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The Effectiveness of the Realistic Mathematics Education Approach to Improve Students' Creativity in Learning Mathematics

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ABSTRACT

This thesis aims to know the effectiveness of the Realistic Mathematics Education (RME) approach to improve students' creativity in learning mathematics by using some indicators on the students' exhaustiveness score, the student's activity in the learning process, and the students' response toward the learning process of mathematics. This research was conducted in the Junior High School of UNISMUH of Makassar. This research used pre-experimental with pretest-posttest and was done within 3 weeks. The procedure of this research was included in preparation, implementation and report. The data collection technique was testing, students' activity observation, students' response questionnaire and documentation. The data analysis used descriptive statistical analysis and inferential statistical analysis. The sampling of this research was the students of VIII.A1 grade of Junior High School of UNISMUH Makassar which consisted of 25 students. The results obtained from the indicators of students' exhaustiveness show that the classical test individually 100% that there is no student has a higher score than KKM. While in the posttest, there are 19 students, or 76%, who pass the minimum score criteria (KKM), and there are six students or 24% who do not pass the KKM. The students' response toward the approach increased by 75% and the student's activity in the learning process by implementing Education Mathematics Realistic (RME) approach is good.

Keywords: *Realistic Mathematics Education (RME), Student' Creativity, Learning Mathematics.*

1. INTRODUCTION

The changing of time that requires individuals to master 21st-century skills have an impact on education. The effect is a change in learning activities. Learning in the 21st century must ensure students have 21st-century skills, including the skills, work habits, and character traits that are believed to be essential to a successful life. Learning activities should ensure that students have (1) learning and innovation skills, including critical thinking and problem-solving skills, communication and collaboration, creativity and innovation; (2) information, media, and technology skills; and (3) life and career skills [1]. To achieve these skills, students need educational programs that can develop human resources to become competitive individuals.

Learning in schools must be able to develop student skills, one of which is creativity development. Creativity development aims to prepare students to face the challenges of the industry [2]. In fact, the development of student creativity in schools is still not optimal. The lack of attention to the development of creativity is caused by the assumption that creativity cannot be learned and measured. Stated that creativity can be learned in a learning environment that supports questions, patience, openness to new ideas, high confidence, and learning from mistakes and failures [1]. Creativity can be developed with continuous practice.

The development of communication and information technology, social media, limited natural resources, and unexpected changes demand creative thinking skills and abilities. "Virtually any business or industrial position that involves responsibility and action in the face of uncertainty will benefit if the person filling the position acquires a high level of ability to think critically and creatively" [3]. The results of a survey on skills needed in the workplace reveal that creative and critical thinking skills are two of the four major skills needed for doing business. Mathematics plays an important role in educating students and shaping student characteristics, including thinking creatively. These skills do not come naturally but are acquired and nurtured from basic to higher

education levels. These skills and abilities need to be developed in every subject, including Mathematics. These skills need to be taught and practiced during teaching and learning sessions. Therefore, teachers are expected to design a supportive learning atmosphere to foster students' creative thinking skills [4-6].

RME (Realistics Mathematics Education) is a teaching approach in mathematics developed in the Netherlands; this approach presents a realistic learning process. RME (Realistic Mathematics Education) is learning that utilizes contextual problems and concrete objects to understand the concept of the problem that occurs. Two important things must be related to reality and mathematics as a human activity. First, mathematics must be relevant to everyday life situations. However, the word "realistic" not only denotes the real world but also denotes a real, imaginable problem for students. Second, mathematics as a human activity is important because RME is a mathematic learning approach that keeps students' reality and environment as a starting point for teaching [7].

RME (Realistics Mathematics Education) approach can improve students' creative thinking skills [8]. The implementation of Realistic Mathematics Education using Geometer's Sketchpad on the topic of proportion to improve students' critical and creative thinking skills [9]. The application of the RME approach can develop creative thinking skills [10]. Therefore, this study is conducted to determine whether the use of RME (Realistic Mathematics Education) effectively improves the creative thinking of junior high school students. Effectiveness in teaching is very diverse; one is effective learning based on the program's objectives, according to the students being taught and the context of the learning environment.

