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ROUTINE Vs NON-ROUTINE QUESTIONS IN THE ROTATING TRIO EXCHANGE COOPERATIVE LEARNING MODEL ON STUDENTS' INTEREST IN MATHEMATICS

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Abstract

The types of questions and how the teacher teaches can affect students' interest in learning. Interest in learning has an important direct role, especially in mathematics. Interest in learning will make it easier for students to do the tasks given to them, concentrate, and difficult math lessons become easy for them. So one of the student learning models that can increase student interest in learning is the Rotating Trio Exchange, a cooperative learning model. This study aimed to see the differences in student interest in learning using routine vs non-routine questions in the Rotating Trio Exchange type of cooperative learning model. The type of research used is quasi-experimental, with a total sample of 44 students. The instruments used in this study were test questions, questionnaires and observation sheets. Data analysis used the Wilcoxon test and independent sample t-test. The results of this study conclude that there is a difference in the average learning interest of students who use routine and non-routine questions in the Rotating Trio Exchange type cooperative learning model.

Keywords: *routine vs non-routine questions, Rotating Trio Exchange type cooperative learning model, students' interest*

Abstrak

Jenis pertanyaan dan cara guru mengajar dapat mempengaruhi minat belajar siswa. Minat belajar memiliki peran langsung yang penting, terutama dalam matematika. Minat belajar akan memudahkan siswa dalam mengerjakan tugas-tugas yang diberikan kepadanya, berkonsentrasi, dan pelajaran matematika yang sulit menjadi mudah bagi mereka. Sehingga salah satu model pembelajaran siswa yang dapat meningkatkan minat belajar siswa adalah Rotating Trio Exchange cooperative learning model. Tujuan penelitian ini adalah melihat perbedaan minat belajar siswa yang menggunakan soal rutin vs non rutin pada model pembelajaran kooperatif tipe Rotating Trio Exchange. Jenis penelitian yang digunakan adalah penelitian Eksperimen Semu dengan jumlah sampel 44 siswa. Instrumen digunakan penelitian ini adalah soal tes, angket dan lembar observasi. Analisis data menggunakan uji wilcoxon dan uji independent sampel t-test. Hasil penelitian ini menyimpulkan bahwa terdapat perbedaan rata-rata minat belajar siswa yang menggunakan soal rutin dan non rutin pada model pembelajaran kooperatif tipe Rotating Trio Exchange.

Kata Kunci: *soal rutin vs non rutin, model pembelajaran kooperatif tipe Rotating Trio Exchange, minat siswa*

Introduction

A student in problem-solving must think, analyze the problem, find a formulation critically according to the problem, examine the formulation data and try to find a problem-solving strategy that allows getting a solution[1]. The trend of learning in mathematics today is learning that focuses on the active participation of students[2][3]. Students' problem-solving abilities are divided into two: problem-solving abilities on routine questions and problem-solving abilities on non-routine questions4.

Routine questions generally include the application of an application of a mathematical procedure that is the same or similar to what has just been learned, while in non-routine questions, to include the application of the correct procedure, deeper thinking is required [5][6]. Non-routine problems are more complex than routine problems, so strategies to solve problems may not appear directly and require a high level of creativity and originality from the problem solver[7]. Therefore, the most important goal of learning mathematics should be to build the ability of our students to solve problems[8]. According to Nguyen et al., non-routine questions cannot be solved using known methods and formulas[9]. Solving non-routine problems requires careful analysis, creative effort and using one or more strategies[10]. According to

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Rahmawatiningrum et al., solving non-routine problems requires higher thinking skills[11]. Non-routine questions are questions that, for a solution, additional reflection is needed because the procedure is not as clear or not as clear as the procedure learned in class.

The cooperative learning model is a learning model that requires students to learn and work in small groups collaboratively with a heterogeneous group structure[12]. Cooperative learning can improve student learning towards better learning, mutual assistance in some social behaviours, and can increase student interest in learning mathematics[13]. This learning model allows students to fully develop their knowledge, abilities, and skills in an open and democratic learning environment[14]. Students are no longer objects of learning but can also act as tutors for their peers[15].

The Rotating Trio Exchange cooperative learning model developed by Silberman is an in-depth way for students to discuss various problems with several classmates[16]. Silberman states that the Rotating Trio Exchange cooperative learning model is a learning model that can increase students' active participation during learning by optimizing small discussion activities between group members[17]. The Rotating Trio Exchange cooperative learning model is an effective way to change learning patterns in the classroom. This model is student-centred, leading students to interact, express, and express their own opinions, discover knowledge, and express it to friends[18]. Exchange (RTE) cooperative learning model is designed to make students active from

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the start of learning. Students can work together and help each other to build attention, arouse their curiosity, and stimulate students to think[19].

The research results by Dinç Artut explain that the cooperative learning model involving the completion of non-routine questions has a pleasant effect on students; students are more enthusiastic about learning mathematics[20]. Meanwhile, according to Klang et al., cooperative learning positively impacts student interest and strengthens friendships[21].

