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The Effect Of Mathematics Learning Approaches Realistic About Thinking Abilities Student Critical Response

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Abstract

This study aims to determine the influence of the realistic mathematics learning approach on students' critical thinking skills at Taman Madya (Sma) Tamansiswa Pematangsiantar. This study uses a quantitative approach with an experimental research type. Experimental research is a way to find a causal relationship between two factors that are intentionally created by the researcher by eliminating or reducing or setting aside the factors of the approach. This research design is a form of illustration to facilitate the steps of problem solving or hypothesis testing. Judging from the objectives and hypotheses proposed, the form of research design used in this study is Quasi Experiment Post-test Only Based on the results of data analysis and discussion, it can be concluded that there is a positive and significant influence of the Realistic Mathematics Learning Approach on critical thinking skills in Taman Madya (SMA) Tamansiswa Pematangsiantar. This influence can be seen from the regression equation = Y^^=-1.434+0.765X with a regression coefficient of 0.765 and a large determination coefficient of 94.8% which indicates that there is a positive relationship between the TTW type Cooperative learning model and problem-solving abilities.

Keywords: Influence , Learning Approach , Mathematics Realistic , Thinking Ability Critical

INTRODUCTION

Mathematics is a compulsory subject at every level of education in Indonesia, from elementary school to high school, and even up to university. According to Sumarmo (2017), mathematics is a science used to improve critical, logical, analytical, creative, and systematic thinking skills. Furthermore, mathematics is crucial for developing rational and objective thought patterns. Mathematics is a discipline that fosters reasoning, critical, logical, and thorough thinking, as well as an objective and open attitude in addressing various problems (Saputra, 2020). Therefore, mathematics is an essential component that must be taught at all levels of education, from elementary school to university. This demonstrates that mathematics serves not only as a basic science but also as a foundation for the development of various other branches of knowledge. As a product of social and cultural development, mathematics serves as a thinking tool for solving problems through a structure consisting

of axioms, theorems, proofs, problems, and solutions (Purba, Pangaribuan, & Hutauruk, 2022).

Thus, the presence of mathematics in the educational curriculum is not merely for administrative purposes, but rather as a strategic tool for developing students' cognitive abilities and thinking skills (Anggelina, Rosyidah, Setyawati, Nahdlatul, & Lampung, 2023). In the context of secondary education, mathematics learning contributes significantly to shaping students' character, enabling them to think logically, analytically, and systematically. One of the primary goals of mathematics learning is to develop skills that are not limited to cognitive aspects but can also be applied in everyday life (Herwanto, Mujib, & Karnasih, 2020). One ability that is a crucial indicator of this achievement is problem-solving ability, which reflects a deep understanding of mathematical concepts (Narayani, 2019).

According to the Minister of Education and Culture Regulation No. 21 of 2016, in the mathematics learning content standards, it is stated that students must master the following abilities: (1) logical, analytical, systematic, critical, and creative thinking, (2) using mathematics in everyday life, (3) solving contextual problems using mathematical strategies. Overall, these three abilities are interrelated and form the basis of basic mathematical abilities that are expected to be mastered by each student. Mathematics learning that integrates logical, applied, and contextual problem-solving thinking skills not only makes learning more meaningful, but also contributes significantly to improving the quality of Indonesia's human resources. One important aspect that is also developed through this learning is critical thinking skills. By facing various problems that require analysis, reasoning, and evaluation, students are trained not only to receive information passively, but also to be able to question, evaluate, and formulate arguments rationally. Thus, mathematics learning plays a strategic role in developing critical thinking skills that are greatly needed in the current era of globalization and the industrial revolution.

According to Facione (Riawati, 2016) critical thinking is a thinking process that is carried out actively and skillfully in analyzing, synthesizing, evaluating information, and making conclusions based on evidence. Facione put forward four indicators of critical thinking skills which include: (1) Analysis, (2) Evaluation, (3) Inference, (4) Explanation. Meanwhile, Santrock (Prastika, 2020) critical thinking skills are the ability to think reflectively and productively and evaluate evidence. In the context of education, critical thinking helps students develop logical ways of thinking and not just passively receiving information.