2. LITERATURE REVIEW

2.1. Learning Effectiveness

Effectiveness means the success of an effort or action [11]. The term effectiveness commonly used in education management is, for example, program effectiveness, learning effectiveness, and manager effectiveness. The word effective itself means effective [11]. Effectiveness is a measure that states the extent to which the objectives (quality, quantity, and time) have been achieved [12]. Meanwhile, Ekosusilo suggests that effectiveness is a condition that shows the extent to which what has been planned can be achieved. The more plans that can be completed, the more influential the activity will be [13]. So we can conclude that effectiveness is a matter, measure, or condition related to the extent to which the success of an effort or action.

The teaching and learning process refers to a series of reciprocal interactions between teachers and students in educational situations. The process here can be interpreted as the interaction of all components or elements in teaching and learning interconnected with each other (interdependent) in a bond to achieve goals [14]. Learning is defined as the process of changing behavior in individuals due to the interaction between individuals and individuals with their environment. This change can be marked by changes in behavior, both aspects of knowledge, skills, and aspects of attitudes [14]. Meanwhile, Burton suggests that teaching is the guidance of learning activities. From this, we can see that teaching is the guidance of a learning activity [14]. Teaching in principle guides students in teaching and learning activities or implies that teaching is an effort to organize the environment concerning students and teaching materials that lead to the learning process [14].

Therefore, it can be concluded that the learning or teaching and learning process is a process that contains a series of actions of teachers and students based on reciprocal relationships that take place in educational situations to achieve certain goals. 6) suggests that teaching in principle guides students in teaching and learning activities or implies that teaching is an effort to organize the environment about students and teaching materials that lead to the learning process. Therefore, it can be concluded that the learning or teaching and learning process is a process that contains a series of actions of teachers and students based on reciprocal relationships that take place in educational situations to achieve certain goals. 6) suggests that teaching in principle guides students in teaching and learning activities or implies that teaching is an effort to organize the environment to students and teaching materials that lead to the learning process. Therefore, it can be concluded that the learning or teaching and learning process is a process that contains a series of actions of teachers and students based on reciprocal relationships that take place in educational situations to achieve specific goals.

The effectiveness of learning can be seen from 4 indicators, namely student learning outcomes, student activities, teacher activities, and student responses after the implementation of learning.

Thus overall, it can be concluded that the effectiveness of learning is the measurement of the success of a process of interaction between teachers and students in educational situations to achieve

specific goals, in this case, the purposes of the learning itself.

2.2. Mathematics Learning Approach

Approach to learning as a path, method, or policy taken by teachers or students to achieve learning objectives in terms of how the learning process or materials are managed [15]. Technically, the learning approach can be interpreted as a way of thinking of the teacher as a learner to create an atmosphere that allows students to experience the expected behavior resulting from the learning process. Furthermore, the learning approach is defined as a concept that includes basic assumptions about students, the learning process, and the atmosphere that creates learning events [16]. The mathematics learning approach is into two, namely [17]:

- The material approach is the process of explaining certain mathematical topics using other mathematical materials.
- The learning approach is the process of delivering or presenting certain mathematical topics to make it easier for students to understand them.

The approach can be interpreted as our starting point or point of view on the learning process. The term approach refers to the occurrence of a process that is still very general in nature. Based on the study of this opinion, the approach is the first step in forming an idea in viewing a problem or object of study. The approach will determine the direction of implementing the concept to describe the treatment applied to the problem or object of analysis [18]. There are two approaches to learning, namely teacher-centered approaches and student-centered approaches [19]. The teacher-centered approach reduces direct instruction, deductive learning, or expository learning. Meanwhile, the student-centered learning approach reduces inquiry and discovery learning strategies as well as inductive learning.

The learning approach is a concept or procedure used to discuss a lesson to achieve learning objectives whose implementation requires one or more learning methods [20]. The purpose of the approach taken by the teacher is to facilitate students' understanding of the subject matter they provide with different emphasis. Based on the opinion above, the teacher's approach is a procedure to achieve learning objectives. The current learning objective is that students must be active in the learning process, which is to express ideas and discover principles, concepts, or mathematical formulas through learning activities. In addition, students are also required to be creative in the learning process, which is to be active in expressing ideas, discovering principles, concepts, or formulas through a learning activity. In addition, students are also required to be creative in the learning process, especially in participating in the classroom by solving a problem through the case given by the teacher.

