

Research Article

The students' creative thinking ability in elementary schools through RME

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Received: 28 April 2023

Revised: 26 May 2023

Accepted: 23 June 2023

Available online: 30 June 2023

ABSTRACT

One of the abilities that students need to have is the ability to think creatively. This is because with this ability students can solve problems in different ways. This study aims to determine the effectiveness of RME on the results of students' creative thinking abilities in elementary schools. This type of research is experimental research. The research subjects were fourth-grade students at SD Negeri 5 Lhokseumawe. Research data was collected through a creative thinking test. In this study, the researchers observed while the model teacher as a teacher involved 20 students. Data were analyzed descriptively and qualitatively based on the results of students' creative thinking tests. The results of the study concluded that most students' creative thinking abilities were in the very creative category.

Keywords: creative-thinking; elementary schools; RME; mathematics-learning

1. INTRODUCTION

Creative thinking is classified as a high-level skill and can be seen as a continuation of core skills. Creativity plays an important role in the life cycle. Creativity needs to be developed because students need creative thinking to be able to solve problems in different ways. Creativity is a product of divergence or so-called divergent thinking (Park, 2004). The ability to think creatively is one of the six dimensions of cognitive processing ability, while the six dimensions are: knowledge, understanding, application, analysis, evaluation and creativity (Anderson and Krathwohl, 2001). The ability to think creatively is the highest cognitive thinking process and the goal of learning mathematics. The problem that hinders the development of creative thinking in the educational process is that curricula are often designed with broad material objectives so that educators are more focused on completing material than teaching methods can improve creative thinking skills (Hasanah & Surya, 2017).

One appropriate approach to developing creative thinking skills is Realistic Mathematics Education (RME). RME is an approach to learning mathematics based on the view that mathematics is a human activity (Gravemeijer, 1994). According to Freudenthal mathematics as human activity means looking for problems, organizing relevant material, making mathematical models, solving problems, finding new ideas and new understandings that are appropriate to the context (Freudenthal, 1973). Therefore, in RME learning is carried out through class discussions and group work which offers opportunities for students to share their strategies and findings with others. This way students can get ideas to improve their strategies. Students' ability to think creatively is related to the characteristics of RME, namely students build their own models or solutions (Johar et al, 2021). The problem that arises at this time is that most of the mathematics books that students study are difficult to find practice questions that lead to multiple solutions, provide examples or statements related to many mathematical concepts or situations, determination, and uniqueness of some answers (Wijaya, 2015). There are several aspects to determine student creativity in solving math problems. According to Silver (1997) creativity in solving mathematical problems is classified into three aspects, including fluency, flexibility, and novelty.

Using the RME learning model can overcome problems that have been experienced by students and teachers. Because in the learning process students are faced with understanding concepts through the use of things that are real and close to the student's environment. Thus, it is easier for students to understand the concept of the material provided (Firmansyah, 2019). Through RME, mathematics is presented as a process, namely reinventing it, thus demanding creativity and initiative (Sembiring, 2007). Students' creative thinking abilities are related to the characteristics of RME, namely students build their own models or strategies for solving them. This gives students the opportunity to actively participate in solving open problems and making decisions as expected in a democratic class (Johar et al, 2021). This concurs with Piaget's suggestion that individuals construct their own knowledge from experience and that those experiences will include the social and interactional parts of real life. The indicators of creativity in learning mathematics in measurement are

asking, producing, analyzing, and reflecting on class VI students in elementary schools (Sholeh, 2021).

Several previous studies have analyzed the application of RME. The study was conducted by Ningsih et al (2021) found that a series of learning activities with Realistic Mathematics Education (RME) with pizza and origami media can bring students from abstract situations to more real (*concrete*) situations. Students are able to work on fractional numbers in a contextual form. Therefore, this research was conducted to find out whether the use of RME is effective in increasing elementary students' creative thinking in fractional material. is the use of RME effective for students' creative thinking.

2. RESEARCH METHOD

The type of research used in this research is experimental research. The purpose of this study is to provide a good consideration of learning towards the learning process so that a theoretical reduction of empirical learning will be obtained. This research was conducted in the odd semester of the 2022/2023 academic year. The research subjects were 20 students of class IVB at SD Negeri 5 Banda Sakti. The reason for choosing the subject of this trial was based on observations made by the researcher, it was seen that some students in the class did not master mathematics well, and lacked the ability to think creatively during the learning process. Sources of data were collected from the results of creative thinking tests to see students' creativity in solving given math problems. To find out the completeness of skills in solving creative thinking questions classically can be analyzed using the percentage formula as follows:

$$\text{Percentage} = \frac{\text{Score obtained}}{\text{Ideal score}} \times 100\%$$

