
ANALYSIS OF STUDENTS' CREATIVE THINKING ABILITY AND LEARNING INDEPENDENCE IN SOLVING STORY PROBLEMS ON THE SUBJECT OF LINEAR EQUATIONS WITH TWO VARIABLES (SPLDV)

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Abstrak

Penelitian dilatarbelakangi oleh adanya kurangnya kemampuan berpikir kreatif dan kemandirian belajar siswa dalam menyelesaikan soal cerita pada materi SPLDV. Tujuan penelitian ini adalah untuk mendeskripsikan: (1) Kemampuan berpikir kreatif siswa dalam menyelesaikan soal cerita pada materi SPLDV kelas VIII di SMP Negeri 4 Maniamolo, (2) kemandirian belajar siswa dalam menyelesaikan soal cerita pada materi SPLDV kelas VIII di SMP Negeri 4 Maniamolo. Jenis penelitian ini adalah penelitian kualitatif dengan pendekatan deskriptif. Subjek dalam penelitian ini adalah siswa kelas VIII SMP Negeri 4 Maniamolo yang berjumlah 25 orang. Pengumpulan data dilakukan dengan tes, angket dan wawancara. Data dianalisa dengan tahapan yaitu reduksi data, penyajian data dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa kemampuan berpikir kreatif dalam menyelesaikan soal cerita pada materi SPLDV tergolong kurang, yaitu kategori sangat baik sebesar 8%, kategori baik sebesar 16%, kategori cukup sebesar 28%, kategori kurang sebesar 36% dan kategori kurang baik sebesar 12%. Untuk hasil penelitian menunjukan bahwa kemandirian belajar dalam menyelesaikan soal cerita pada materi SPLDV tergolong sedang, yaitu kategori tinggi sebesar 8%, kategori sedang sebesar 56% dan kategori rendah rendah 36%. Maka dapat disimpulkan bahwa kemampuan berpikir kreatif siswa lebih dominan pada kategori cukup dan kemandirian belajar siswa juga masih domain pada kategori sedang. Saran yang diajukan pada penelitian ini adalah diharapkan siswa mampu mengembangkan tingkat berpikir agar lebih aktif dan lebih banyak berlatih menyelesaikan soal matematika yang berkaitan dengan materi SPLDV, dan guru sebaiknya dapat mengembangkan kemampuan berpikir kreatif siswa dan meningkatkan kemandirian belajar siswa dalam menyelesaikan soal cerita pada materi SPLDV.

Kata Kunci: Analisis kemampuan berpikir kreatif siswa; kemandirian belajar siswa; soal cerita pada materi SPLDV

Abstract

The research was motivated by the lack of students' creative thinking abilities and independent learning in solving story problems on SPLDV material. The aim of this research is to describe: (1) Students' thinking abilities in solving story problems in class VIII SPLDV

material at SMP Negeri 4 Maniamolo, (2) Students' learning independence in solving story problems in class VIII SPLDV material at SMP Negeri 4 Maniamolo. This type of research is qualitative research with a descriptive approach. The subjects in this research were 25 class VIII students of SMP Negeri 4 Maniamolo. Data collection was carried out using tests, questionnaires and interviews. The data was analyzed in stages, namely data reduction, data presentation and drawing conclusions. The research results show that the ability to think creatively in solving story problems on SPLDV material is classified as poor, namely the very good category at 8%, the good category at 16%, the fair category at 28%, the poor category at 36% and the poor category at 12%. The research results show that learning independence in solving story problems on SPLDV material is classified as moderate, namely the high category at 8%, the medium category at 56% and the low category at 36%. So it can be concluded that students' creative thinking abilities are more dominant in the sufficient category and students' learning independence is also still dominant in the moderate category. The suggestions put forward in this research are that it is hoped that students will be able to develop their level of thinking to be more active and have more practice solving math problems related to SPLDV material, and teachers should be able to develop students' creative thinking abilities and increase students' learning independence in solving story problems on SPLDV material.

Keywords: Analysis of students' creative thinking abilities; student learning independence; story questions on SPLDV material.

A. Introduction

Education is a fundamental human need that must be fulfilled, driven by higher reasons beyond mere existence. Learning is an inseparable component of human life. From infancy through adulthood and into old age, individuals undergo a cycle of education influenced by parents, society, and their current circumstances. According to Sutikno (2007:79), "Education is a process of teaching that influences students to adapt as best as possible to their environment, leading to changes within themselves." Education also serves to guide individuals in determining the direction, goals, and significance of life.

