Evaluation of Students' Creative Thinking Ability in Solving Fraction Problems in Class V of Elementary School

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Abstract

Students with the ability to think creatively mathematically will receive more attention inside and outside the classroom, but the mathematics learning results obtained by students show unsatisfactory results, especially in solving problems. The objectives of this research are: 1) evaluating students' creative thinking abilities, 2) analyzing factors that inhibit students' creative thinking abilities. This research uses a qualitative type of research using the CIPP approach. The subject of this research was carried out in fifth grade elementary school with sub-subject material regarding fraction calculation operations. Data collection techniques use questionnaires, interviews and test questions. Data validation uses triangulation of sources and methods, with data analysis techniques using 4 research stages from Miles and Hubeman. The results are: 1) evaluation of creative thinking abilities on fluency indicators obtained as a percentage79.04%, flexibility obtained 64.44%, novelty obtained 63.33%, and detail 79.00%, these results show that students are creative in the learning process, not in problem solving activities in questions; 2) the causal factors are low understanding regarding the concept of multiplication calculation operations on fractions with different denominators, highshyness in conveying ideas, lack of practice and involvement in the learning process. In conclusion: the results of the KBK evaluation show that there is a tendency for learning activities to always focus on the teacher, students are more inclined to understand questions based on the example questions that are indicated, the concept of arithmetic operations is not mastered, understanding of the questions is lacking, and they tend to focus on obtaining learning outcomes rather than on the process learning.

Keywords :*Mathematics Learning, Creative Thinking Ability, Learning Evaluation*

INTRODUCTION

Education is a means of developing human resources so that they have the ability to think logically, critically, creatively, take initiative and be adaptive to changing times, especially in learning mathematics. Ayu (2018) stated that mathematics is a learning that is closely related to everyday life. Yeni (2018) also said that mathematics learning needs to be given to students starting from elementary school level to equip students to think critically, logically, analytically and creatively and be able to work together so that they have the ability to obtain, process and utilize information. This is in accordance with the Republic of Indonesia Minister of National Education Regulation No. 19 of 2005 concerning National Education Standards article 1 no. 14, related to the aim of learning mathematics, namely that students can solve problems which include the ability to understand problems, design mathematical models, complete models and interpret the solutions obtained and have an attitude of appreciating the usefulness of mathematics in life, namely having curiosity, attention and interest in mathematics lessons, as well as a tenacious and confident attitude in solving fraction problems (Yayah Huliatunisa, et al. 2019). Therefore, creativity in studying mathematics is one of the important things that must be mastered.

The ability to think creatively is one of the skills that students must have and master, including those at the elementary school level. Afriansyah (2017) states that creative thinking is a high-level thinking ability or High Order Thinking (HOT that must be possessed by students. Rusma in Ikhsan (2020) states that creative thinking is a learning process that requires teachers to be able to motivate and bring out creativity in participants. students during learning, which can be done using several varied methods and strategies. Yayah (2019) stated that choosing the right techniques and strategies helps students solve problems easily.

The hope is that students who have the ability to think creatively mathematically will receive more attention, both inside and outside the classroom. However, in reality, the results of mathematics learning for students in

elementary schools show satisfactory results. This can be seen from the results of observations made that there are still teachers who apply the lecture method so that students become passive, questions from students appear less, they are focused on one correct answer, because students' learning activities are still dominated by exercises to achieve basic mathematical skills. This is one of the causes of students' lack of interest in learning mathematics which has a negative impact on creative thinking abilities because students are not given the opportunity to find out, ask, answer and reason and even express their own opinions. This results in a lack of interaction between students and teachers where a teacher does not provide space for students to explore new ideas with creative thinking skills (Farida, et al., 2018).

