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THE EFFECTIVENESS OF THE *TGT* LEARNING MODEL ON LEARNING OUTCOMES ON THE MATERIAL OF RATIONALIZING THE DENOMINATOR OF ROOT FORM

Nabila Nurhaliza Ali [1], Ratna Yestina[2], Agis Mulyani[3] , Supratman *[4]
[1,2,3,4] Universitas Siliwangi

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ABSTRACT

Team Games Tournament (TGT) learning is well prepared with the proper procedures. It will be better than conventional methods, such as lectures that tend to be monotonous. This encourages researchers to conduct research with the title "The Effectiveness of the Team Games Tournament (TGT) Learning Model on Mathematics Learning Outcomes on the Material of Rationalizing Denominators of Root Forms." This study aims to analyze the effect of mathematics learning outcomes of class X IPA 1 MAN 1 Tasikmalaya City on the material of rationalizing the denominator of the root form presented with the Teams Games Tournament (TGT) learning model. The type of research used is pseudo-experiment research. Data collection techniques are done by observation and giving instruments in the form of pre-test and post-test questions and minute papers. The sample was taken with a purposive sampling technique so that 15 students were obtained as research subjects. Before conducting hypothesis testing, data requirements were first tested, including normality testing using SPSS 25 with the Shapiro-Wilk Test and homogeneity testing using SPSS 25 with the Shapiro-Wilk Test. Hypothesis testing using the t-test. The results of this study indicate that student learning outcomes in the material rationalize the denominator of the root form by using the Teams Games Tournament (TGT) learning model. There is a difference between the pre-test and post-test results.

Corresponding Author:

Name: Supratman,
Departement of Mathematics Education,
Universitas Siliwangi, Tasikmalaya, Indonesia
Email: supratman@unsil.ac.id
Phone Number : +62 812-2130-9123

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1. INTRODUCTION

Mathematics is one of the branches of science that acts as a subject that is a milestone in the progress of science and technology. Mathematics is an essential science because it is related to everyday life (Afriansyah, 2014; Apiati et al., 2019). Realizing this meaning, learning outcomes, especially mathematics subject matter, need attention (Ma'ruf et al., 2019; Rahayu & Afriansyah, 2014). Success in math subjects depends on various factors, including the students themselves, the subject, teachers and parents, and the teacher's teaching and learning strategies. Another factor that makes mathematics less interesting for students is that the approach teachers use in learning makes students bored and divert their attention outside of learning mathematics. Many students consider Mathematics as one of the most challenging subjects. They see Mathematics as uninteresting, difficult to learn, confusing, boring, and has no direct connection to everyday life. Students often only view Mathematics as procedural rules that must be memorized (Hariyani, 2018).

The teacher's routine is explaining, giving example problems, and giving exercises. Activities in learning are only one-way, without communication between students and teachers in solving existing math problems. The solution that teachers can do to overcome these problems is to change the learning model that will be applied. The learning model to be used is a model that can change students from passive to active. One of the learning models that involve students actively gaining the ability to learn mathematics and understand mathematical concepts correctly is the cooperative model.

The cooperative learning model is one of the learning models that can make students responsible and interested in participating in math lessons (Pirdaus & Afriansyah, 2016). The cooperative learning model is believed to help students understand complex concepts and helps foster awareness of critical thinking, cooperation, and helping friends. This is in line with the (Supriatna & Afriansyah, 2018) that through the application of cooperative learning models, cooperation between teachers and students can be improved so that students can better understand mathematical concepts. Luritawaty's (2018) opinion states that to overcome the problem of understanding mathematical concepts, cooperation between educators and students needs to be improved in the learning process.

In this case, the teams games tournament (TGT) cooperative learning model is considered capable of making students in a positive cooperative situation so as to increase team cohesiveness and each student is responsible for learning the lesson content. The TGT learning model can be easily implemented by teachers in the classroom, involving students as peer tutors. This model allows active participation of all students who have diversity (Yasa, 2014).

Some research related to the Teams Games Tournament (TGT) learning model shows positive results on learning outcomes, namely research conducted by (Asmawati et al., 2022) on the effectiveness of mathematics learning through the application of the teams games tournament (TGT) type cooperative model; (Amin & Suardiman, 2016) on differences in students' mathematics learning achievement in terms of learning styles and learning models; (Solihah, 2016) on the effect of the teams games tournament learning model on math learning outcomes; (Ernada et al., 2021) on the effectiveness of the teams games tournament learning model, 2021) on the effectiveness of the teams games tournaments learning model with ludo media on the mathematics learning outcomes of tiara bangsa batam college students; (Sofyan, 2022) on the effectiveness of the teams games tournament type cooperative learning model to improve learning outcomes. Some of these studies have in common with this study, namely both measuring the effectiveness of the teams games tournament model.

However, what makes it different is the research location, MAN 1 Tasikmalaya City, which is a new school and has never been studied about the teams games tournament (TGT) model.

This study was conducted with the aim of investigating the impact of the application of the Team Games Tournament (TGT) type cooperative learning model on students' mathematics learning outcomes, in connection with the problems previously described. The researcher hopes that the use of the TGT type cooperative learning model will have a positive influence on students of class X IPA 1 MAN 1 Tasikmalaya City on the material of rationalizing the denominator of the root form.

2. METHOD

The type of research used is experimental research (pseudo-experiment). The research method to be applied is quantitative research with a pseudo-experimental approach. The research design used is a pre-test and a post-test. The sample determination was carried out by purposive sample, namely students of class X IPA 1 MAN 1 Tasikmalaya City consisting of 15 students. By giving a pre-test question with as many as two questions. Researchers then conducted learning with the Team Games Tournament (TGT) model to students, then conducted a post-test to measure student learning outcomes. Data collection techniques are carried out by observation and giving instruments pre-test, pot-test questions, and unstructured interviews.