From my internship experience in the 10th grade at Taman Siswa Senior High School in Pematangsiantar, I concluded that students' critical thinking skills in mathematics, particularly in algebra, are still relatively low. This is evident in the tendency of students to focus solely on procedural problem-solving, without truly understanding the underlying concepts. Many students immediately use formulas without being able to explain why they are used or how they relate to the context of the problem. Furthermore, when given problems that differ slightly from the examples in the textbook, they appear confused and lack confidence in determining their solution strategies (Narwati, 2020).

To clarify the above problem, the researcher conducted an observation by giving two math problems to 30 students in grade X to determine the students' abilities according to the existing problem-solving ability indicators (Yanti, 2018). After completing the test in Algebra material at SMA Taman Madya Taman Siswa Pematangsiantar, the researcher found a problem where almost all students did not have the ability to solve or solve a problem.

If X = -2 and y = 3 find the value of the following algebraic form:

a. (x+7y) + (4x-3y)

b. $4x^2$. xy : (-2x)

The following are the results of one of the students' answers given with Algebra material at Taman Madya Taman Siswa High School.

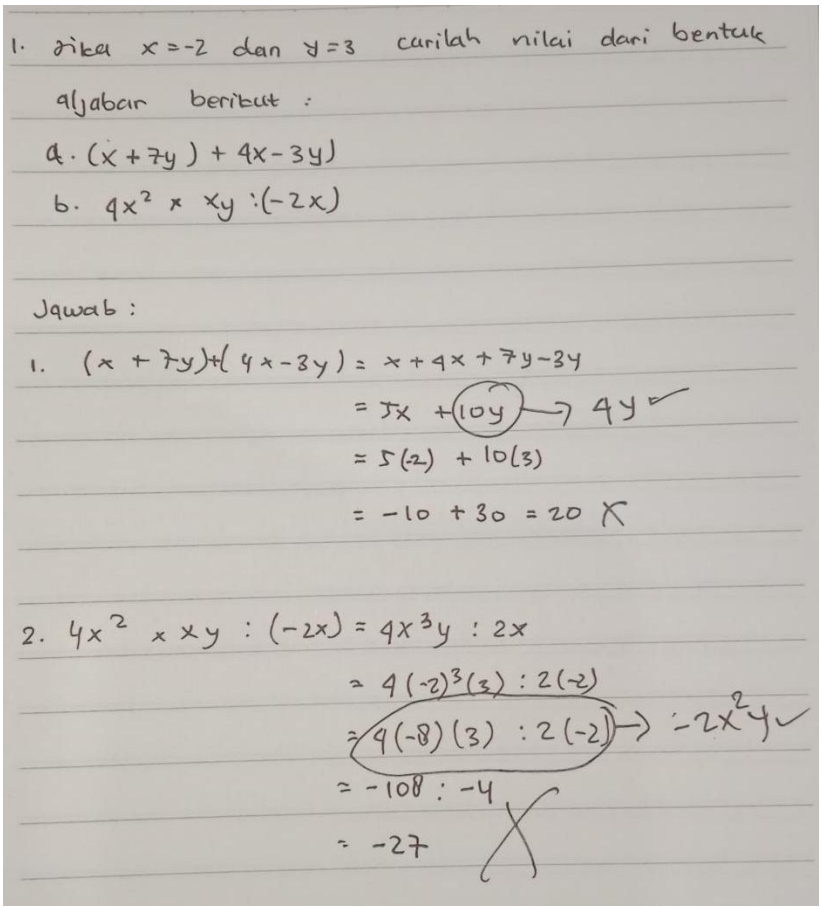

Figure 1. Results of observations of class X students

Based on the results of observations of 30 students in solving algebra problems designed to measure critical thinking skills, the following results were obtained (Basiran, Supriadi, & Suroyo, 2021):

1. Three students (10%) were able to complete the problem comprehensively according to Facione's six stages of critical thinking. It can be concluded that these three students possess good critical thinking competencies in solving math problems,

especially in algebraic forms. This shows that critical thinking skills are not just about solving problems, but involve a structured, in-depth and reflective thinking process.

