reflector, theorist, and pragmatist. Students with an activist learning style tend to enjoy new challenges and learn through direct experiences. The reflector learning style describes students who prefer to observe and consider various perspectives before acting. Meanwhile, theorist learners tend to think systematically and logically, favoring structured concepts. Conversely, pragmatist learners focus on the direct application of what they have learned and seek practical solutions that can be applied in real life (Honey & Mumford, 2006).

Among the four learning styles, the theorist and pragmatist learning styles represent two distinct approaches to problem-solving. Students with theorist and pragmatist learning styles exhibit contrasting characteristics. Theorist learners focus on understanding theories before engaging in practice, whereas pragmatist learners prioritize the direct application of ideas (Ferdiani, 2024). These differences are thought to influence creative thinking abilities, including fluency, flexibility, originality, and elaboration in generating, structuring, planning, and implementing ideas to solve problems. Although several studies have explored creative thinking based on learning styles, such as Ferdiani & Harianto (2024) which examined the differences in creative thinking between theorist and pragmatist learners in solving statistical problems, and (Ferdiani et al., 2023) which described the creative thinking processes of activist learners in posing and solving geometric problems, no studies have specifically focused on the creative

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thinking abilities of students with theorist and pragmatist learning styles in the context of number operations. This research gap is critical to address, given that number operations are fundamental in mathematics. Therefore, this study aims to fill this gap by exploring the creative thinking abilities of students with theorist and pragmatist learning styles in solving problems related to number operations.

METHOD

This study is qualitative research aimed at describing students' creative thinking abilities based on theoretical and pragmatic learning styles in solving problems on the topic of number operations. The type of research employed is descriptive qualitative, utilizing qualitative methods with a descriptive approach. The research method used to collect data is the descriptive method, designed to describe the results of the analysis of students' creative thinking abilities based on theoretical and pragmatic learning styles in solving problems related to number operations.

The data source for this study comprised 27 seventh-grade students from a public junior high school in Surabaya during the odd semester of the 2023/2024 academic year. From these 27 students, two were selected as research subjects: one with a theoretical learning style and one with a pragmatic learning style. These two subjects were chosen based on the highest scores obtained from the learning style questionnaire for theoretical and pragmatic learning styles, as well as the results of the creative thinking ability test aligned with the creative thinking indicators. Additionally, the selected students demonstrated good communication skills.

The research instruments utilized in this study included the Learning Style Questionnaire (LSQ) adapted from Honey & Mumford (2006), the Problem-Solving Test (PST), and interview guidelines. The data collection methods implemented in this study consisted of questionnaires, tests, and interviews. The data analysis techniques used in the study are as follows:

1. Analysis of the Learning Style Questionnaire (LSQ)

A total of 27 students were given the Learning Style Questionnaire (LSQ), which consists of 80 items covering the dimensions of knowledge, expectations, and evaluation. Students completed the questionnaire by checking the box next to each statement that they felt applied to them. Each checked statement was assigned a score of one, while unchecked statements received a score of zero. The scores were then totaled to obtain the overall score for each learning style. Each learning style was categorized into specific score ranges based on the intensity of preference, as outlined in the scoring guidelines provided by Honey and Mumford (2006). Statements that are checked will be given a score of one, statements that are left blank will be given a score of zero. Then the scores are totaled to get the total learning style score.

2. Problem-Solving Test (PST) Analysis

In this study, students were given one problem-solving task that encompassed the indicators of fluency, flexibility, originality, and elaboration. The analysis of the creative thinking test results for each research subject was conducted based on these four creative thinking indicators. The creative thiking indicators are detail in Table 1.

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Table 1. Creative Thinking Indicators

Creative Thinking Indicator	Description
Fluency	1. Understand the information known and asked. 2. Mention the assumptions of the answer and how to achieve the answer. 3. Give reasons for the ideas given.
Flexibility	1. See the problem from a different perspective. 2. Generate alternative questions, ideas, answers. 3. Be able to change the approach according to the problem faced.
Originality	1. Generating Think of new and different ways of solving. 2. Combine different ways of solving.
Elaboration	1. Developing solutions and answers in depth. 2. Adding details to an object, idea, or situation to make it more engaging.

3. Interview Analysis

The interviews conducted in this study aimed to gather additional information about the results of the Problem-Solving Test (PST). The interview analysis involved the following steps:

(1) Reducing data by focusing on important aspects.
(2) Presenting data systematically to make it easy to understand.
(3) Maka a conclusions.

The interview guidelines are detailed in Table 2.