Through education, individuals acquire various experiences as a foundation for developing their potential through teaching methods or other socially recognized means. Education can be received in both formal and informal settings. Formal education is structured in layers, starting from elementary school (SD), junior high school (SMP), senior high school (SMA), to higher education.

Schools are one of the formal educational institutions where the teaching and learning process occurs. According to the KBBI (2008:1286), "A school is a platform or foundation for learning and a place to receive and provide lessons." It can be concluded that schools serve as discussion

spaces for students and teachers to engage in education and enriching experiences aimed at broadening their horizons. In this educational process, there are various subjects taught.

Mathematics is a subject that all students must learn at every educational level. Fundamentally, mathematics is a critical field of knowledge in daily life and surprisingly, in the advancement of science, such as in understanding and addressing social and financial issues. Susanto (2014:186-187) states, "Mathematics learning is a teaching process built by teachers to develop students' creative thinking, which can enhance their thinking abilities and help them construct new knowledge to better understand mathematical material." Thus, it is essential to teach mathematics to help students develop their inherent abilities, including creative thinking skills.

Creative thinking skills are crucial when students perform tasks, search for, select, receive, and manage information to solve problems. Siswono (2005:15) describes creative thinking as "students' ability to understand a problem and find solutions using various techniques and systems." Creative thinking is also a process of generating or producing new ideas in solving mathematical problems.

In line with the educational context at SMP Negeri 4 Maniamolo, during the

mathematics learning material discussing systems of linear equations with two variables (SPLDV), the researcher provided a test based on indicators of creative thinking ability consisting of 5 questions. These test questions reveal the degree of students' inventive reasoning abilities. Based on the completed tests, it is evident that there are various solutions expressed in their own language or new ideas in problem-solving, demonstrating independence without reliance on others. One of the questions posed to students regarding the system of linear equations with two variables (SPLDV) was as follows: A officer received Rp 18,000 from 4 cars and 2 motorcycles, while from 3 cars and 5 motorcycles, he received Rp 17,000. If there are 10 cars and 15 motorcycles, how much cash does he have left?

Figure 1: Student Test Results

3.

$x = \text{mobil}$
 $y = \text{motor}$

misal:

$$\begin{aligned} 4x + 2y &= 18.000 \\ 3x + 5y &= 17.000 \end{aligned}$$
$$\begin{aligned} 12x + 6y &= 54.000 \\ 12x + 20y &= 68.000 \\ \hline -14y &= -14.000 \\ 14y &= 14 \\ y &= 1.000 \end{aligned}$$

Sumber: Peneliti 2023

This can be observed from the student test results, indicating that students are still inadequately prepared to solve mathematical test problems. This is evident from the

incorrect answers and their inability to generate new ideas in their solutions. Therefore, it can be concluded that students' creative thinking abilities are still very low when it comes to solving math problems.

In the teaching and learning process, teachers should occasionally provide open-ended problems to stimulate students' creative thinking abilities. By addressing these problems, we can assess the extent of students' creative thinking skills and help them become accustomed to solving issues using their own methods. Creativity, or creative thinking, is the ability to see various possible solutions to a problem. Students' thinking abilities are closely related to learning independence, which ideally allows them to develop their capacities.

This independence in learning indirectly encourages students to solve relevant mathematical problems without relying on others. Learning independence is an essential mindset that students must possess to avoid depending on others when facing challenges, enabling them to use their own ideas. According to KBBI (2008:876), "Independence is a condition that has the option to remain solitary without relying on others." Rusman (2010:354) states, "Learning independence implies that students can engage in study practices based on their own efforts, obligations, and motivations."

Thus, learning independence is also a crucial factor to consider in determining students' achievement outcomes in the teaching and learning process. Independent learning occurs when students actively attempt to solve complex mathematical problems using their own ideas without waiting for others' answers.

Based on the researcher's observations, including interviews at SMP Negeri 4 Maniamolo, it was found that students are still lacking in learning independence. They tend to rely solely on the explanations provided by teachers and struggle to create and develop new ideas during the learning process. Consequently, the researcher is interested in conducting a study titled "Analysis of Creative Thinking Ability and Learning Independence of Students in Solving Story Problems on the Subject of SPLDV for Class VIII at SMP Negeri 4 Maniamolo"

B. Research Method

The research approach used in this study is descriptive. Descriptive research aims to investigate the state or condition of a subject, with the results presented in the form of a research report (Arikunto, 2014:3).