Mathematics learning that takes place in the classroom should be able to direct students to be able to think creatively, but in reality in the field the learning carried out is still conventional, there are no learning tools that support creative thinking in students. Apart from that, learning mathematics is considered a difficult, scary subject and even a threat to students. Ayu (2018) stated that these conditions make it difficult to encourage students to improve their creative thinking abilities. This is one of the causes of students' lack of interest in learning mathematics which has a negative impact on creative thinking abilities, because students are not given the opportunity to find out, ask, answer and reason and even express their own opinions. This results in a lack of interaction and no space to explore new ideas (Farida, et al., 2018).

Therefore, to find the cause of this problem, it is necessary to evaluate students' creative thinking abilities in solving problems using the CIPP (Control-input-process-product) model. The aim is so that teachers can make decisions to improve the mathematics learning process better and have an impact on student learning outcomes. The CIPP model provides an overview and structure for evaluating the success or failure of a program. The CIPP model has special components in evaluation, namely context, input, process and product. (Zhang., 2011). There are 4 types of CIPP model evaluation including: 1) Context evaluation, carried out to evaluate students' thinking abilities in solving fraction problems in the mathematics learning process; 2) Input evaluation is carried out to evaluate students' creative thinking abilities in solving mathematics problems using fraction material. Apart from that, this evaluation is also related to students' abilities in solving problems; 3) Process evaluation is carried out to evaluate the implementation of the program that has been designed by the institution in the process of solving fraction problems. This process evaluation includes evaluation of learning tools, learning models, learning facilities, and the feasibility of the learning process; 4) Evaluation of results, carried out to evaluate the results of students' creative thinking abilities in solving fraction problems that meet the established standards (Sulffbeam., 2003)

One way that can be used to evaluate students' creative thinking abilities is through giving questions. One of the questions that can be used to analyze students' creative thinking abilities is using fraction questions. Fraction material is generally the main material in mathematics in the curriculum taught to fifth grade elementary school students, with the main discussion relating to fraction calculation operations. Januar (2018) stated that mathematical fraction calculation operations include aspects of the ability to read, reason, analyze and find solutions, for this reason students are required to master the ability to solve fraction problems.

The results of research conducted by Farida (2018) show that learning the concept of fractions through the application of the RME approach shows an increase in creative thinking abilities in fourth grade elementary school students with an average KKM achievement of 57.14% and 89.29% in the implementation of cycles I and II . Furthermore, the results of research conducted by Fita (2023) show that the level of students' creative thinking abilities in solving fraction problems has different levels with different levels of understanding in solving problems. The difference between the research carried

out by researchers and previous research lies in the research procedures, where researchers are now more focused on evaluating students' creative thinking abilities in solving problems. Based on this description, researchers further evaluated students' creative thinking abilities in solving fraction problems in elementary school. The objectives of this research are: 1) evaluating students' creative thinking abilities based on assessment indicators, 2) analyzing factors that both support and inhibit students' creative thinking abilities in solving problems.

RESEARCH METHODS

This research is a type of qualitative research using the CIPP (Control-input-process-product) approach. The CIPP approach is one of the evaluation models used by experts developed by Stufflebeam. The uniqueness of this model lies in each type of evaluation in decision-making tools related to the planning and operations of a program. The advantage of the CIPP approach is that it provides a comprehensive evaluation format at each stage of the evaluation (Ihwan., 2011). Furthermore, in analyzing the level of students' creativity in answering questions, it can be measured using four indicators of critical thinking ability, including: 1) thinking fluently (fluency), generating lots of answers, ideas and solving problems, 2) thinking flexibly (flexibility), generating ideas. or varied answers, thinking 3) originality, being able to modify or create new combinations of parts or elements, and 4) thinking in detail (elaboration), adding or detailing details of an object, idea or situation so that it becomes better (Darwanto, 2019).

The subjects of this research are class V elementary school students for the 2023/2024 academic year. The material analyzed is about the operations of adding and subtracting fractions with the same denominator and those with unequal (different) denominators. Data collection techniques use test questions, questionnaires and interviews. Test questions are used to measure students' creativity in solving problems, questionnaires are used to measure students' creativity in mathematics learning activities, while interviews are used to strengthen the data obtained. The data validation process uses source triangulation and method triangulation, with the data analysis stage using the research stages from Miles and Huberman through four stages of analysis which include data collection, data reduction, data presentation, and drawing conclusions (Nurwalidainismawai, 2021).