Table 2. Interview guidelines

No	Questions	Indicator
1	Please describe the problem and what you understand from it!	Fluency
2	Can you think of several different ways to solve the problem?	Fluency
3	How do you make sure your solution covers many possibilities?	Fluency
4	If your initial method doesn't work, what other approaches could you use?	Fluency
5	Can you look at the problem from a different perspective?	Flexibility
6	Is there a way to solve it that you think is different from the usual?	Flexibility
7	Can you explain the steps of your solution in detail?	Novelty

RESULTS AND DISCUSSION

A. RESULT

1. Data from the Learning Style Questionnaire (LSQ)

One of the instruments used in this study to determine students' learning styles according to Honey and Mumford is the Learning Style Questionnaire (LSQ). A total of 27 seventh-grade students were given the LSQ. The students were then categorized into four learning styles: activist, reflector, theorist, and pragmatist. The LSQ results showed that 5 students had an activist learning style, 12 students had a reflector

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learning style, 4 students had a theorist learning style, and 6 students had a pragmatist learning style. Based on this information, as well as input from the mathematics teacher and communication results, two subjects were identified: one student with a theorist learning style and one with a pragmatist learning style. Further details on the classification and scores of the students are presented in Table 3.

Table 3. List of research subjects

No	Student Code	Score	Learning Style
1.	MCR	17	Theorist
2.	SNS	18	Pragmatist

2. Data from the Creative Thinking Ability Test and Interviews

All three research subjects were given a creative thinking ability test, which covered four creative thinking indicators: fluency, flexibility, originality, and elaboration. After the results of the creative thinking ability test were obtained, the researcher conducted interviews with the four subjects to gain deeper insights into their responses in solving the test.

Below is the analysis of the results of the creative thinking ability test based on the mathematical self-concept of the students in solving open-ended math problems, as performed by the three research subjects.

The responses of the subject with the theorist learning style (MCR) in solving problems are presented in Figure 1 and 2.

In the fluency aspect, with the indicator of generating various answers regarding the monthly salary of a Gojek driver, MCR was able to list the necessary assumptions before solving the problem, such as the number of working days and hours, the hours available for accepting orders, and the number of orders per day.

