ISSN:3026-0442

Proceedings of the 1st International Conference on Education, Science Technology And Health (ICONESTH 2023 Universitas Bina Bangsa Getsempena, Dec 12-14, 2023, Banda Aceh, Indonesia))

APPLICATION OF TEAM GAMES TOURNAMENT (TGT) LEARNING MODEL TO STUDENT LEARNING OUTCOMES ON THREE-DIMENSIONAL MATERIAL

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ABSTRACT

This study aims to determine the application of the *team games tournament* (TGT) learning model to the learning outcomes of students on three-dimensional material. Students of grade XII MIPA 5 SMA Negeri 9 Banda Aceh who were the sample of this study amounted to 29 people selected through the *purpose sampling* technique. The approach used in this study is a quantitative approach with pre-test and *post-test* research types Data collection techniques use tests, observation, and documentation. Through the Independent *Sample Test* output table, t is calculated |-13.453| > 1.703 t table with sig. (2-tailed) is 0.000 ($p < 0.005$) so it is significant. It can be concluded that the application of the *team games tournament* (TGT) learning model can improve student learning outcomes on three-dimensional material.

Keywords: *Team Games Tournament*, Learning Outcomes, Three-Dimensional Material

INTRODUCTION

Learning is a communication process between students and teachers and is based on several learning resources in the learning environment. In learning is closely related to the learning model, of course, to set strategies that will facilitate learning. Humans have various potentials, characters, and understanding in learning. Therefore, various ways of learning are carried out

by humans. Gagne (in Siregar and Nara, 2017: 7) states that, there are eight types of human learning methods as follows: 1) Learning gestures, 2) Learning stimuli and responses, 3) Learning chaining, 4) Learning verbal associations, 5) Learning to distinguish, 6) Learning concepts, 7) Learning postulates, 8) Learning to solve problems.

Learning outcomes are the abilities possessed by students after gaining learning experience. Learning outcomes according to Sudjana (2016) are skills possessed by a learner after gaining learning experience. The learning outcomes achieved by students from the activity resulted in changes in behavior expressed by scores / scores obtained from test results after the learning process. In addition, Nawawi (in Ahmad Susanto 2013: 5) emphasizes the understanding of learning outcomes stating that learning outcomes can be interpreted as the level of achievement of students when studying a subject at school, which is indicated by the number of points to be able to identify a certain number of subjects from the test results.

A three-dimensional is an object that has space. The third dimension includes concepts regarding position (point, line, plane), distance between points and so on. The position of a point is divided into two, namely the position of the point against the line and the position of the point against the plane.

Teachers greatly influence the success of an education. Teachers must create a good teaching and learning process and can provide good learning potential for students. Teachers should be able to guide and facilitate students, so that they can understand the abilities that exist in students. And can give the desire to students to be able to learn as well as possible. So that they can realize the desired ideals based on the abilities they have (Aunurrahman, 2010: 13).

In the teaching and learning process, teachers as educators must be responsible for the learning outcomes of students and students' knowledge related to the material that has been learned (Saktiningsih, 2015). But in reality, the teaching and learning process is still very much a problem and cannot be resolved properly as expected. The factors that cause this to happen are the teaching and learning process carried out by the teacher, as well as the difficulty of the material learned by students so that there is a lack of desire to learn in students.

This mathematics learning process should be handled more seriously, teachers as educators must prepare one type of learning that can be carried out so that students can achieve a better learning experience. For this reason, the right solution to these problems is needed to apply a learning model that can

improve student learning outcomes in the learning process and the opportunities given by students to be able to work together in doing tasks. One of the learning models that can be used in the learning process is the *Team Games Tuornament* (TGT) learning model. Slavin (2016) said that, TGT model learning consists of 5 components, namely: Presentation in front of classes, teams, games, tournaments, and team recognition.

By applying the *Team Games Tournament* (TGT) learning model, it is hoped that it can make students more enthusiastic in learning and not feel bored, because the learning model not only makes intelligent students stand out, but students with lower academic abilities also actively participate in this learning model. In addition, it makes students more enthusiastic in following the lesson, because in this learning the teacher has promised an award that will be given to the best students or groups. Students will also be happier in following lessons because of the games in the learning model.

In order to achieve the quality that has been designed, learning must use the following principles:

a) Focus on the learners
b) Developing students' creativity
c) Creating fun and challenging conditions
d) Value-charged, ethical, aesthetic, logical and kinesthetic
e) Provide a versatile learning experience through the application of various learning strategies and methods that are fun, contextual, efficient, effective and relevant.