RESULTS AND DISCUSSION

The results of the evaluation of the creative thinking abilities of class V students in solving mathematics problems on fractions resulted in an evaluation achievement with an average assessment criteria of 59.03%. This assessment is classified as skilled (good) criteria. This can be seen from the students' answers in solving the questions given. Furthermore, the presentation of the results of data analysis related to students' creative thinking abilities in solving problems is described as follows.

1. **Evaluation of Students' Creative Thinking Ability in Solving Problems**

   Evaluation of students' creative thinking abilities in solving problems is important in analyzing the results of students' creativity in solving problems. This also aims to ensure that teachers can create a fun mathematics learning process while also being able to invite students to engage in argumentative dialogue regarding their perspective on the mathematics learning activities carried out. Below the researcher presents the results of the analysis and evaluation of students' creative thinking abilities which are presented in the table. CIPP evaluation.

Table 1. Evaluation of Creative Thinking Abilities from the CIPP Perspective in Mathematics Learning

No	Evaluation Component	Evaluation aspect	Research instruments	Analysis results
1.	Context (context)	class situation	Observation (document analysis)	Mathematics learning is carried out 2 times/week, activities are carried out classically, students are active during the learning process, classroom

				settings are not used, most of the learning is still focused on the teacher
2.	Input (input)	Students and teachers (learning process)	Observations, interviews	The teacher asks questions every time the lesson starts, does not use mathematical teaching aids to explain fractions, as students do not understand and master the concept of arithmetic operations, especially on fractions with different denominators, the teacher applies 2 methods in solving fraction problems, namely by using cross multiplication and looking for the KPK (fractions with different denominators) but is more focused on searching for the Corruption Eradication Committee (KPK).
3.	Process	Assignment of assignments	Observation	Work in a very orderly manner, asking questions if you don't understand the question, reading the questions repeatedly, understanding the questions better in everyday examples, lacking in the concept of understanding the material, discussing with your classmates regarding the questions, checking the answers given by the students.
4.	Products/Results (product)	learning outcomes	Assessment (test results)	Assessment is carried out objectively based on the abilities of each student, the teacher's assessment criteria are not visible

Table 1 shows that evaluation

students' creative thinking abilities in carrying out mathematics learning tend to focus on the teacher, students are more inclined to understand questions based on the examples of questions that are indicated, meaning that the examples of questions are related to everyday life, they are not used to new examples of problems, the concept of arithmetic operations is not mastered, understanding towards insufficient questions, and tends to focus on obtaining learning outcomes rather than on the learning process, including in problem solving activities. This is in line with research conducted by Saefudin (2012) which states that solving mathematical problems requires creative thinking and ideas in formulating and solving problems, where these creative ideas will develop if the class uses the right learning approach. Apart from the approach, the use of appropriate teaching aids can help develop creative abilities in each student (Kurniawati, 2018).

In simple terms, evaluating creative thinking abilities is a very basic thing in carrying out the learning process. This ensures that each process is evaluated very well and can make students more able to process ways of thinking and seeing with different views every day during the learning process. This ensures that students' creativity is honed very well. Next, the researchers presented the results of the evaluation of mathematics learning based on indicators of creative thinking abilities, including the following:

Table 2. Mathematics Learning Evaluation Achievement Criteria Based on Creative Thinking Ability Indicators

No	CBC indicator	Aspects observed	Achievement criteria	Percentage
1.	Smoothness	Found many solutions	Ask questions if you don't understand or understand the question, answer questions from the teacher in a spontaneous way (according to the topic being discussed)	79.04%

2.	Flexibility	Dealing with various ideas	Respond to statements made by the teacher, work on questions in the easiest way you can think of	64.44%
3.	Newness	The uniqueness of students' answers	Working on questions in different (short) ways, discussing solving problems to make solving problems easier	63.33%
4.	Details	A series of answers	Understand the question in detail according to the steps presented in the question	79.00%