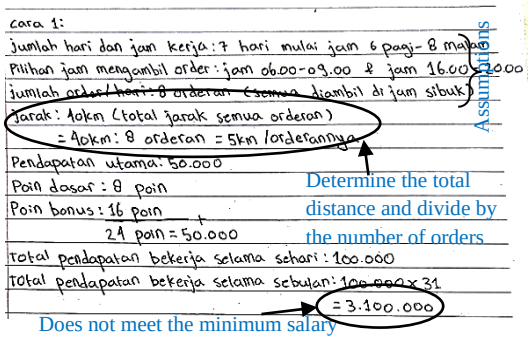

Figure 1 . MCR's test results using method 1

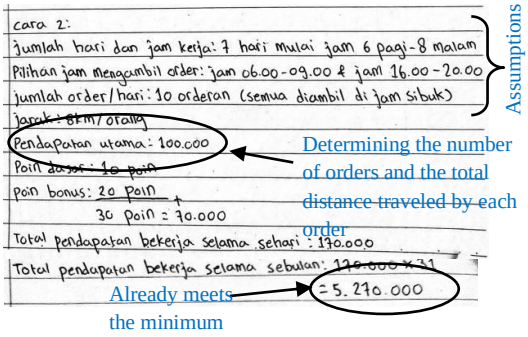

Figure 2. MCR's test results using method 2

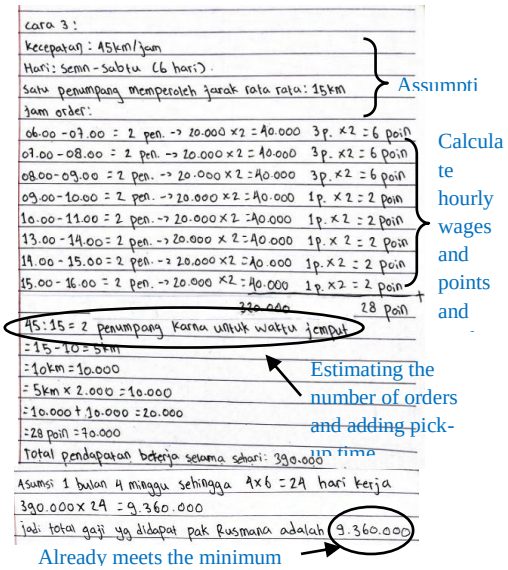

Figure 3. MCR's test results using method 3

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In the first answer, assuming 31 working days, orders were taken from 06:00 to 09:00 and from 16:00 to 20:00, with 8 orders per day during peak hours. This resulted in a salary of 3,100,000, which did not meet Mr. Rusmana's expectation of a minimum salary of 4,800,000. In the second answer, with the same assumption of 31 working days, the hours remained 06:00-09:00 and 16:00-20:00, but 10 orders per day were taken during peak hours. This resulted in a salary of 5,270,000, which met the minimum salary expectation. In the third answer, assuming 24 working days, orders were taken from 06:00 to 11:00 and from 13:00 to 16:00, with 8 orders per day during peak hours. This resulted in a salary of 9,360,000, which also met the minimum salary expectation. Therefore, MCR was able to generate 3 different answers with different assumptions, with 2 answers meeting the minimum salary requirement and 1 not meeting it.

In the flexibility aspect, with the indicator of using more than one method to achieve the minimum salary, MCR applied three different approaches. In the first method, MCR calculated the total distance for all orders and divided it by 8 orders. This resulted in an assumption that Mr. Rusmana would need to travel approximately 5 km for each order. In the second method, MCR directly determined the distance per order, i.e., 8 km per hour. In the third method, MCR determined Mr. Rusmana's average speed to be 45 km/h, allowing him to cover 45 km in 1 hour. MCR then adjusted the assumptions regarding pickup times and utilized peak hours to maximize bonus points. Thus, MCR was able to use 3 different methods to solve the problem.

In the originality aspect, MCR did not demonstrate unconventional methods. MCR created a specific scenario based on assumptions regarding the number of orders per day, total distance traveled, and speed. This approach was relevant but still conventional. No unique strategy or innovative solution was introduced in the planning process.

In the elaboration aspect, with the indicator of writing detailed assumptions and solving the problem systematically, MCR's solutions were very thorough. In all three answers, MCR was able to calculate main income, bonus points, and total daily income with clear steps. MCR also provided detailed explanations about the division of work hours and Mr. Rusmana's daily target.

Based on the presentation of the answers and interviews above, MCR was able to demonstrate all three aspects of the creative thinking indicators.

The responses of the subject with the pragmatist learning style (SNS) in solving the problem are in Figure 4 and 5.

In the fluency aspect, with the indicator of generating various answers regarding the monthly salary of a Gojek driver, SNS was able to list the necessary assumptions before solving the problem, such as the number of working days, working hours, hours available for accepting orders, and the number of orders per day. In the first answer, assuming 24 working days, orders were taken from 08:00-12:00, 13:00-17:00, and 18:00-20:00, with 10 orders per day, some of which were taken during peak hours. This resulted in a salary of 16,800,000, which met Mr. Rusmana's minimum salary requirement. In the second answer, assuming 20 working days, orders were taken from 06:00-09:00 and 16:00-17:00, with 4 orders per day, all of which were taken during peak hours.

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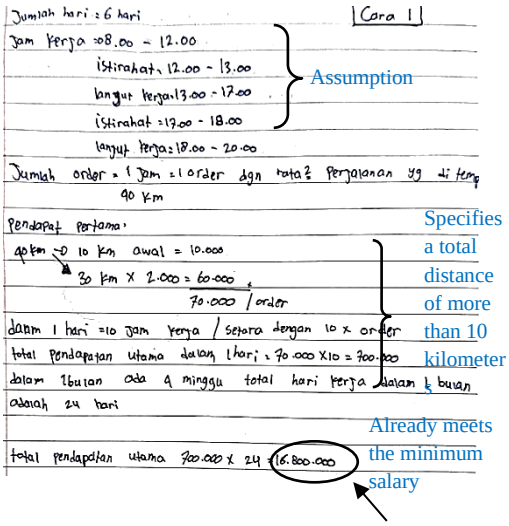

Figure 4. SNS's test results using method 1

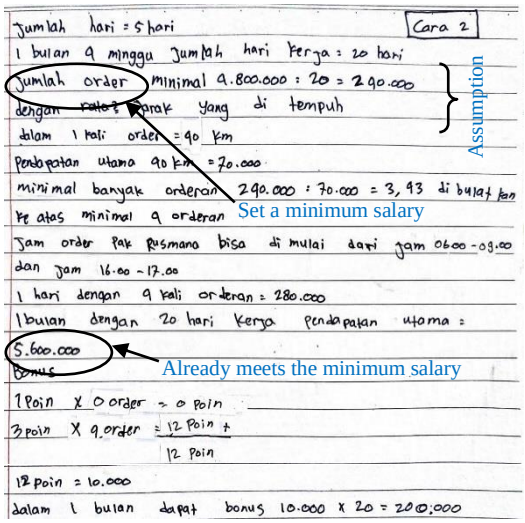

Figure 5. SNS's test results using method 2

This resulted in a salary of 5,600,000, which also met the minimum salary requirement. Thus, SNS was able to produce two different answers with different assumptions, both of which met the minimum salary requirement.