This study aimed to compare students' interest in mathematics using routine vs non-routine questions using the Rotating Trio Exchange type of cooperative learning model. In addition, researchers want to show prospective teachers and teachers that choosing the right learning model and assignment will impact students' interest in learning.

Method

This research is quasi-experimental. The population of this study were all students from Manipa SMP Negeri 3 with a sample of 44 students. The variable of this research is students' interest in learning. The research instruments were test questions, questionnaires and observation sheets.

Inferential statistics is one of the analytical methods used to conclude using a population sample. Inferential statistical analysis was used:

1) Normality test

The data normality test was conducted to determine whether the sample was normal. The data taken for the normality test is the student's interest in learning before and after learning with the Rotating Trio Exchange (RTE) Cooperative Learning model. A hypothetical normality test:

H_0: Data is normally distributed

H_1: Data is not normally distributed

Test Criteria:

a. If the significance is > 0.05, then the data is normal

b. If the significance <0.05, then the data is not normal

2). Homogeneity Test

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[19] Nor Fajariyatul Hasanah, Mohammad Edy Nurtaman, and Umi Hanik, "Pengaruh Model Pembelajaran Kooperatif Tipe Rotating Trio Exchange (RTE) Terhadap Hasil Belajar Dan Minat Belajar Matematika Siswa Kelas V SDN Pinggir Papas 1 Sumenep," *Widyagogik : Jurnal Pendidikan dan Pembelajaran Sekolah Dasar* 6, no. 2 (April 29, 2019): 112–21, https://doi.org/10.21107/widyagogik.v6i2.5195.

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The homogeneity test of the data was carried out to determine whether the research sample was homogeneous. The data for the homogeneity test is the student's interest before and after learning using the Rotating Trio Exchange type cooperative learning model. Hypothetical homogeneity test:

H_0: Homogeneous distributed data

H_1: Data is not homogeneously distributed

Test Criteria:

a. If the significance is > 0.05, then the data is homogeneous
b. If the significance is <0.05, then the data is not homogeneous

3). Wilcoxon test

The Wilcoxon test was conducted to test whether or not two paired samples had significantly different averages. The data analysis technique used in the nonparametric paired sample t-test is the Wilcoxon test.

H_0: There is no difference in the Rotating Trio Exchange cooperative learning model using routine and non-routine questions

H_1: There are differences in the Rotating Trio Exchange type of cooperative learning model using routine and non-routine questions

Test criteria: If the significance value (2-tailed) $< 0{,}05$, then H_0 is rejected.

4). An Independent test sample t-test was conducted to test the hypothesis about two or more populations, each of which is independent, which means that the two populations are unrelated and unrelated. The data taken for independent testing of the sample t-test is the interest in students' learning before and after using the Rotating Trio Exchange cooperative learning model.

Hypothetical Test Independent Test Sample t-test:

H_0: There is no difference in student interest in learning using routine and non-routine questions in the Rotating Trio Exchange cooperative learning model.

H_1: There are differences in student interest in learning using routine and non-routine questions in the Rotating Trio Exchange type of cooperative learning model.

Result and Discuss

Researchers collect data from questionnaires for routine and non-routine questions. The results of descriptive statistics from routine questions show that the lowest score of students' interest in learning is 50, the highest score is 80, the average value is 62.63, and the standard deviation is 8.54. While the results of descriptive statistics from non-routine questions show that the lowest student interest in learning is 50, the highest score is 89, the average value is 69.08, and the standard deviation is 11.81.

a. Normality test

The data normality test was conducted to determine whether the variable research data came from a normally distributed population or not. The normality test was carried out on the questionnaire data on two samples, routine and non-routine questions. As a result, before the hypothetical test was performed, the data normality test using the Kolmogorov-Smirnov[a] test was performed using SPSS. The test results show that the Kolmogorov-Smirnov[a] significance value on routine questions is $0{,}200 < \propto = 0{,}05$, then the data is normal, while the non-routine questions are $0{,}200 > \propto = 0{,}05$, which is normal..

b. Homogeneity Test

A homogeneity test is done to find out whether the same thing or not. The homogeneity test was carried out on the questionnaire data on two samples, routine and non-routine questions. The test results show that the significance value is $0{,}055 > \propto = 0{,}05$, so the distribution is homogeneous.

c. Independent Test Sample t-Test

An independent sample t-test was used to determine whether there was a difference in the average student interest in learning from the two unpaired samples. The test was conducted to fulfil the research objective, which aims to determine the differences in students' interest in learning using questions and non-routine questions in the Rotating Trio Exchange learning model. In this case, we can find out the difference in the results of routine and non-routine questions. Independent test data from the t-test sample were assisted using SPSS, with test results as follows:

Table 1. Results of Independent Sample T-Test on Routine and Non-Routine Questionnaires

Independent samples test

		Levene test for equality of variances		T-test for equality of means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Angket Soal	Equal variances assumed	3,884	,055	-2,075	42	,044	-6,45455	3,11014	-12,73106	-,17803

Rutin_Non Rutin	Equal variances not assumed			-2,075	38,253	,045	-6,45455	3,11014	-12,74933	-,15976

The test data results in the table above show that the significance value (2-tailed) is $0{,}044 < \propto = 0{,}05$, so H_0 is rejected. Thus, it can be concluded that there is a difference in the average learning interest of students who use routine and non-routine questions in the Rotating Trio Exchange cooperative learning model.