Based on these principles, mathematics can help learners think systematically through an orderly and specific sequence. Mathematics can also develop the sensitivity, awareness or concern of learners to understand empirical phenomena encountered in everyday life. When maths is applied in real life, learners can solve any problem more easily and with greater control.

RESEARCH METHODS

This research is a quantitative research. Quantitative research is research that uses information in the form of quantitative numbers, to be able to predict population status or future tendencies. This study uses strategies such as mock experiments, where researchers use this method because the study does not use a control class or an experimental class, but only one class. The type of research you want to do is *pre-test* and *post-test*. Where it was done twice, before the experiment and after the experiment was carried out.

This study was conducted to determine the success of improving student learning outcomes by applying the *Team Games Tournament* (TGT) learning model to three-dimensional material in class XII SMA Negeri 9 Banda Aceh. The instruments used in this study are tests, observations, and documentation.

Test

The test that will be used is a test in the form of a description, given the description test students will be free to create their answers according to their respective creatives. In this study, the description test used as many as five questions. Data collection through test techniques will be carried out before and after the application of the TGT model. *Pre-test* is carried out to determine the picture of the initial ability of students without the application of the TGT model. While the *post-test* is carried out to determine the completeness of student learning outcomes after applying the TGT model. The test questions consist of 5 questions for the *pre-test* and 5 questions for *the post-test*. Scores will be given according to the difficulty of the questions. After being given a *pre-test*, the teacher will explain the material to be learned. Then, the teacher will direct students into predetermined teams according to the abilities of students. The tournament will start based on the group, the teacher will direct students to the tournament table and give question cards to students to answer on the plano paper provided. Then, the teacher will give a score to the correct group.

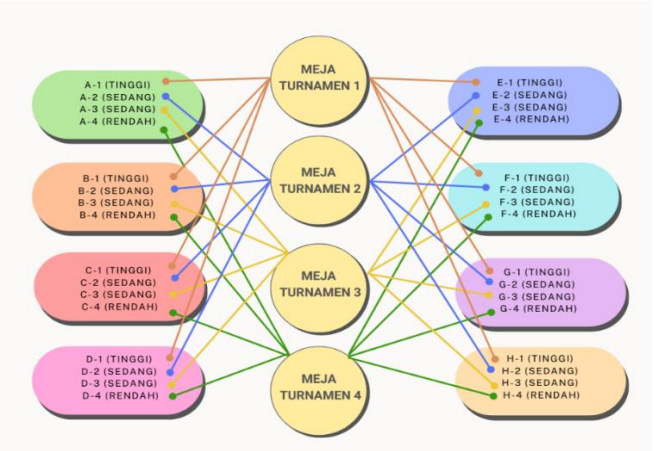

Figure 1. The scheme of the tournament to be carried out

Observation

Observation or observation is the process of activities that are observed to see how far the effect of actions that have been achieved according to the planned goals. Observations are observed directly during the learning process carried out by researchers. The observations made are related to student activities and teacher activities during the learning process. The observation techniques used are teacher activity observation sheets and student activity observation sheets.

Documentation

Documentation is the collection of data that is not directed directly against the subject of research. Documentation is one of the data collection techniques that aims to find some data related to the variables to be studied.

Data analysis is a method used to know how to describe a data. This is one of the most important stages in a study. The data obtained from the test results are analyzed by inferential analysis. This analysis was conducted to find out whether the TGT learning model can improve student learning outcomes. This analysis is carried out by comparing *pre-test* and *post-test* to find out whether student learning outcomes improve.

RESULTS AND DISCUSSION

This study aims to improve student learning outcomes by using the *Team Games Tournament (TGT)* learning model. The type of research conducted was *Pre-test and Post-test* in class XII MIPA 5 with a total of 36 students, consisting of 17 male students and 19 female students. However, during the study only 29 students were present.

At the first meeting before researchers used the *Team Games Tournament (TGT)* learning model, researchers gave *pre-test* questions about the Three Dimensional material to determine the initial abilities of students. During the learning process, researchers provided material and sample questions using the *Team Games Tournament (TGT)* learning model. At the second meeting, researchers formed a group to conduct the tournament. Each group is given several questions to solve according to their abilities. After the tournament, researchers gave *post-test* questions to see the improvement in student learning outcomes after being given the tournament.