2. Meanwhile, 8 students (26.7%) were only able to partially complete the questions, indicating that they had only achieved partial critical thinking skills, such as being able to interpret and analyze the questions, but had difficulty evaluating, inferring, and explaining and reflecting on their answers. This indicates that their critical thinking process has not yet fully developed.
3. The other 19 students (63.3%) were unable to solve the problem at all. They appeared to experience difficulties even from the initial stages, such as understanding the problem information (interpretation) or determining a solution strategy (analysis). This indicates weak critical thinking skills, particularly in understanding problems and developing logical strategies for solving algebraic math problems.

Students' low critical thinking skills in mathematics are quite complex and are caused by various interrelated factors. Critical thinking is an important skill in mathematics learning because it involves higher-order thinking processes, such as analyzing problems, evaluating strategies, drawing logical conclusions, and reflecting on results. According to Fitriani et al. (Harahap & Lubis, 2019) in their research on mathematics learning, they stated that thinking is a student's ability to interpret problems, analyze problems, evaluate procedures, draw conclusions, explain reasons, and reflect on the results of problem solving logically and systematically. This shows that critical thinking is not just about solving problems, but more about how students understand the meaning of the problem in depth, identify appropriate strategies, evaluate the process carried out, and reflect on the final results. In the context of mathematics learning, this ability is very important because mathematics is not only about getting the right answer, but also how to arrive at that answer rationally and structured. This is in line with research by Snyder & Snyder (Ningsih, 2010) which states that critical thinking is an intellectual process, which involves collecting, analyzing, synthesizing, and evaluating information to guide beliefs and actions, critical thinking includes skills to question assumptions, identify biases, evaluate evidence, and consider multiple perspectives before making decisions. They emphasize that in the context of the 21st century, students must be equipped with critical thinking skills to be able to adapt to complex and dynamic challenges. Thus, the development of students' critical thinking skills in mathematics needs to be a primary concern in the learning process so that students are not only able to answer questions, but also understand and explain the solution process rationally and responsibly (Liando, 2022).

From the results of an interview with the mathematics teacher of class X SMA Taman Madya Tamansiswa Pematangsiantar, Mrs. Rukayah Noprilan Siagian, M.Pd., it was obtained information that most students were less active in the learning process, especially in discussion activities and expressing opinions. She said that the ongoing learning was still dominated by lecture methods or teacher-centered approaches, so that students became passive and had difficulty in solving questions that required high-level thinking skills. This condition reflects the weak mastery of students on indicators of critical thinking skills, starting from understanding information, to evaluating work results systematically. to overcome (Yusmanita, Ikhsan, & Zubainur, 2018).

To address these issues, a mathematics learning approach is needed that can support active student involvement. One approach that is considered relevant is the realistic mathematics approach, which emphasizes that mathematics must be linked to the real world and relevant to students' lives, so that students can construct their own mathematical understanding through an active modeling and discovery process. According to Hia and Yasifati (Marande & Diana, 2022) the realistic mathematics approach is a social constructivism-based mathematics learning, which instills logical, systematic, objective, critical, and rational thinking patterns in students. This approach is student-centered and encourages discussion and collaboration as the primary means of actively discovering mathematical concepts.

In general, a learning approach is a comprehensive perspective or perspective on the teaching and learning process, which serves as the basis for designing learning strategies, methods, and techniques. This approach reflects basic beliefs or assumptions about how students learn, what the teacher's role should be, and how learning objectives can be achieved effectively. Therefore, one appropriate solution to address students' low critical thinking skills in mathematics is to apply a realistic mathematics approach. This approach prioritizes students' active involvement in solving real-life problems so they can develop critical thinking skills through active modeling, discussion, and reflection. The Realistic Mathematics Learning Approach was developed by a group of mathematicians and educators in the Netherlands, pioneered by Hans Freudenthal in the late 1970s to early 1980s. Freudenthal emphasized that mathematics should be studied as a real, contextual human activity, not simply as a collection of abstract concepts (Sari & Munir, 2023).