The type of research employed in this study is qualitative research using descriptive analysis methods. According to Sugiyono (2012:9), "Qualitative research methods are based on postpositivist

philosophy, used to study natural conditions of objects, where the researcher is the key instrument, data collection techniques involve triangulation, data analysis is inductive/qualitative, and the results emphasize meaning rather than generalization." The researcher chose qualitative research because the aim of this study is to analyze the creative thinking abilities and self-directed learning of students in solving story problems related to the material of linear equations in two variables (SPLDV) at SMP Negeri 4 Maniamolo.

This research was conducted at SMP Negeri 4 Maniamolo in grade VIII, located in Hilisimaetano village, Maniamolo sub-district, South Nias district, during the 2023/2024 academic year. The research was conducted in the odd semester from September 6 to 25, 2023.

The data used in this research is primary data. According to Subagyo (2006:87), "Primary data is data obtained directly from informants through questionnaires, tests, interviews, and observations." The data used in this study includes test results, questionnaire results, and student interview results.

The collection of information in this research is expected to produce reliable data regarding students' imaginative capabilities in reasoning and their freedom to learn when

addressing story problems related to the SPLDV material. The techniques used to collect information in this study are:

1. Creative Thinking Ability Test for Students

This test was prepared by the author to assess students' creative thinking abilities. It is aligned with the SPLDV material, including the test framework, weight table, test questions, and answer key. There are a total of 5 questions. The aim of this test is to evaluate students' innovative reasoning abilities.

After administering the initial test to students, the degree of imaginative reasoning ability of grade VIII students at SMP Negeri 4 Maniamolo on SPLDV material will be determined based on indicators, using the following formula:
$$NP = \frac{R}{SM} \times 100\%$$

$$NP = SMR \times 100\%$$

Where:

NP = percentage score

R = raw score obtained

SM = maximum score

2. Student Self-Directed Learning Questionnaire

The questionnaire consists of various written questions, containing interconnected elements that can be filled out by the research respondents, namely the grade VIII students at SMP Negeri 4 Maniamolo. There are 6 indicators of student self-directed

learning covered in 22 questionnaire items, including independence from others, self-confidence, disciplined behavior, sense of responsibility, initiative, and self-control. The questionnaire includes instructions for completion and response options, which consist of five choices: strongly agree, agree, unsure, disagree, and strongly disagree. Students will mark their answers using check marks next to the options that correspond to the questions in the self-directed learning questionnaire.

3. Interviews

One of the data collection techniques used in this study is interviews. An interview is a process of conversation, either direct or indirect, conducted through question and answer to obtain information. According to Saffawati (2019:54), "An interview is a meeting between two or more people to exchange ideas and information through question and answer, allowing the construction of meaning on a specific topic." Interviews are used to assess students' creative thinking abilities and self-directed learning. The interview process is conducted with grade VIII students at SMP Negeri 4 Maniamolo.

In qualitative research, data analysis is performed during and after data collection over a specified period. The data analysis technique follows the steps proposed by Emzir (2012:129-135), which includes three

simultaneous activities: (1) Data reduction, (2) Data display, and (3) Conclusion drawing (verification). This research employs the following data analysis methods:

Data Reduction Data reduction is a common method for abstracting, refining, and transforming raw information from the field. This cycle occurs throughout the examination, starting from conceptualization, problem identification, to data collection approaches. This may involve summarizing, coding, topic creation, grouping, and announcing findings. Reduction is crucial for examination, enhancing the ability to classify, direct, eliminate irrelevant information, and organize data for interpretation.

Data Display Data display is a collection of data that provides the potential for making decisions from the information and taking action. Forms of display include narrative text, frameworks, diagrams, organizations, and outlines. The aim is to make it easier to read and reach conclusions. Therefore, the presentation must be organized conveniently. Information display is also essential for investigation and includes aspects of data reduction. This phase groups similar items into categories, such as group one, group two, group three, and so on. Each group represents the latest typology according to the details of the problem. Each typology may consist of sub-

typologies that could be a grouping or a necessity of events.

Conclusion Drawing (Verification)

Drawing conclusions is critical for a single movement and a complete arrangement. Conclusions are also scrutinized during exploration. The implications arising from the information should continuously be tested for reality and feasibility to ensure their legitimacy. At this stage, specialists provide recommendations related to consistent standards, accepting them as findings from the investigation, repeatedly auditing existing information, compiling formed data, and creating recommendations. The next step is to report the overall findings of the investigation along with new discoveries..