Initial Test

After the researcher obtained student data, then the researcher gave a *Pre-test*. The test given is a learning outcome test in the form of a description test totaling 5 questions. The initial test is carried out with the aim of knowing the initial ability of students before applying the learning model. Students are given 15 minutes to do the test questions. In this situation, the researcher plays a direct role in the distribution of questions, answer sheets and supervises the state of the class.

Table 1. Average Results and Standard **Deviations *of Pre-test* Data Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	29	20	62	43.45	11.407
Valid N (listwise)	29				

Source: IBM SPSS Statistic Version 26 output

Based on the table above, it can be seen that, the lowest value of the *pre-test* data is 20 and the highest value is 62. With an average of 43.45 and a standard deviation of 1 1.407. The results of the data above are searched using the SPSS application by inputting values from excel into the SPSS application, then the values of the data will automatically come out.

Final Test

At this stage, the final test is given to the learners after the execution of the action. The implementation of this final test is carried out with the aim of determining the level of ability of students on learning outcomes. In this test, researchers provide tests in the form of description questions totaling 5 questions and the time given is 20 minutes.

Table 2. Average Results and Standard Deviations *of Post-test* Data Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Post-test	29	53	91	77.62	10.069
Valid N (listwise)	29				

Source: IBM SPSS Statistic Version 26 output

Based on the table above, it can be seen that, the lowest value of the *post-test* data is 53 and the highest value is 91. With an average of 77.62 and a standard deviation of 10.069. The results of the data above are searched using the SPSS application by inputting values from excel into the SPSS application, then the values of the data will automatically come out.

Normality Test

This test is carried out with the aim of assessing the distribution of data on the data of a group. If data n < 50 then Shapiro-wilk is used, but if a data n > 50 then Kolmogorov-Smirnov is used.

Normality Test Results Table

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistics	Df	Sig.	Statistics	Df	Sig.
Student Learning Outcomes	Pre-test	.105	29	.200*	.942	29	.114
	post-test	.150	29	.094	.939	29	.093

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: IBM SPSS Statistic Version 26 output

Shapiro-Wilk normality test decision making, namely:

1. If the significant value (sig) > 0.05, then the data is normally distributed
2. If the significant value (sig) < 0.05, then the data is not normally distributed

Based on the explanation above, the data is normally distributed due to the results of the normality test output obtained sig > 0.05.

Homogeneity Test

This test is done to see if a data has the same variance or not. The calculation results are based on significant values obtained briefly as follows:

Table 4.1.4 Homogeneity Test Results Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Student Learning Outcomes	Based on Mean	3.353	1	56	.072
	Based on Median	3.247	1	56	.077
	Based on Median and with adjusted df	3.247	1	52.077	.077
	Based on trimmed mean	3.405	1	56	.070

Source: IBM SPSS Statistic Version 26 output

The requirements for decision making in the homogeneity test are:

1. If the significance value (sig) at Base on Mean > 0.05 then the data is homogeneous
2. If the significance value (sig) in the Base on Mean < 0.05 then the data is not homogeneous

Based on the data above, it shows that, the data obtained is more significant, so this data can be said to be homogeneous.

Observation of Teacher **Activities**

The teacher activity observation sheet consists of 15 observation aspects, with a total of 4 assessment criteria. The results of observations on the learning process carried out by two observers on teacher activities during learning activities by applying learning using the *Team Games Tournament* (TGT) model can be seen in the following table:

Table 1. Observation Results of Teacher Activities

No	Meeting	Sum	Average	Criterion
1.	1	23	1,5	Enough
2.	2	41	2,7	Good

Based on the table above, it shows that the results of observations were made twice on teacher activities. At meeting 1 a score of 23 was obtained and at meeting 2 a value of 41 was obtained so that the average score at meeting 1 was 1.5 and the average score at meeting 2 was 2.7 which included the "sufficient" criterion for meeting 1 and the "good" criterion for meeting 2.

Information on the value of the data above, it can be stated that from the results of observations made by observers on the teacher's observation sheet, several aspects were found that the implementation was still not optimal for meeting 1 but at meeting 2 some aspects of implementation had gone well.