To process quantitative data, data processing techniques are processed using the SPSS Statistics 25 computer program carried out with the following steps:

a. Data entry into SPSS Worksheet
b. Data analysis with 95% confidence level
c. Data analysis is carried out to test the hypothesis that has been formulated to draw conclusions.

3. RESULTS AND DISCUSSION

In this study, the sampling technique used is purposive sampling. The sample is taken using purposive technique with spesific considerations or criteria. According to Rijal & Sofiarini (Nurmi et al., 2020), the data analysis technique using purposive sampling with one group pretest-postest design can utilize inferential statistics with a two way t-test, statistics parametric. The initial step before conducting parametrec statistics is to perform test of normality and homogeneity (Sugiyono, 2016).

Description of research data in the form of pre-test and post-test results using the TGT model as follows:

1) The data of students learning test results, both pre-test and post-test, who were taught using the TGT model comprehensively, can be seen in the table 1.

Tabel 1. Recapitulation of Students Mathematics Learning Test Result

	Pre-Test	**Post-Test**
Min	55	75
Max	100	100
Mean	80.67	89.53
Median	80	90
Range	45	25
Standard Deviation	13.48	8.04

2) Normality and Homogeneity Test of Pre-test and Post-test
Normality Test of Pre-test and Post-test

Based on the results of the normality test with SPSS, the Sig value of the students' pre-test with the Shapiro Wilk Test, obtained (0.191) is above 0.05, thus H_0 is accepted and H_1 is rejected, meaning that the data comes from a normally distributed population. While the post-test of students with the Kolmogorov-Smirnov Test and the Shapiro Wilk Test, obtained (0.208) are above 0.05, thus H_0 is accepted and H_1 is rejected, meaning that the data comes from a normally distributed population.

3) Homogeneity Test of Pre-test and Post-test

After the normality test was carried out in the class using the Teams Games Tournament (TGT) learning model, followed by the pre-test and post-test homogeneity test, the Sig value was above 0.05 so that H_0 was accepted and H_1 was rejected, meaning that the data came from a homogeneously distributed population.

H_0 : Data comes from a normally distributed population
H_1 : Data does not come from a normally distributed population

If the p-value (value in the Sig. column in the Tests of Normality table) < α, then reject H_0.

Table 2. Normality Test Results with Shapiro-Wilk Test

	Statistic	df	Sig.
Pretest	.920	15	.191
Posttest	.922	15	.208

Table 2. The results of the normality test with the Shapiro-Wilk method for the pretest variable were 0.191 (19.1%) and the posttest variable was 0.208 (20.8%), the Sig. (p-value) > 0.05. The conclusion is to accept H_0 (based on decision-making rules), meaning that the data comes from a nomally distributed population. The Sig value is above 0.05 so that H_0 is accepted and H_1 is rejected, meaning that the data comes from a homogeneously distributed population.

4) Hypothesis Test
To find out if there is a significant effect on learning outcomes, it is necessary to make a decision based on the T test.

Table 3. Pair T Test Results

		Mean	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper	Sig.
Pair 1	Pretest - Posttest	-8.867	12.099	3.124	-15.567	-2.166	.013

Based on testing the Teams Games Tournament (TGT) learning model variable on the material to rationalize the denominator of the root form has a p-value (in the Sig. column) of 0.013 such that the p-value is smaller than 0.05, so the conclusion is H_0 is rejected and H_1 is accepted, meaning that there is an influence on the Teams Games Tournament (TGT) learning model on student learning outcomes on the material to rationalize the denominator of the root form.

This study aims to determine the effectiveness of using the Team Games Tournament (TGT) learning model on learning outcomes in class X IPA 1 MAN 1 Tasikmalaya City. Based on the results of the final test that has been done, there is an increase in student learning outcomes using the Teams Games Tournament (TGT) learning model before and after learning. Before learning by using the TGT model, the average value of students was 80.67 and after learning by using the TGT model, the average value of students became 89.3 an increase of 8.63 better than before learning using TGT.

Based on the results of the study in general all students can answer questions well. This further proves that the Teams Games Tournament (TGT) learning model can improve student learning outcomes and students are more active and motivated in learning. Thus, it can be concluded that the application of the Teams Games Tournament (TGT) learning model can stimulate students' richer thinking.

4. CONCLUSION

Based on the results of the analysis and discussion that has been carried out, several conclusions can be drawn from this study:

1) From the student's response to the TGT learning model, from the minute paper data that has been obtained, the student's response to the Teams Games Tournament (TGT) learning model on the material of rationalizing the denominator of the root form of the student's response is excellent, this is said so because of the respondents 80% of the students agreed and felt happy with the TGT model learning model which can train students to be more active, students can learn to respect their friends' opinions by applying games in it. Thus, applying the Teams Games Tournament (TGT) learning model can provide a new atmosphere that can reduce student boredom during learning.
2) When viewed in terms of the average value of pretests and posttests using the Teams Games Tournament (TGT) learning model has increased. The average pretest result is 80.67 and after learning by using the TGT learning model the average posttest is 89.3.
3) Based on the Hypothesis Test that has been carried out testing the Teams Games Tournament (TGT) learning model variable on the material rationalizing the denominator of the root form has a p-value (in the Sig. column) of 0.013 more minor than the level of significance 0.05, meaning that there is an influence on the Teams Games Tournament (TGT) learning model on improving student learning outcomes on the material rationalizing the denominator of the root form.

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