In general, a realistic mathematics learning approach in critical thinking directs students to: (1) Connect mathematical problems with real-life situations. real-life situations that are relevant to everyday life so that learning becomes more meaningful and contextual. (2) Develop critical thinking skills by analyzing, evaluating, and solving problems systematically through a mathematical modeling process. (3) Actively participate in the learning process, including discussing, asking questions, and collaborating with friends to find various alternative solutions. (4 **)** Explore and reflect on ideas in depth so that they can build mathematical understanding independently and logically. (5) Communicate the results of thoughts and solutions clearly and in a structured manner, both verbally and in writing, to strengthen the ability to argue and be responsible for the results of one's thoughts (Rajagukguk & Hazrati, 2021).

The advantage of a realistic mathematics learning approach is that it can make learning more meaningful by linking the material studied to real-life situations relevant to students' lives. This approach encourages students to think critically and actively in solving problems through modeling, discussion, and reflection. Furthermore, this approach helps students develop communication skills, both verbally and in writing, and builds a deeper understanding through constructive learning experiences. Students are also encouraged to collaborate, exchange ideas, and take responsibility for the learning process, thus not only understanding the material but also developing social attitudes and learning independence.

In the learning process, student perception is crucial for supporting learning success. According to Drever (Panjaitan & Sukmawarti, 2022) student perception is an experience

gained through sensory observation, which is then selected, organized, and interpreted into meaningful information. In a realistic mathematics learning approach, student perception is related to how they see and understand the material through real-world problems related to everyday life. Through this approach, students not only receive lessons directly but also actively learn by constructing their own understanding through activities such as modeling, discussing, and reflecting on their learning outcomes. If students have a good perception of the material, they will more easily understand the lesson and achieve learning objectives more optimally. This student perception will be used to assess the value of the realistic mathematics learning approach (RMT) (Fatimah, Asmara, Mauliya, & Puspaningtyas, 2021).

Previous research conducted at the junior high school level by Ulaimi et al. (2021), the experimental class using PMR and t-test showed: p-value <0.05 → normally distributed data and significant t-test, indicating that the mathematical critical thinking skills of students taught with PMR are better than those taught conventionally. Meanwhile, at the high school level, research by Manik (2023) using the PMR approach obtained t-test results: calculated t value = 3.156 > t table = 1.998 → H_0 is rejected, meaning a significant difference. The highest scores on the interpretation indicator (86.02%), analysis (71.07%), evaluation (75%), the researcher concluded that PMR significantly improves the mathematical critical thinking skills of students at SMA Negeri 17 Medan compared to the conventional approach. From the two previous studies, the researcher concluded overall, these findings strengthen the evidence that PMR is effective at various levels, because it is able to significantly develop students' mathematical critical thinking skills compared to the conventional approach.

Based on this description, this study aims to quantitatively determine the effect of a realistic mathematics learning approach on students' critical thinking skills, so that its application can be more appropriately tailored to the characteristics of students at that level. To address and resolve this issue, a study entitled "The Effect of a Realistic Mathematics Learning Approach" was conducted. (RME) on the Critical Thinking Skills of Students at Taman Siswa High School (SMA) Pematangsiantar"

METHOD

This research uses a quantitative approach with an experimental research type. Experimental research is a way to find a causal relationship (causal relationship) between two factors that are intentionally caused by researchers by eliminating or reducing or setting aside the approach factors (Nurvicalesti, Dewi, & Walid, 2019). Meanwhile, according to Sugiyono (2012) said that experimental research is a research method used to find the effect of certain treatments on others in controlled conditions. This research provides a stimulus treatment and certain conditions. This research involved two groups, where the experimental group was given treatment using the Realistic Mathematics Learning (RMAT) approach, while the control group was not given treatment and continued to use conventional methods. Researchers applied a posttest in this study. The posttest is a measure of several characteristics assessed for participants in an experiment after treatment.

This research design serves as a visualization to facilitate problem-solving or hypothesis testing. Based on the proposed objectives and hypotheses, the research design used in this study is a Quasi-Experimental Post-test Only. After the learning process, students are given a final test (posttest) to measure their ability to solve mathematical

problems. The results of this evaluation are then analyzed to assess the effectiveness of the RMR approach in improving students' critical thinking skills (Puspaningrum, Syahputra, & Surya, 2021).