In the flexibility aspect, with the indicator of using more than one method to achieve the minimum salary, SNS applied two different approaches. In the first method, SNS directly determined the total distance for each order as more than 10 km, totaling 40 km. In contrast, in the second method, SNS established the minimum salary first and then divided it by the number of working days. This resulted in a daily target for Mr. Rusmana of 240,000. Based on this daily target, Mr. Rusmana needed to complete a minimum of 4 orders per day. Therefore, SNS used three different methods to solve the problem.

In the originality aspect, SNS used an approach of determining the number of orders per day by dividing the minimum salary by the number of working days. This approach was considered unique because the student did not directly determine the number of working days.

In the elaboration aspect, with the indicator of writing detailed assumptions and solving the problem systematically, SNS was very thorough. In all three answers, SNS was able to calculate main income, bonus points, and total daily income with clear steps. SNS also provided a detailed explanation about the division of work hours and Mr. Rusmana's daily target.

Based on the presentation of the answers and interviews above, SNS demonstrated all four aspects of the creative thinking indicators.

B. DISCUSSION

1. Creative Thinking Ability of Students with a Theoretical Learning Style in Problem-Solving

In the fluency aspect, students with a theoretical learning style were able to generate various solutions based on different assumptions. The assumptions used were also based on prior knowledge. A student with a theoretical learning style was able to come up with three different solutions based on assumptions about the number of working days, working hours, and travel

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distance. Two of the three solutions met the minimum salary requirement, while one did not. This indicates that students with a theoretical learning style are capable of producing many logical, structured ideas supported by assumption data. This is in line with Bhatnagar & Sinha (2018), who stated that students with a theoretical learning style solve problems vertically, step by step, in a logical manner.

In the flexibility aspect, students with a theoretical learning style were able to use more than one approach to solve the problem. For example, in the first method through to the third method, the student varied the approach, starting from determining the distance per order, calculating the total distance, and then utilizing average speed and peak hours. These variations reflect the ability of students with a theoretical learning style to adapt to problem conditions and seek alternative solutions.

In the originality aspect, students with a theoretical learning style demonstrated strong analytical skills; however, their originality in the solutions produced was relatively low. This aligns with Ferdiani (2024), who stated that students with a theoretical learning style tend to be cautious in making decisions. Before making a decision, they usually analyze and study theories by reading books. The approaches used tend to be conventional, such as calculations based on logical assumptions, which are relevant but not innovative. No new strategies or creative thinking patterns stood out in the solutions provided, which is consistent with the nature of the theoretical learning style, which is more focused on logic and structure than innovation.

In the elaboration aspect, students with a theoretical learning style demonstrated excellent elaboration skills, with detailed and systematic steps in each solution provided. The explanation covered assumptions, main income calculations, bonus points, and total daily income. This detailed explanation reflects the perfectionist and structured tendency of the theoretical learning style.

2. Creative Thinking Ability of Students with a Pragmatic Learning Style in Problem-Solving

In the fluency aspect, students with a pragmatic learning style were able to generate various answers that met the goal of achieving the minimum salary for Mr. Rusmana. With assumptions about the number of working days, working hours, and the number of orders per day, the student generated two different solutions. Both solutions demonstrated the student's ability to quickly generate various alternative solutions.

In the flexibility aspect, students with a pragmatic learning style showed flexibility by using two different approaches: the first approach directly determined the total distance of each order as more than 10 km per order to maximize income. The second approach had the student set the minimum salary first, then divide it by the number of working days to determine the required number of daily orders. This differing approach reflects the pragmatic learning style's ability to adapt and find practical ways to solve problems. This is in line with Ferdiani (2024), who noted that students with a pragmatic learning style are cheerful, enthusiastic, and practical thinkers, preferring to avoid complications.