Observation of Student Activities

The student activity observation sheet consists of 18 aspects of observation, with a total of 4 assessment criteria. The results of observations on the learning process carried out by two observers on student activities during learning activities using the *Team Games Tournament* (TGT) model can be seen in table 2

Table 2. Results of Observation of Student Activities

No	Meeting	Sum	Average	Criterion
1.	1	48	2,6	Good
2.	2	63	3,5	Excellent

Based on the table above, it shows that the results of observations were carried out twice on student activities. At meeting 1 a score of 48 was obtained and at meeting 2 a value of 63 was obtained so that the average score at meeting 1 was 2.6 and the average score at meeting 2 was 3.5 which included the "good" criterion for meeting 1 and the "very good" criterion for meeting 2.

Explaining the value of the data above, it can be stated that from the results of observations made by observers on student observation sheets, several aspects were found that the implementation was still not optimal for meeting 1 but at meeting 2 some aspects of implementation had gone very well.

Table 3. ***Independent Sample Test***

Independent Samples Test

		Levene's 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
Student Learning Outcomes	Equal variances assumed	3.353	.072	-13.453	56	.000	-36.724	2.730	-42.192	-31.256
	Equal variances not assumed			-13.453	50.402	.000	-36.724	2.730	-42.206	-31.242

Based on the *Independent Sample Test* table, it is the main table of SPSS output that shows the results of the tests performed. This can be seen from the calculated t value of |-13.453| > 1.703 t table and significant (2-tailed) values on the table. The significance value (2-tailed) is 0.000 ($p < 0.05$). So that the *results of the pre-test and post-test* experience significant (meaningful) changes. So it can be concluded that there is an increase in student learning outcomes by applying the *Team Games Tournament* (TGT) model to the three-dimensional material of class XII MIPA 5 SMA Negeri 9 Banda Aceh.

Discussion of Results

The things that researchers do before carrying out these actions are to compile a learning implementation plan (RPP) for the material to be delivered and the researcher validates it with subject teachers at SMAN 9 Banda Aceh. Next, the researcher prepares the things that will be needed during the action and determines the time for the research to be carried out. Researchers need two meetings to be able to carry out these actions.

It can be seen from the pre-test results that the learning outcomes of students are still very low because most students have not been able to master the concept of three dimensions. Their ability when solving a problem, especially the problem of determining point to point, point to line, and point to field which results in students not being able to solve problems properly and precisely according to the indicators in the *Team Games Tournament* (TGT)

model. This initial test was conducted to determine the initial ability of students before researchers applied the *Team Games Tournament* (TGT) learning model.

The implementation of actions was carried out after the initial test, the action in this study was in the form of using the *Team Games Tournament* (TGT) learning model in learning activities. The final test is given after action with the aim of determining the improvement of the ability of student learning outcomes. From the results of the final test, researchers can find out that the learning outcomes of students using the *Team Games Tournament* (TGT) model are more improved than the learning outcomes of previous students.

CONCLUSIONS AND ADVICE

Based on the results of research and discussion that have been described in chapter IV which concerns the application of the *Team Games Tournament* (TGT) model on three-dimensional material to the learning outcomes of students in class XII SMA Negeri 9 Banda Aceh, it can be concluded that:

1. The calculated t value is |-13.453| > 1.703 t table and significant (2-tailed) values on the table. The significance value (2-tailed) is 0.000 ($p < 0.05$). So that the *results of the pre-test and post-test* experience significant (meaningful) changes. So it can be concluded that there is an increase in student learning outcomes by applying the *Team Games Tournament* (TGT) model to the three-dimensional material of class XII MIPA 5 SMA Negeri 9 Banda Aceh
2. The results of observations of teacher activities were carried out well according to the aspects that had been observed, the score obtained at meeting 1 was 23 with an average of 1.5 which was included in the "sufficient" criterion. However, at meeting 2, a score of 41 was obtained with an average of 2.7 which is included in the "good" criteria.
3. The results of observations of student activities were carried out very well in accordance with the observed aspects, at meeting 1 a score of 48 was obtained with an average of 2.6 which included the "good" criterion. However, at meeting 2 obtained a score of 63 with an average of 3.5 which is included in the criteria of "very good".

Based on the conclusions above, the author provides useful suggestions to improve the quality of mathematics learning, especially at SMA Negeri 9 Banda Aceh.

These suggestions are as follows:

1. It is expected that teachers can equip themselves by trying to apply the *Team Games Tournament* (TGT) learning model in the teaching and learning process in order to improve the learning outcomes of students at school.
2. It is hoped that other researchers who are interested in conducting this research further can modify the *Team Games Tournament* (TGT) model again so that it can improve student learning outcomes.
3. It is expected that readers or parties who work as teachers, so that this research becomes input in an effort to improve the quality of education in the future.

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