In this design, there are two groups, each selected randomly (R). The first group is given treatment X and the other group is not. The research was conducted at Taman Madya (SMA) Taman Siswa Pematangsiantar, located at Jalan RAKartini No. 18, Pematangsiantar. The research will be conducted in the odd semester of the 2025/2026 academic year. The reason for conducting this research at Taman Madya (SMA) Taman Siswa Pematangsiantar is because no one has ever conducted the same research with this title before. This research will last for approximately 1 month.

The population is the entirety of the research subjects. According to Sugiyono (2017), a population is a generalized area consisting of objects or subjects with certain characteristics determined by the researcher to be studied and then conclusions drawn. The population of this study was all 10th grade students of Taman Madya (SMA) Taman Siswa Pematangsiantar in the 2025/2026 academic year, consisting of 4 classes.

This study uses a large population, so it is necessary for researchers to determine the research sample. A sample is a portion or representative of the population being studied (Afsari, Safitri, Harahap, & Munthe, 2021). According to Sugiyono (2014), a sample is part of the number and characteristics of a population. From the opinions of experts Suharsini (2013) and Sugiyono (2014), it can be concluded that a sample is part of a population to be studied. In determining the sample, the term sampling is known. The sampling technique used in this study is purposive sampling. Purposive sampling is part of the non-probability sampling technique, namely a sampling technique that does not provide equal opportunities or chances for each element or member of the population to be selected as a sample (Widiastuti & Nindiasari, 2022). Purposive sampling is a technique for determining subjects to be samples because it is based on consideration, observation and interviews with teachers. In this study, the sample was class XC students.

A research variable is anything that a researcher determines to be studied to obtain information about it and then draw conclusions. Theoretically, research can be defined as an attribute of a person or object that varies from one person to another or from one object to another (Lathiifah, Apriani, & Agustine, 2019). Regarding the role and function of variables in research, researchers use two variables or factors in their research, namely:

a. Independent variable

An independent variable is a variable that influences or causes changes in or the emergence of a dependent variable. The independent variable in this study is the learning approach, namely the Realistic Mathematics Learning (RMAT) approach.

b. Dependent variable

The dependent variable is a variable that is influenced or that is the result of the independent variable (Marni & Pasaribu, 2021). The dependent variable in this study is students' critical mathematical thinking skills.

In this study, data collection techniques were carried out using several methods to obtain relevant data and support the research objectives . Data analysis is the process of processing collected data in order to provide meaning to the research results. According to

Sugiyono (Simamora, Simamora, & Dewi, 2022) data analysis is the process of systematically searching and compiling data obtained from interviews, field notes, and documentation, by organizing data into categories, describing them into units, synthesizing, compiling patterns, selecting what is important and will be studied, and drawing conclusions so that they are easily understood by oneself and others. The collected data were processed and analyzed to be able to show the influence of the PMR approach on students' critical thinking skills.

RESULTS AND DISCUSSION

The research was conducted at Taman Madya (SMA) Tamansiswa Pematangsiantar, Pematangsiantar City, North Sumatra Province. This research was conducted on September 30, 2025 to October 10, 2025 in the 2025/2026 academic year. The purpose of this study was to see the effect of the PMR approach on students' critical thinking skills in mathematics on Algebra material by using one sample , namely class XC consisting of 30 students (Renaldi & Saputra, 2021).

When conducting the research, learning was carried out in 4 meetings, where in the first, second, and third meetings treatment was carried out, the fourth meeting was to conduct a problem-solving ability test and provide a perception questionnaire to students.

Table 1. Research Allocation

No.	Activity	Date
1.	Observation	April 6, 2024
2.	Preparation of proposals	August 30, 2025
3.	Proposal seminar	September 2, 2025
4.	Instrument trial	September 27, 2025
5.	Study	30 September 2025-10 October 2025
6.	Processing data	October 10, 2025 – October 15, 2025

Hypothesis Testing

Simple Linear Regression Test Results

Simple regression analysis is used to determine whether the relationship between the independent variable (X) and the dependent variable (Y) has a positive or negative influence. Based on the simple linear regression test conducted using the SPSS 25 program, the results obtained are in Table 4.15.