2.3. Realistic Mathematical Education (RME)

Realistic Mathematics Education (RME) is one approach in learning mathematics. Realistic Mathematics Education (RME) is developed based on the thought of Hans Freudenthal argues that mathematics is a human activity and must be linked to reality with children and relevant to real-life every day [21]. Mathematics as a human activity means that humans must rediscover mathematical ideas and concepts with adult guidance. This effort is carried out by exploring various "realistic" situations and problems imagined by students. RME theory was first introduced and developed in the Netherlands in 1970 by the Freudenthal Institute [22]. This theory has been adapted and used in many countries globally, such as England, Germany, Denmark, Spain, Portugal, South Africa, Brazil, the United States, Japan, and Malaysia [23].

The word "realistic" is often misunderstood as "real-world" that is, the real world. Many people think that the RME Approach is an approach that must always apply to everyday problems. The use of the word realistic comes from the Dutch language "zichrealiseren" which means "to imagine" or "to imagine." The use of the word "realistic" does not just show a connection with the real world (real-world) but rather refers to the focus of RME in emphasizing the use of an imagined situation by students [24].

The RME approach is one of the student-oriented approaches to learning mathematics. Mathematics as human and mathematics must be connected in real terms to the context of students' daily lives to real learning experiences [25]. Learning activities through the RME approach must be linked to real life and make the student experience a starting point for learning.

RME is a learning and teaching approach that uses reality as a starting point in the teaching and learning process that aims to support students in building and reinventing mathematical concepts through interactive contextual problems [26]. RME activities in classroom learning, starting from contextual problems and give students the freedom to describe, interpret, and solve contextual problems in their own way according to their initial knowledge.

Based on the opinions of these experts, it can be concluded that the RME approach is one of the approaches to learning mathematics that connects

human activities with mathematics to students' learning experiences by being oriented to real things or potential problems for students. In its application, students are seen as individuals with knowledge and experience due to their interaction with the environment. It is expected that with direct student involvement in the discovery of mathematical concepts, learning will be more memorable and can improve the quality of mathematics learning.

2.4. Creative Thinking Ability

Creative thinking is the performance of an individual that produces something new and unexpected [27]. Creative thinking is the ability to generate new ideas or ways of producing a product [28]. Creative thinking is initiating ideas, seeing new or previously unexpected relationships, formulating concepts that are not memorized, creating new answers to old problems, and asking new questions [29]. Creative thinking is an activity to develop new ideas and apply them in problem-solving and the ability to identify associations between two ideas that are not clear [30]. Among the definitions of creative thinking with various expressions, it contains four main components, namely fluency, flexibility, originality, and elaboration.

3. RESEARCH METHOD

This research was quantitative research with a pre-experimental research method. The design form used was One-group pretest-posttest design. The research design in this study is shown in Table 1.

Table 1. Research design

Pretest	Treatment	Posttest
O_1	X	O_2

Note:

O_1 = pretest score before Realistic Approach *Mathematics Education* (RME) Application

X = The treatment is given (independent Variable), namely the implementation of learning by using Realistic Approach *Mathematics Education* (RME)

O_2 = posttest score after applying the Realistic Mathematical Education (RME) Approach

This research was conducted at SMP UNISMUH Makassar in the even semester. Sampling used the purposive sampling method, while the teacher chose the class selection for this research. Based on the teacher's provisions, class VIII. A was selected with 25 students as the class to apply the RME approach. The researcher had conducted treatment at class VIII. A for three meetings. The data of this study were obtained from the results of a written test in the form of details about the questions. This description question was made based on indicators of creative thinking ability, which measured and adjusted to the subject of comparison. Before the questions were given to students, pretest and posttest questions, this instrument was first checked by a validator/expert consultant. This research team had become an expert in mathematics education.

Furthermore, to check the validity and reliability of the questions to be tested, an empirical test was conducted on class VIII A students at the school where the research was conducted with 25 students. Based on the product-moment correlation test calculation, 6 valid items were obtained from the 6 items tested with the results of one high criteria, four moderate criteria, and one low criterion. Questions with a low level of validity were then not used in the pretest and posttest questions. The instrument reliability coefficient (r11) is 0.425, so the reliability of this instrument was classified as moderate. After getting an instrument that was declared valid and reliable, this instrument is declared valid and reliable. It was also distributed to the experimental class at the pre and post-test to see the effectiveness of this RME Approach.