In the originality aspect, students with a pragmatic learning style demonstrated a unique strategy by setting the minimum salary as the basis for calculation, then determining the

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required number of daily orders. This approach differed from the traditional method of directly determining the number of working days or working hours, and was therefore considered innovative for the pragmatic learning style. This aligns with Bhatnagar & Sinha (2018), who stated that students with a pragmatic learning style actively seek new ideas and quickly attempt to implement them.

In the elaboration aspect, students with a pragmatic learning style provided detailed calculations and structured steps in their problem-solving process. The student was able to explain assumptions such as the number of working days, working hours, orders per day, and the rate per kilometer. This process included calculations of main income, bonus points, and total daily income, all presented in a clear, step-by-step manner.

CONCLUSION AND SUGGESTION

Students with a theoretical learning style demonstrated notable creative thinking abilities. In terms of fluency, they generated various logical solutions based on structured assumptions, with two out of three solutions meeting the minimum salary criteria. Regarding flexibility, they exhibited good adaptability by employing different approaches, such as modifying assumptions about distance or using average speed. However, no evidence of originality was observed, as the solutions provided were conventional and lacked innovative elements. In the aspect of elaboration, students were able to deliver detailed and systematic explanations, reflecting an organized thought process.

On the other hand, students with a pragmatic learning style exhibited strong creative thinking skills. For fluency, they efficiently produced two distinct solutions that met the minimum salary target. Their flexibility was evident in their ability to utilize two different approaches: directly determining the required distance or dividing the minimum salary by the number of working days. In terms of originality, they employed a unique strategy by prioritizing the minimum salary before calculating the required number of daily orders, which deviated from conventional methods. For elaboration, their calculations were thorough, including detailed assumptions about the number of working days, working hours, and the rate per kilometer.

In Based on the findings of this study, it is recommended that teachers design exercises aimed at developing all indicators of creative thinking, including fluency, flexibility, originality, and elaboration. These exercises can help improve the quality and diversity of students' solutions, particularly for those with theoretical learning styles who tend to provide structured but less innovative solutions, as well as for students with pragmatic learning styles who produce practical solutions but are sometimes limited by the accuracy of their assumptions.

Furthermore, for future researchers, it is suggested to develop mathematical problems with multiple solutions that are more effective in eliciting components of creative thinking, particularly originality and flexibility. More challenging problems can encourage students to explore various approaches to problem-solving, resulting in more diverse and reflective answers that demonstrate their creative potential. Future studies could also examine creative thinking skills in relation to other learning styles, such as activist and reflective learning styles, to

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gain a more comprehensive understanding of the relationship between learning styles and creativity.

DAFTAR PUSTAKA

Bhatnagar, T., & Sinha, V. (2018). Learning styles: A comparison between indian and german business students. *Journal of International Students*, *8*(1), 473–487. https://doi.org/10.5281/zenodo.1134345

Cristóvão, A. M., Candeias, A. A., & Verdasca, J. L. (2020). Development of Socio-Emotional and Creative Skills in Primary Education: Teachers' Perceptions About the Gulbenkian XXI School Learning Communities Project. *Frontiers in Education*, *4*(January). https://doi.org/10.3389/feduc.2019.00160

Cropley, D. H., & Cropley, A. J. (2019). Creativity and Malevolence. In *The Cambridge Handbook of Creativity* (pp. 677–690). Cambridge University Press. https://doi.org/10.1017/9781316979839.034

Cropley, J. A. (1992). *More ways than one : fostering creativity*. Norwood, N.J. : Ablex Pub.

Ferdiani, R. D. (2024). Honey and Mumford: Application of interactive e-LKPD to improve students' creative thinking abilities. *Pythagoras: Jurnal Program Studi Pendidikan Matematika*.

Ferdiani, R. D., & Harianto, W. (2024). Honey and Mumford learning style: creative thinking process in solving statistical problems. *International Journal of Evaluation and Research in Education* , *13*(1), 496–502. https://doi.org/10.11591/ijere.v13i1.25347

Ferdiani, R. D., Manuharawati, & Khabibah, S. (2023). Activist Learners' Creative Thinking Processes in Posing and Solving Geometry Problem. *European Journal of Educational Research*, *12*(2), 749–758.

Fitria, N. A., Julyanur, M. Y., & Widyanti, E. (2024). Analisis Langkah-Langkah Evaluasi Dalam Proses Belajar Mengajar. *Journal Of Islamic Studies*, *1*(1). https://ejournal.hsnpublisher.id/index.php/qazi

Florentina, N., & Leonard. (2017). Pengaruh Model Pembelajaran Koorperatif terhadap Kemampuan Berpikir Kreatif Matematis Siswa. *Jurnal Formatif*, *7*(2), 96–106.