Table 2 above shows that the indicators of creative thinking ability in carrying out mathematics learning are in the creative category with a percentage of more than 60% and less than 80%. This means that subjectively, each student has a different perception in explaining each answer/idea smoothly, flexibly and in detail, but less in generating new ideas in solving problems. Furthermore, objectively students are still focused on the example questions given, so that by giving new questions students will feel confused in solving the questions. This makes most students passive, so that they answer questions not based on good understanding but based on things they consider subjectively correct to solve the problem. This is in line with the opinion explained by Sugilar (2013) that students' creative thinking abilities will not develop well if teachers in the learning process do not actively involve students in forming or explaining a concept.

2. Factors that Influence Students' Creative Thinking Ability

The factors that influence or hinder students' ability to think creatively lie in the lack of mastery of understanding the concepts that exist in each student, including understanding concepts related to the operation of calculating fractions itself. The results of the analysis carried out on fifth grade elementary school students in solving problems were a lack of understanding regarding multiplication calculation operations. Research conducted by Arifah and Saefudin (2017) states that low conceptual understanding in students can result in failure in students in learning mathematics. On the other hand, Simamora et al (2022) also stated that one of the factors that hinders students from carrying out mathematics learning lies in their low basic knowledge of mathematics. Because in essence, the material for adding and subtracting operations to calculate fractions with different denominators, students must master the multiplication calculation operation, this is because in finding addition or subtraction with different denominators, students must master the multiplication calculation operation, while students do not master the operation calculate multiplication.

This is in line with research conducted by Kamara et al (2023) which states that the causes of hampered creative thinking abilities in students include several things including negative perceptions of Mathematics and its learning, intrinsic motivation and feelings of boredom, low understanding of basic concepts, experiencing learning loss, low self-efficacy regarding open-ended questions, low procedural understanding of open-ended questions, and inadequate teacher competence. The results of interviews conducted with teachers show that students' understanding is still very low regarding arithmetic operations. This is due to a lack of mastery of numeracy concepts at the previous grade level, so it has an impact on the next grade stage. Apart from that, other factors that hinder students' ability to think creatively are shyness in conveying ideas, lack of practice and involvement in the learning

process, and lack of repetition process resulting in students' creative thinking processes being hampered. In line with this, Ashari et al., (2023) also added that if students can express the results of their thoughts orally, then the students will gain a fairly good understanding in asking questions appropriately, as well as increasing students' understanding of each problem given. .

CONCLUSION

Based on the presentation of the research results and discussion above, it can be concluded that: 1) the results of the evaluation of students' creative thinking abilities in solving mathematics problems show that there is a tendency for learning activities to always focus on the teacher, students are more inclined to understand questions based on the examples of questions that are indicated, the concept of arithmetic operations is not mastered, there is a lack of understanding of the questions, and they tend to focus on obtaining learning outcomes rather than on the learning process. This can be seen from the average score obtained in completing it of 59.03%. On the other hand, evaluating students' creative thinking abilities in each learning activity on fluency indicators, percentages are obtained79.04%, flexibility with a percentage of 64.44%, novelty with a percentage of 63.33%, and detail 79.00%. Furthermore, 2) the inhibiting factors for students' ability to think creatively are low understanding regarding the concept of multiplication calculation operations on fractions with different denominators, highShyness in conveying ideas, lack of practice and involvement in the learning process, and lack of repetition process result in students' creative thinking processes being hampered.

Therefore, the suggestions that researchers can convey are: 1) teachers can use models, approaches, strategies and provide appropriate teaching aids in carrying out learning, this can stimulate students in honing their thinking patterns, 2) students must be involved in an active learning process by providing problems in the form of questions that are close to students' lives in various forms. This is done so that when other examples of questions are given, students do not feel confused, and as far as possible, students must be introduced to basic mathematical concepts, including the basic concepts of operations for calculating fractions, so that students do not make mistakes in explaining the correct concepts in learning mathematics.

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