Descriptive analysis was used to calculate the concentration measurement of the learning outcomes data. Calculating the gain (increase) of students' mathematics learning outcomes in the experimental class. The result was obtained by comparing the results of the posttest with the results of the pretest. The aim was to determine the increase in student learning outcomes after being given realistic mathematics learning treatment. The normalized gain (normalized gain) was the result used to calculate the increase in students' mathematics learning outcomes was the normalized gain (normalized gain). The n-gain test formula is proposed by Hake.

$$G = \frac{S_{post} - S_{pre}}{S_{max} - S_{pre}}$$

Information:

S_{post}: Average final test score

S_{pre}: Average initial score

S_{max}: Maximum possible score

Next in Table 3.2 are the criteria for the N-Gain value.

Table 2. N-Gain Value Criteria

N-Gain Value	Criteria
N-gain 0.70	High
0.30 < N-gain < 0.70	Moderate
N-gain 0.30	Low

Based on Table 2, the increase in students' creative thinking skills can be categorized as high if the N-Gain value is greater than 0.7. It is categorized as moderate if the N-Gain score is greater than 0.3 and less than 0.7 and categorized as low if the N-Gain score is less than 0.3.

The data from the observation of student activities during the learning activities were analyzed using the average score. The score for the acquisition of activities for certain categories in one meeting was the time allocation for certain activities divided by the amount of time allocated for all student activities in the observations multiplied by the score for the acquisition of the activity. The quality of learning from the aspect of student activity was measured using the very poor, poor, good, and very good categories. The effectiveness criteria for aspects of student activity The effectiveness criteria for students' activities were determined by calculating the average score of each. The provisions for the category of student activity aspects were based on the following criteria.

Data analysis techniques on the ability of teachers to manage to learn were analyzed using descriptive statistics, namely the average value. The average value was obtained from the average observations for 5 (five) meetings. The average observation result of 5 (five) meetings was obtained from the average observation of the items/indicators of the instrument, namely the score of each indicator (score 1 means very poor, 2 means poor, 3 means enough, 4 means good, and 5 means very good). The criteria used to decide that a teacher's activity was effective if the level had an adequate degree of implementation with the minimum average X value was in a good category.

Data on the students' responses were obtained from questionnaires given to students after learning was done. Student responses about learning were analyzed descriptively in calculating the percentage of the number of students who responded to each category based on the questionnaire to all students in the experimental class.

In this study, data analysis used SPSS to determine the effectiveness of improving learning using the RME approach.

4. FINDINGS AND DISCUSSION

4.1 Descriptive Statistical Analysis Results

4.1.1. Description of Pretest Score

Table 3. Pretest Score Statistics

Statistics	Statistical Value
Sample Size	25
Ideal Score	100
Maximum Score	30,80
Minimum Score	7.70
Score Range	23.10
Average Score	18.63
Standard Deviation	7.59

Based on table 3, it can be stated that the average pretest score in class VIII.A1 SMP Unismuh Makassar is 18.63 from the ideal score of 100 that students may achieve with a standard deviation of 7.59, which means that the average value is greater than the standard deviation. So that, it can be said that the average value is increasingly representative of the data and has a varied distribution of data.

If the pretest is grouped into 4 categories, namely very good, good, moderate, and low based on K13, then the frequency and percentage distributions are obtained as follows:

Table 4. Frequency Distribution and Percentage of Student Pretest Scores

No	The value of learning outcomes	Category	Frequency	Percentage
1	$92 \leq x \leq 100$	Very good	0	0
2	$83 \leq x < 92$	Good	0	0
3	$75 \leq x < 83$	Moderate	0	0
4	$0 \leq x < 75$	Low	25	100
Amount			25	100

Table 4 above shows that 25 students of class VIII.A1 SMP Unismuh Makassar, students who got a score in the less category are 25 students (100%), so there are no students (0%) in the good category, moderate and very good categories. The average pretest score for class VIII.A1 students is 18.63, then converted into 4 categories: very good, good, moderate, and low. The average pretest score for class VIII.A1 students of SMP Unismuh Makassar before

applying the Realistic Mathematics Education (RME) approach is classified as low.