Table 2. Simple Linear Regression Test Results

Coefficients [a]

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.	95% Confidence Interval for B

		B	Std.Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-1,434	2,242		0.639	0.46	-5,757	7,675
	QUESTIONNAIRE	0.765	0.036	0.974	21,044	0	0.698	0.837

a. Dependent Variable: TEST

EXCEL		Coefficients	Standard Error	t Stat
	Intercept	-1.434103041	2.242797183	0.6394261
	X	0.765953575	0.036396684	21.0445979

Based on calculations using *SPSS 25.0* and Excel as shown in the table, the values $a = -1{,}434$ and $b = 0{,}765$ so that the following regression equation is obtained:

$\hat{Y} = -1{,}434 + 0{,}765X$

Information

$\hat{Y}$: critical thinking skills

X: Student questionnaire scores on the implementation of the PMR approach

From the regression equation above, the following information can be obtained:

a. The value a of -1.434 shows that when students do not provide a perception of the PMR approach (X=0), the Y value is -1.434.
b. The value, b namely the regression coefficient of 0.765, shows that each score on the questionnaire will cause an increase in students' critical mathematical thinking skills of 0.765.
c. positive value indicates that there is a positive influence between the independent variable (X) and the dependent variable (Y).b

From the explanation above, it can be concluded that the realistic mathematics learning approach has a positive influence on critical thinking skills.

t-Test Results

The t-test was conducted to test the research hypothesis regarding the influence of each independent variable on the dependent variable. Based on Table 4.15 with a significance of 0.000 < 0.05 and the calculation results obtained a value t_{hitung} of 21,044. This value is much greater than t_{tabel} 2.048 at a significance level of 5% with degrees of freedom (df = 30 – 2 = 28), so that the calculated t value is > t table. Thus, if $t_{hitung} > t_{tabel}$, then H_0 it is rejected and H_a *diterima* ., which means that there is a positive and significant influence of the realistic mathematics learning approach on students' critical mathematical thinking abilities (Aisyah & Madio, 2021).

Results of the Coefficient of Determination

The coefficient of determination indicates how strongly the independent variable influences the dependent variable. Based on the calculation of the coefficient of determination using SPSS 25, the results are shown in Table

Table 3. Results of the Determination Coefficient

SPSS	Model	R	R. Square	Adjusted R Square	Standard Error of the Estimate
	1	0.974	0.948	0.946	2,835
	a. Predictors; (Constant), Questionnaire				
EXCEL	*Regression Statistics*				
	Multiple R		0.973838214		
	R Square		0.948359755		
	Adjusted R Square		0.946392185		
	Standard Error		2.834967253		
	Observations		30		

Based on the calculations in Table 4.16, the R Square value is 0.948. Thus, the coefficient of determination can be calculated as follows:

$$KP = 0{,}948 \times 100\% = 94{,}8\%$$

This shows that there is a very strong relationship between the Realistic Mathematics Learning Approach and students' critical mathematical thinking abilities.

Discussion

This research was conducted at Taman Madya (SMA) Tamansiswa Pematangsiantar, where this research took class XI-C as the research population and took class XC as a sample of the research and the class where the researcher provided treatment. Before this research was conducted, the researcher first conducted a trial of the instrument to see whether the test instrument and questionnaire had met the research standards or not. In this study, the instrument trial was conducted in class XI-C. After the data was obtained, the test instrument used validity tests, reliability tests, difficulty levels, and discriminatory power, while the questionnaire instrument was tested using validity tests and reliability tests (Muslimahayati, 2019).

Based on the trial data of the critical thinking ability test and the student perception questionnaire in the trial class with a sample size $N$of 30 and a significance level of α = 0.05, the value $r\ tabel$= 0.361 was obtained. From the calculation of the validity of the 5 test questions and 20 questionnaire items, it was found $r\ hitung > r\ tabel$that both the test instrument and the questionnaire instrument were valid and suitable for use in research. Then, from the results of the test item reliability test, the Cronbach's Alpha value was obtained at 0.976 > 0.70, so it can be concluded that the test questions and questionnaire items were obtained that 5 test questions were in the easy category. Finally, based on the results of the discrimination test, it was found that the five test questions had good discrimination power (Anderha & Maskar, 2021).