In this study, which was conducted to determine students' learning interests based on cooperation in the Rotating Trio Exchange cooperative learning model on non-routine problem solving, it was found that working in cooperative-based groups was effective on non-routine problem-solving skills. This finding is by the literature findings[22][23], which suggest cooperative learning methods are effective in teaching mathematics. Simamora emphasized that students generally improve their problem-solving skills when learning mathematics in groups based on cooperation[24]. They can solve more abstract problems and improve their mathematical understanding. Non-routine problems require more critical thinking and creativity[25]. Cooperative problem solving is useful for practising new problem concepts that require discussion and higher-order thinking skills[26]. Hence, it is possible to conclude that participating in cooperative groups supports solving these problems. Similarly, students in group experiments showed better problem-solving performance[27].

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According to Mastuti et al., the tendency to learn mathematics today is learning that focuses on active participation[28]. Routine problems generally involve applying identical or similar mathematical procedures to problems that are not studied, while in routine problems, achieving a good procedure requires more reflection[29]. So the strategy to solve the problem may not appear immediately and requires a high level of creativity and originality in problem-solving. Therefore, the most important goal of learning mathematics is to strengthen the ability of our students to solve problems[30]. Interest in learning is an individual machine to carry out learning activities to increase knowledge, skills, and experience. According to Azmidar et al., interest in learning has an important direct role, especially in mathematics[31].

The learning process coincides, and teacher and student observations are also carried out. The teacher's observation process is carried out by researchers with the observer's (colleagues) assistance. The results of the preliminary activity are known; namely, the researcher opens the lesson with greetings, the researcher prepares the students to pray and takes attendance, the researcher gives appreciation, the researcher gives motivation, and the researcher conveys the learning objectives. The results of the core activities are known; namely, the researcher poses basic questions, the researcher organizes students into several groups, the researcher does not facilitate students to make an activity schedule that refers to the agreed maximum time, the researcher monitors student activities while completing the project, the researcher does not conduct an assessment during monitoring carried out by referring to the assessment rubric and the researcher evaluates the students at the end of the lesson. The closing activity results were known; the researcher guided the students to conclude, ended the learning activity by giving a message to keep learning and asked the students to pray and closing greetings.

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After completing the teaching and learning activities, the researcher conducted a post-test to find students' interest in learning using the Rotating Trio Exchange learning model about routine and non-routine questions. According to two classes that were taught using the Rotating Trio Exchange cooperative learning model in routine and non-routine questions in this study, the researchers measured student interest in learning. Using the Rotating Trio Exchange cooperative learning model in routine questions with a total of 22 students, 15 students (68.13%) won a very good rating (A), four students (18, 18%) won a good score (B), three students (13.64%) obtained a sufficient record (C). The results of the post-test descriptive statistics showed that the lowest score was 60, the highest score was 100, the mean value was 82, and the standard deviation was 11.38. Meanwhile, in using the Rotating Trio Exchange cooperative learning model in non-routine questions with a total of 22 students, ten students (45.45%) won a very good rating (A), nine students (40.91%) got a good rating and a good rating. (B), Three students (13.64%) obtained sufficient notes (C). The statistical results of the descriptive post-test showed that the lowest score of students' interest in learning was 64, the highest score was 100, the average score was 77.27, and the difference was 9.47. Based on the hypothetical test results, it was carried out using the Wilcoxon test and the independent sample t-test. The Wilcoxon test result is a significance value (2-tailed) lower than <∝ = 0.05, so H_o is rejected. Thus, it can be concluded that there are differences in the Rotating Trio Exchange cooperative learning model using routine and non-routine questions. The descriptive statistics on routine questionnaires show that the lowest score of students' interest in learning is 50, the highest score is 80, the average value is 62.63, and the standard deviation is 8.54. While the results of descriptive statistics on non-routine questionnaires show that the lowest student interest in learning is 50, the highest score is 89, the average value is 69.08, and the standard deviation is 11.81. The results of the independent test sample t-test significance value (2-tailed) is 0.044 <∝ = 0.05, therefore H_o is rejected. Thus, it can be concluded that there is a difference in the average interest in student learning using non-routine routine questions in the Rotating Trio Exchange type cooperative learning model.

Conclusion

The difference in student interest in learning using routine and non-routine questions is known that the results of the questionnaire data test on student interest in learning show that the average value of an interest in learning in students who use routine questions is 62.63. In contrast, student interest in learning shows that the average interest for students who use routine questions is 69.08. Furthermore, the independent sample t-test show that the significance value (2-tailed) is 0,044 <∝ = 0,05, jadi H_o is rejected.

Thus, it can be concluded that there is a difference in the average learning interest of students who use routine and non-routine questions in the Rotating Trio Exchange type of cooperative learning model.

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