Furthermore, the pretest scores before applying the Realistics Mathematics Education (RME) Approach at class VIII.A1 SMP Unismuh Makassar are categorized based on the minimum completeness criteria (KKM), which can be seen in Table 5 as follows:

Table 5. Description of Pretest Completeness on Students

Score	Category	Frequency	Percentage
$\mathbf{0 \leq x < 75}$	Not Complete	25	100
$75 \leq x \leq 100$	Complete	0	0
Amount		25	100

The criteria for a student classified as complete is if they have a score of at least 75. The number of students who do not meet the requirements for individual completeness is 25 students (100%) of the total 25 students or no students who meet the criteria for individual completeness.

From the analysis above, it can be concluded that the average score of student learning outcomes after learning is complete using the Realistic Mathematics Education (RME) approach. It means it has met the criteria for effectiveness in increasing student creativity. This is in line with research conducted by Ismunandar et al. (2020), showing that using the RME (Realistic Mathematics Education) approach can improve students' creative thinking skills.

4.1.2. Description of Student Learning Outcomes (Posttest)

Table 6. Posttest Score Statistics on Students

Statistics	Statistical Value
Sample Size	25
Ideal Score	100
Maximum Score	100
Minimum Score	45
Score Range	55
Average Score	79.58
Standard Deviation	16.74

Based on table 6 it can be stated that the post-test average score for students in class VIII.A1 SMP Unismuh Makassar is 79.58 out of 100 that students have achieved, this is with a standard deviation of 16.74, which means the standard deviation is lower than the average score, so that, it can be said that the distribution of the data on the average sample is similar.

Table 7. Frequency Distribution and Percentage of Student Posttest Scores

No	The value of learning outcomes	Category	Frequency	Percentage
1	$92 \leq x \leq 100$	Very good	8	32
2	$83 \leq x < 92$	Good	3	12
3	$75 \leq x < 83$	Moderate	8	32
4	$0 \leq x < 75$	Low	6	24
Amount			25	100

Table 7 above shows that there are 25 students of class VIII.A1 SMP Unismuh Makassar, there are 6 students (24%) in the low category, students who get the good category are 8 students (32%), students who get the good category are 3 students (12 %), students who get very good category are 8 students (32 %). After the average posttest in class VIII.A1, where the score is 79.58 then converted into the 4 categories above, then the average posttest score for VIII.A1 students of SMP Unismuh Makassar after the implementation of the Realistics Mathematics Education (RME) approach is considered very good.

Table 8. Description of Posttest Completeness on Students

Score	Category	Frequency	Percentage
$\mathbf{0 \leq x < 75}$	Not Complete	6	24
$75 \leq x \leq 100$	Complete	19	76
Amount		25	100

Furthermore, the posttest scores after applying the Realistics Mathematics Education (RME) approach to class VIII.A1 SMP Unismuh Makassar are categorized based on the minimum completeness criteria (KKM) that there are 25 students as research subjects that there are 19 students (76%) incomplete category and 6 students (24%) are not categorized as complete individually. This means that students in class VIII.A1 achieve classical completeness because classical mastery is achieved if at least 75% of students in the class achieve the minimum completeness score standardized by the school.

4.1.3. Description of Student Learning Activities (Posttest)

The results of observing student activities with the Realistic Mathematics Education (RME) approach for 3 meetings are stated in the percentage that the indicators of the success of student activities in this study are shown by at least 75% of students being

actively involved in the learning process, so from the average percentage of students' activities are 89.14%

4.1.4. Description of Student Response Questionnaire

The results of the analysis of student response data are expressed in percentages which in general, the average student of class VIII.A1 SMP Unismuh Makassar gives a positive response to the implementation of learning through the application of the Realistic Mathematics Education (RME) approach, where the average percentage of student responses is 87.1%. Thus the student response can be effective because it has met the criteria for student responses, namely 75% give a positive response.

4.2 Inferential Statistical Analysis Results

4.2.1. Normality test

By using the assistance of a computer program with the Statistical Product and Service Solutions (SPSS) program with the Kolmogorov-Smirnov Test as follows:

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pretest	.164	25	.082	.927	25	.075
posttest	.152	25	.139	.903	25	.021
Gain	.154	25	.128	.903	25	.022

a. Lilliefors Significance Correction

Figure 1. Normality test.