The percentages are then categorized by classification to describe the data obtained, based on the following criteria:

Table 1. Criteria for qualifying Student Creativity

Percentage	Criteria
0% - 20%	Not Creative
21% - 40%	Less Creative
41% - 60%	Quite Creative
61% - 80%	Creative
81% - 100%	Very Creative

3. RESULTS AND DISCUSSION

In this study of the three indicators of the ability to think creatively, only two indicators were used in the assessment process. This is because the ability of students is only limited to the material of adding simple fractions with the same denominator, so it is impossible for students to solve problems with material with different denominators. Learning activities to develop student creativity are designed in six face-to-face meetings for 2 x 35 minutes/meeting. The meeting was divided into several materials, namely two meetings for equivalent fractions, two meetings for comparing fractions and two meetings for adding up fractions with the same denominator. Details of learning activities during the four meetings are presented in **Table 2**.

Table 2. Learning Activities on Fractional Material Using the RME Approach

Indicators	Meeting	Student Activity	
Teacher fishing to answer in many ways	1	<ol style="list-style-type: none"> Choose the size of the cake on table A and table B which get the bigger cake. 	
The teacher provides opportunities for students to answer in different ways	2	<ol style="list-style-type: none"> Students arrange the fraction cards according to the size of the largest card to the smallest fraction card, then students can identify the sizes of fraction cards that have the same value. Shading the image according to the fraction presented. In this activity the teacher provides opportunities for students to be able to make decisions in shading the images that have been given to the LKPD. The teacher also provokes students to answer in various ways in drawing the shape of the fractions mentioned in the LKPD. Students try to draw various flat shapes and divide the parts so that in this activity students can build creative thinking skills. Students determine equivalent fractions by looking at the concept of how it fits to get equivalent fractions. The teacher presents some relationship problems from equivalent fractions. At the formal knowledge level students are given questions to name fractions that are equivalent to the fractions presented plus one question of creative thinking by mentioning as many fractions as 1/4 	
		3	<ol style="list-style-type: none"> Compare fractions using a fraction board. shading and drawing fractions. In this activity, the teacher tries to provoke students by answering various ways such as shading pictures on different sides so that students can form their own abilities think creatively. the teacher presents a table, students analyze the fractional parts that are close to 1, so students can find out which fractions are larger and which are smaller. In this

Teacher fishing to answer in many ways	4	activity the teacher directs students in making decisions to get the right answer. 1. the teacher presents a number line, students compare two fractions. Students compare two fractions by using the sign " $<$; $>$ and $=$ ". 2. At the formal knowledge level, students are given questions to compare the two presented fractions plus one creative thinking question by randomly matching two pairs of fractions and comparing them.
The teacher provides opportunities for students to answer in different ways	5	1. the first activity the teacher demonstrates the media that has been provided in the form of pieces of steoro form and distributes pieces of Oreo cake replicas. In this activity students analyze the addition of fractions from Oreos. 2. In the next activity, students stick the pieces of Styrofoam according to the overall piece. The teacher presents a circle board, students take the pieces of the fractional board according to the instructions from the student worksheet and add up the pieces of the fraction. 3. The next activity the teacher presents an image with the shaded pieces, students shade the fractions from the image so that they can add up the fractions with the shaded images. 4. At the formal knowledge level students are given questions to add up the two fractions presented plus one problem by adding up two fractions which results in $1/2$
The teacher provides opportunities for students to answer in different ways	6	1. At the fifth meeting when doing activity 1, namely combining Oreo pieces, the teacher realized that there was still less variety in providing smaller Oreo pieces, so students were not interested in combining smaller Oreo pieces. Therefore, the teacher repeats activity 1 by adding more smaller Oreo pieces. At this meeting students have done many variations in combining Oreos