Florida, R., Mellander, C., & King, K. (2015). The Global Creativity Index 2015. *Martin Prosperity Institute*.

Honey, P., & Mumford, A. (2006). *The learning styles helper's guide*. Maidenhead : Peter Honey Publications Ltd.

Ishak, A. (2024). Constructivist Beliefs And The Attitudes Towards Computers As Predictors Of Classroom Technology Use Amongst Pre-Service Teachers. *Malaysian Online Journal of Educational Technology*, *12*(1), 55–66. https://doi.org/10.52380/mojet.2024.12.1.506

Khoo, N. A., Jamaluddin, N. Y., Osman, S., & Buchori, A. (2024). Exploring The Interaction Between Learning Styles and Mathematics Anxiety

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i4.9884

Among Secondary School Students: A Correlational Ttudy in Southern Malaysia. *Journal of Technology and Science Education*, *14*(3), 683–700. https://doi.org/10.3926/jotse.2224

Manazila, S. I., Isnarto, I., Kharisudin, I., Zaenuri, Z., & Waluya, S. B. (2022). Kemampuan Berpikir Kreatif Berdasarkan Tipe Adversity Quotient pada Pembelajaran Matematika. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 1788–1796. https://doi.org/10.31004/cendekia.v6i2.1059

Ni'mah, N., & Shodikin, A. (2022). Analysis of Students' Creative Thinking in Solving Problems Opportunities Based On Students' Learning. *Hipotenusa Journal of Research Mathematics Education (HJRME)*, *5*(1), 1–11. https://doi.org/10.36269/hjrme.v5i1.733

Novita, R., & Putra, M. (2016). Using Task Like Pisa's Problem to Support Student's Creativity in Mathematics. *Journal on Mathematics Education*, *7*(1), 33–44.

OECD. (2023). *PISA 2022 Results (Volume I) : The State of Learning and Equity in Education: Vol. I*. OECD. https://doi.org/10.1787/53f23881-en

Pratiwi, I., Amaliyah, A., & Puspita Rini, C. (2021). Analisis Kemampuan Berpikir Kreatif Matematis Siswa dalam Menyelesaikan Soal Cerita di Kelas IV MI Al-Kamil Kota Tangerang. *Berajah Journal*, *2*(1), 1–5. https://doi.org/10.47353/bj.v2i1.43

Puspitasari, L., In'am, A., & Syaifuddin, M. (2018). Analysis of Students' Creative Thinking in Solving Arithmetic Problems. *International Electronic Journal of Mathematics Education*, *14*(1), 49–60. https://doi.org/10.12973/iejme/3962

Rohati, R., Kusumah, Y. S., & Kusnandi, K. (2023). *education sciences Exploring Students ' Mathematical Reasoning Behavior in Junior High Schools : A Grounded Theory*.

Siraj, M. N., & Nuriadin, I. (2022). Students' Creative Thinking Analysis of SPLTV Materials Through Virtual Learning Reviewed from Beginning Mathematics Ability. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *11*(1), 630. https://doi.org/10.24127/ajpm.v11i1.4673

Siswono, T. (2005). Upaya meningkatkan kemampuan berpikir kreatif siswa melalui pengajuan masalah. *Jurnal Pendidikan Matematika Dan Sains*.

Siswono, T. (2018). *Pembelajaran Matematika Berbasis Pengajuan dan Pemecahan Masalah*. Remaja Rosdakarya PT.

Sutrisno, T., Eva, L. M., & Werdiningsih, C. E. (2019). Pengaruh Kreativitas Belajar dan Kemandirian Belajar Siswa terhadap Kemampuan Pemecahan Masalah Matematika. *JKPM (Jurnal Kajian Pendidikan Matematika)*, *5*(1), 117. https://doi.org/10.30998/jkpm.v5i1.5329

Taş, H., & Minaz, M. B. (2024). The Effects of Learning Style-Based Differentiated Instructional

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i4.9884

Activities on Academic Achievement and Learning Retention in the Social Studies Course. *Sage Open*, *14*(2). https://doi.org/10.1177/21582440241249290

The National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. The National Council of Teachers of Mathematics, Inc.

Widiastuti, Y., Ilma, R., & Putri, I. (2018). Kemampuan Berpikir Kreatif Siswa Pada Pembelajaran Operasi Pecahan Menggunakan Pendekatan Open-Ended. *Jurnal Pendidikan Matematika*, *12*(2), 13–22.