The results of the analysis of the average score for the pretest show a value of 0.082 > 0.05, and the average score for the post-test shows a value of 0.139 > 0.05. This indicates that there is a difference between the pretest score and the posttest score with a normal distribution $P_{-value} > \alpha$ $P_{value} > \alpha$

4.2.2. Gain Test

The normalized gain test aims to determine the completeness of student learning outcomes. The results of the Normalized test in Figure 1 show that the gain index = 0.75. This means that it is in the interval g 0.7, so it can be concluded that the increase in learning outcomes is categorized as high. The classification of improving student learning outcomes is presented in the following table:

Table 9. Classification of Normalized Gain in Class VIII.A1 SMP Unismuh

Gain normalization coefficient	The number of students	%	Classification
N-gain 0.70	**18**	**2**	**High**
0.30 < N-gain < 0.70	**6**	**4**	**Moderate**
N-gain 0.30	**1**		**Low**
Average	**0.75**		**High**

Based on Table 9, it appears that the increase in students' abilities after being taught by applying the Realistics Mathematics Education (RME) approach is in the high category.

4.2.3. Hypothesis test

4.2.3.1. Average Student Learning Outcomes

The average student learning outcomes after being taught using the Realistic Mathematical Education (RME) approach is calculated using a one-sample test which is formulated with the following hypothesis;

Ho : 74.9 against H1 : > 74.9 $\mu \leq \mu$

Information:
π: The average score of student learning outcomes

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
posttest	25	79.5880	16.74981	3.34996
Gain	25	.7585	.19494	.03899

One-Sample Test

Test Value = 0

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
posttest	23.758	24	.000	79.58800	72.6740	86.5020
Gain	19.454	24	.000	.75849	.6780	.8390

Figure 2. t-test

Based on the results of the SPSS analysis as shown in Figure 2, it appears that the p Nilai value *(sig. (2-tailed)* is 0.00 < 0.05 indicating that the average student learning outcome is more than 75. This means that H0 is rejected and H1 is accepted. That is, the average student's post-test learning outcome is more than or equal to the KKM.

4.2.3.2. Student Learning Mastery

Completeness of student learning after being taught using the approach *Realistic Mathematics Education* (RME) is classically calculated using the proportion test, which is formulated with the following hypothesis:

H0: 1: $\pi \leq 74{,}9$ % melawan $H\pi > 74{,}9$ %

Information:

: Parameters of classical learning completeness

Classical completeness testing of students is done by using the proportion test. For the proportion test using a significant level of 5%, Z table = 0.04 means that H0 is accepted if Z-*count is* 0.12. Because the value of Z. is obtained *count* = 0.12, then H0 is rejected, meaning that the proportion of students who reach the completeness criteria of 75 (KKM) > 74.9% of all students who take the test. Based on the description above, it can be seen that the proportion of students who reach the completeness criteria of 75 (KKM) is more than 74.9%. So it can be concluded that inferentially students' learning outcomes in mathematics after being taught using *Realistic Mathematics Education* (RME) meet the criteria of effectiveness in increasing students' creativity.

4.2.3.3. Student's Average Normalized Gain

The average normalized gain of students after being taught using *Realistic Mathematics Education* (RME) is calculated using the – *t one sample test* the hypothesis is formulated as follows:

H0 : g 0.29 Against H1 : g > 0.29 μ

Information

g: average score of normalized gain

Based on the results of the analysis in Figure 2, it appears that the p. value *(sing.(2-tailed))* is 0.000 < 0.05 indicating that the average normalized gain in class students is more than 0.29. This means that H0 is rejected and H1 is accepted. Namely, the normalized gain of student learning outcomes is in the medium category.

From the analysis above, it can be concluded that the average score of student learning outcomes after learning using the approach *Realistic Mathematics Education* (RME) has met the criteria of effectiveness in increasing students' creativity. This is in line with research conducted by Ismunandar et al. (2020), which shows that using the RME (Realistic Mathematics Education) approach can improve students' creative thinking skills.

5. CONCLUSION

Initial conditioning in learning using the RME approach and the presentation of conclusions still needs to be improved. However, with these shortcomings, students can still achieve the minimum standard of creative thinking skills targeted by researchers. The researcher concludes that learning with the RME approach is quite effective in improving students' creative thinking.

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