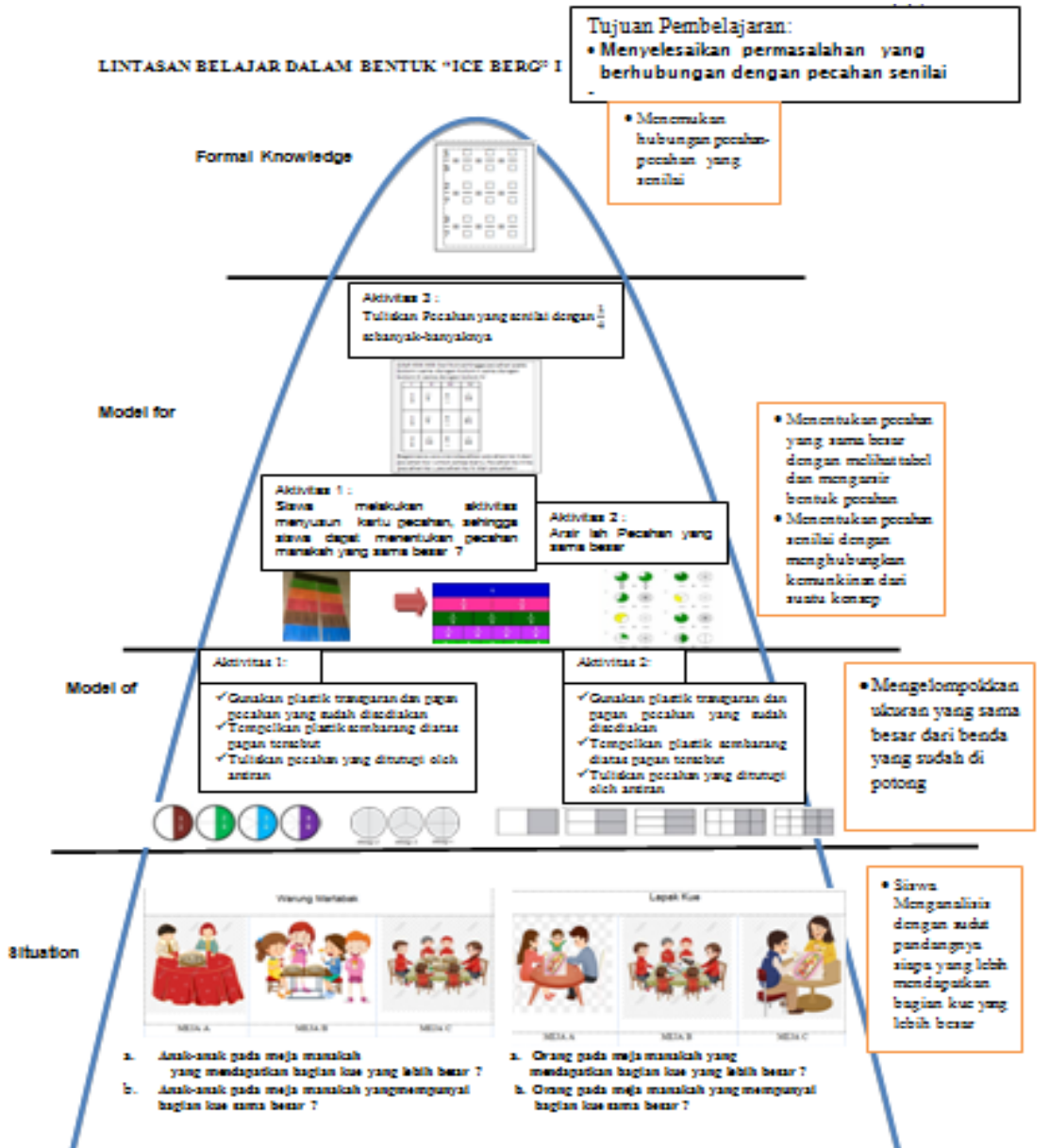


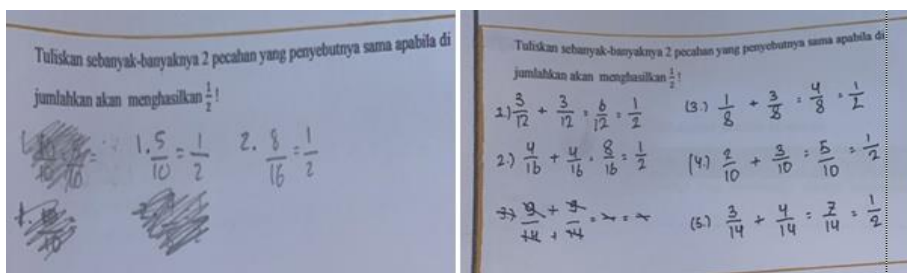
Figure 1. Ice Berg Fractions Worth

In the second question, the problem is presented by comparing fractions. Students choose two fractions freely and compare them. Students in groups 1 and 2 choose fractions that have the same denominator. And can solve it in 5 ways, while students in groups 3 and 4 choose more varied fractions and can solve it in 6 ways. The following is an excerpt of the conversation between the teacher and students via video documentation.

Teacher: Please pay attention to the last activity questions, in that problem there are several fractions, you can choose as many pairs of fractions and then try to compare it!