C. Research Results and Discussion

This study was conducted at SMP Negeri 4 Maniamolo, involving 25 grade VIII students as subjects. Before administering the test, the researcher prepared various instruments, including questionnaires, interview guidelines, test frameworks, test scripts, and answer keys. Subsequently, the research instruments were reviewed and approved by three validators, which included specific science instructors. Based on their approval, it was assumed that the test and interview guidelines developed by the researcher were appropriate to be used as research instruments.

The results of the students' creative thinking abilities are presented in the following table:

Table 1. Categories of Students' Creative Thinking Ability Test Scores

Category	Interval	Jumlah Siswa	Presentase
Very Good	81-100	2	8%
Good	61-80	4	16%
Satisfactory	41-60	7	28%
Poor	21-40	9	36%
Very Poor	0-20	3	12%

Source: Researcher, 2023

Sesudah siswa selesai mengerjakan tes, maka selanjutnya penelitian memberikan angket kemandirian belajar siswa kemudian dipilah atas 3 kelompok yaitu kelompok tinggi, kelompok sedang dan kelompok rendah.

Table 2. Categories of Students' Learning Independence

N	Interv	Learning	Numbe	Percenta
o	al	Independen	r of	ge
		ce	Studen	
			ts	
1	81-100	High	2	8%
2	63-80	Medium	14	56%
3	20-62	Low	9	36%
Total			25	

Source: Researcher, 2023

Based on Table 2 above, it shows that students with high learning independence account for 8%, with a total of 2 students; those with medium learning independence account for 56%, with 14 students; and those with low learning independence account for 36%, with 9 students. Thus, it can be concluded that the students' learning

independence is predominantly in the medium category.

Following these findings, the discussion will focus on the creative thinking abilities and learning independence of eighth-grade students at SMP Negeri 4 Maniamolo.

1. High Creative Thinking Ability and Learning Independence

Based on the research findings, the results of the students' tests reflect their imaginative reasoning abilities and high levels of learning independence in addressing story problems related to the SPLDV material. Students with strong understanding can solve problems accurately; however, the interactions they employ may be less precise. While most answers are correct, one critical step is often missed: revisiting each idea. Students tend to forget to record known information and questions, as they are overly confident and rush through the process. This oversight highlights the importance of documenting information when solving story problems for additional clarity.

The issues arise particularly when students apply specific properties to the SPLDV problems. Although they work diligently, the haste in completing the tasks affects their precision.

2. Moderate Creative Thinking Ability and Learning Independence

The findings indicate that students exhibiting moderate imaginative reasoning and learning independence engage with story problems in the SPLDV material but do not fully meet the ideal guidelines. These students can record known information and what is being asked in the problems, yet they struggle with accurately determining the implications of the problems during the final stages of investigation.

3. Low Creative Thinking Ability and Learning Independence

The research highlights that students with low imaginative reasoning skills and limited independence struggle with story problems in the SPLDV material. These students often approach problems without articulating what they know or what is being asked. Throughout the problem-solving process, they lack the ability to provide explanations at each stage.

Students with low learning independence tend to display passive learning behaviors. They struggle with self-regulation and are unable to take initiative in problem-solving, often relying on others for assistance. Consequently, indicators of learning independence remain unachieved.

D. Conclusion

Based on the analysis of data and discussion regarding students' creative thinking abilities in solving story problems related to the SPLDV material for eighth grade at SMP Negeri 4 Maniamolo, the findings indicate that students' creative thinking abilities are categorized as follows: very good at 8% (2 students), good at 16% (4 students), sufficient at 28% (7 students), poor at 36% (9 students), and very poor at 12% (3 students). Therefore, it can be concluded that students' creative thinking abilities predominantly fall within the poor category.

Regarding the results of the study on students' learning independence in solving story problems for the SPLDV material, involving 25 students, the categorization reveals high independence at 8% (2 students), moderate at 56% (14 students), and low at 36% (9 students). Thus, it can be concluded that students' learning independence is predominantly in the moderate category.

Several suggestions from the researcher are as follows:

By frequently practicing problem-solving and asking challenging questions to teachers, students are expected to enhance their skills in creative thinking related to mathematics problems, particularly in the context of SPLDV story problems. This approach should also improve students' learning independence in mathematics.

To help students avoid repeated mistakes, teachers should instruct them on how to solve mathematical problems, especially those related to story problems in the SPLDV material. Additionally, teachers should challenge students with stimulating questions to further develop their creative thinking abilities. It is also essential for educators to tailor instructions according to various indicators of students' learning independence.

It is hoped that this research can serve as an example and inspiration for other researchers who wish to explore related topics.

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