After determining that the research instrument met research standards, the researcher then conducted the research (Melisa, Widada, & Zamzaili, 2019). The research

implementation process was as follows: First, the researcher administered treatment to the experimental class using the Realistic Mathematics Learning Approach. After the treatment was implemented, the researcher administered the test instrument. critical thinking skills and student perception questionnaires on whether students can follow learning well using the Realistic Mathematics Learning Approach (Yulianty, 2019).

After obtaining data from the research, the researcher then analyzed the research data. Before testing the hypothesis, the prerequisite tests were first carried out, namely the normality test and the linearity test. This normality test was carried out using the *SPSS 25.0 program* . The basis for making decisions in the normality test is that the data is declared normally distributed if the significance value (Sig)> 0.05. Based on the calculation results, the critical thinking ability test value was obtained with a significance of 0.200 and the student perception questionnaire with a significance of 0.200> 0.05, so the research data was normally distributed (Kusumaningrum & Nuriadin, 2022).

After conducting the normality test, the researcher then conducted a linearity test. The linearity test was also conducted using the *SPSS 25.0 program* (Puspitasari & Airlanda, 2021). The basis for making decisions in the linearity test is that the independent variable (X) is said to have a linear relationship with the dependent variable (Y) if the significance value *in the Deviation From Linearity* is > 0.05. Based on the calculation results, it was obtained that the significance value was 0.200 > 0.05, so there is a linear relationship between the independent variable (X) and the dependent variable (Y) (Mbagho & Tupen, 2020).

After conducting the prerequisite test, the researcher then continued the research by conducting a hypothesis test consisting of a simple linear regression analysis, t-test, and coefficient of determination (Jeheman, Gunur, & Jelatu, 2019). Based on the calculation of the simple linear regression analysis, the regression equation was obtained $Y^{\wedge} = -1{,}434 + 0{,}765X$. Because the value of the regression coefficient (b) is positive, this indicates that there is a positive influence on the realistic mathematics learning approach to critical thinking skills. For the t-test, based on the calculation results using the *SPSS 25.0 program, a value* of 21,044 $t\ tabel$was obtained . The value of α $t\ hitung$= 2.048 was obtained from the number of samples N = 30 and α = 0.05. Because α $t\ hitung > t\ tabel$, it is concluded that the independent variable (X) has a significant effect on the dependent variable (Y). Based on the calculation of the coefficient of determination, the value is obtained $r^2 = 0{,}948$, this indicates that the variable X (PMR approach) has a 94.8% effect on the variable Y (critical thinking skills) (Lubis, Ariswoyo, & Syahputra, 2020).

Based on the description above, it can be concluded that there is a positive influence of the Realistic Mathematics Learning approach on critical thinking skills. Therefore, the hypothesis stating that there is a positive and significant influence of the Realistic Mathematics Learning approach on critical thinking skills at Taman Madya (SMA) Tamansiswa Pematangsiantar is accepted as true.

CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that there is a positive and significant influence of the Realistic Mathematics Learning Approach on critical thinking skills in Taman Madya (SMA) Tamansiswa Pematangsiantar. This influence can be seen from the

regression equation = $Y^{\wedge} = -1{,}434 + 0{,}765X$ with a regression coefficient of 0.765 and a large determination coefficient of 94.8% which indicates that there is a positive relationship between the TTW type Cooperative learning model and problem-solving skills.

Suggestion

Based on the results of the research that has been conducted, the researcher would like to provide the following suggestions:

1. For mathematics subject teachers at Taman Madya (SMA) Tamansiswa Pematangsiantar, they can try using the Realistic Mathematics Learning Approach so that the learning models used are more varied and can increase activity and improve the quality of learning.
2. The Realistic Mathematics Learning Approach has a positive influence on critical thinking skills in Algebra material so that other researchers can try using this model for other mathematical materials.
3. By implementing the Realistic Mathematics Learning Approach, it is hoped that students will become more active in learning and can interact better with their classmates so that they can more easily understand the material in mathematics learning.

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