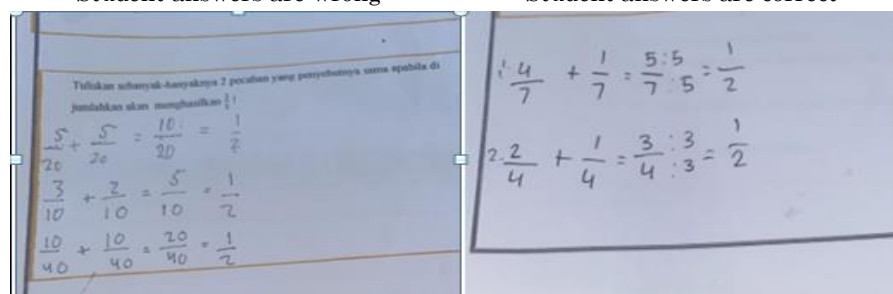
Student: Try to calculate how much ma'am?.

Teacher: Is it possible a lot.



Student answers are wrong

Student answers are correct



Student answers are correct

Student answers are wrong

Figure 4. Results of student answers

In the third question, the problem is presented by adding up fractions that have a value of 1/2. Students in group 1 finished with multiples of 5. Students in group 2 were wrong in answering the question. Students in group 3 can only name 2 ways and students in group 4 can solve it in 6 ways correctly and varied. The following is an excerpt of the conversation between the teacher and students via video documentation.

Teacher: Please pay attention to the last question. The command is to write down as many fractions that produce 1/2. Remember yesterday's material about fractions of worth?.

Student: Yes ma'am.

Teacher: So, you can make any fraction, the results will be divided so that it will produce a 1/2 value. For example, Mother gives an example of 1/8 + 3/8 what is the results?.

Student: Four per eight

Teacher: Yes, right. Then so that he produces 1/2 then four divided into 4 and 8 divided by 4, must be the same as divided into 4 so that it finally produces 1/2.

Student: The numbers are up to ma'am?.

Teacher: Yes.

Based on the results of students' answers, it appears that students have answered creative thinking questions in various ways. Even so, there are students who are still wrong in solving the problem. Creative thinking is needed by students in solving problems in mathematics. This is expected because to maximize performance the function of the right and left brain work well, because the right brain function to think creates and the left brain function to analyze and criticize the problem

Table 3. Creative Thinking Ideas

Indicators	Descriptions
Fluency	Generate lots of ideas, lots of answers, lots of problem solving, lots of questions smoothly provide many ways or suggestions for doing things always think of more than one answer
Flexibility	Produce varied ideas, answers or questions, be able to see a problem from different points of view looking for many different alternatives or directions being able to change the way of approach or way of thinking

Based on the creativity test questions for SD Negeri 5 Banda Sakti students, the answer scores based on the rubric for assessing students' thinking abilities are as follows:

Table 4. Creative Thinking score

No	Thinking Ability	Score
1	Fluency	1
2	Flexibility	1,5
Total		3,5

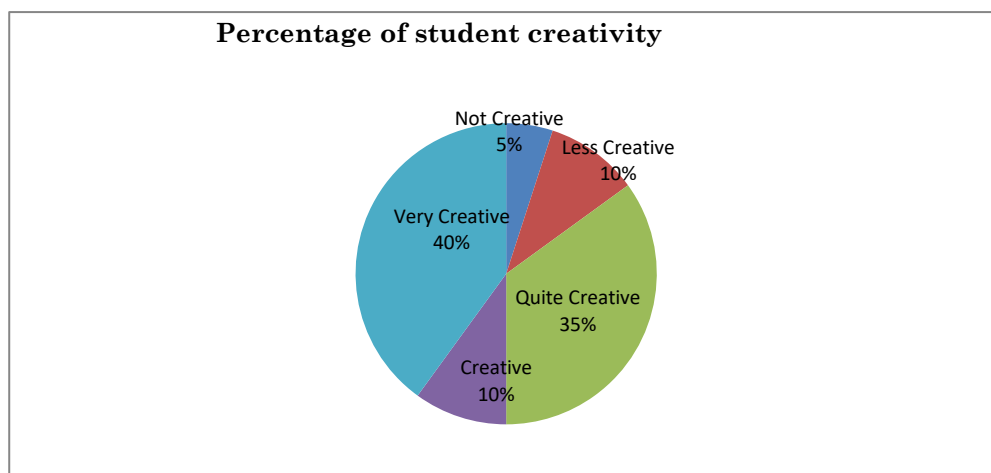


Figure 5. Student creativity diagram

Based on the results of the students' creative thinking test that 40% of students are in the very creative category, 10% are in the creative category, 35 are in the moderately creative category, 10% are in the less creative category and 5% are in the non-creative category.

4. CONCLUSION

Based on the results of the students' creative thinking test that 40% of students are in the very creative category, 10% are in the creative category, 35 are in the moderately creative category, 10% are in the less creative category and 5% are in the non-creative category.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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