Influence Of Cooperative Learning Model Types Teams Games Tournament Quizizz's Help On Cognitive Science Learning Outcomes Of Junior High School Students

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Abstract

Type cooperative learning model Teams Games Tournament (TGT) is a learning model that involves the activities of all students and contains elements of play in small groups without any differences in status. Integration between types of cooperative learning models Teams Games Tournament (TGT) with Quizizz will make the learning process more fun and focused according to the stages of the learning model. This research aims to determine the effect of implementing a type of cooperative learning model Teams Games Tournament (TGT) assisted by Quizizz on the cognitive learning outcomes of junior high school students in science on vibration and wave material. This research design uses post-test only control group design with the type of research quasy experimental design. The research results show that the cooperative learning model is type Teams Games Tournament (TGT) has a significant influence on the cognitive science learning outcomes of junior high school students with a significance value (Sig.(2-tailed)) 0,000 < 0,005.

Keywords: Cooperative Learning Model type Teams Games Tournament (TGT), Quizizz, Student Cognitive Learning Outcomes

1. Introduction

Learning is a process of active interaction between students and their environment which is carried out in a programmed manner, and emphasizes the provision of learning resources (Dimyati & Mudjiono, 2006). However, in reality, there is still a lot of learning that is carried out subjectively or in one direction so that there is a lack of active interaction between students and teachers, or between fellow students. This learning can be carried out using various methods so that the process of imparting knowledge can be carried out effectively and efficiently with optimal results (Sugihartono et al., 2007). This is in accordance with the statement from Suprijono (2009) which states that activities in the learning process will be successful by using approaches from varied and student-centered learning models.

The 2015 TIMSS (Trends in International Mathematics and Science Study) research study stated that Indonesia ranked 44th out of 49 countries with an average score of 397 (Nizam, 2016). This score makes Indonesia ranked fourth from the bottom in science learning. The aim of the TIMSS study is to monitor the results of the education system related to the achievement of student learning competencies in the fields of Mathematics and Science and tested on 13 year old students. However, Indonesia did not participate in the 2019 TIMSS study, so the most recent TIMSS research study for Indonesia was in 2015 (Mullis, 2020). From the results of the TIMSS study, it is proven that students' abilities related to Mathematics and Science tend to be low. There are many factors that cause low science learning outcomes, one of which is because the models and methods used in the learning process are less varied (Khofifah et al., 2020).

A learning model that is fun and involves students actively through collaborative learning is the cooperative learning model. The cooperative learning model is a variation of learning strategy in which students work together in small groups to help each other understand learning, check and correct friends' answers, and other cooperative activities aimed at achieving high learning achievements (Slavin, 2005). There are several types of cooperative learning models, in this research the type used is type Teams Games Tournament (TGT). According to Solihah (2016), the TGT type cooperative learning model is a learning strategy that places students in study groups consisting of 4-5 students with different ability levels.

According to Slavin (2005), there are five components of the cooperative learning model type Teams Games Tournament (TGT), including:

1) Class Presentation (Class Presentation)

The same as classical learning in general, the class presentation is in cooperative learning type Teams Games Tournament also presented by the teacher. However, the teaching is more focused on the material being discussed. Students are required to be serious during class presentations because the material will be used during academic games.

2) Group (Team)

Group formation is structured on a small group scale consisting of 3-5 students, which is a mix of different students, in terms of academic achievement, gender, and other factors. In this group, students are required to work together in learning by discussing the material that has been presented and preparing all members to face tournament play. Usually, the teacher will give worksheets that students must work on in groups.

3) Game (Games)

Games or games What will be played is designed according to the material that has been presented to test students' knowledge after class presentations and learning in teams. There are various ways that can be designed in this TGT learning game according to the teacher's creativity. However, the game definitely contains quiz questions that come from the material that has been presented. If students succeed in answering the quiz correctly, they will get a score. These scores will be collected in the tournament.

4) Match (Tournament)

A match or tournament is the accumulation of points or scores from several games that have been competed. These tournaments are held at the end of the week or when the entire series of tasks and games have been completed.

5) Group Awards (Team Recognition)

Group awards or team recognition This is done by giving prizes or certificates as an appreciation to groups that have achieved predetermined criteria.

Application of the cooperative learning model type Teams Games Tournament (TGT) in this research was carried out with the help of Quizizz media as a fun evaluation tool and implemented a tournament system. According to Citra and Rosy (2020), Quizizz is an

educational application in the form of a quiz game that brings multiplayer activities to the classroom so that students can collaborate and make learning in the classroom more interactive and fun. Learning evaluation media with the Quizizz application can provide data and statistics regarding student performance and track the number of student answers (Purba, 2019). In this way, the use of the Quizizz application will be very suitable for implementing the cooperative learning model Teams Games Tournament (TGT) because it can be used as a learning tournament.

The combination of interactive media such as Quizizz Paper Mode can increase student motivation because it contains various learning game elements such as scores, leaderboard, and challenges. Apart from that, Quizizz Paper Mode also applies competition elements to its learning. Where for each question that has been answered a comparison of the student's score and ranking will be shown. This will trigger students' motivation to try to achieve better learning outcomes than their friends (Fauziah & Hadi, 2023).

Learning outcomes are changes in student behavior caused by the treatment applied after learning activities are carried out (Sudjana, 2014). These learning outcomes can also be explained by interpreting the two words that form them, namely the words "results" and "learning". Results refer to an acquisition as a result of carrying out a process or activity that makes functional changes to the input in the input, process and results cycle. This is also appropriate in teaching and learning activities, learning outcomes refer to changes in student behavior that occur after experiencing the teaching and learning process (Purwanto, 2009).

According to Benjamin S. Bloom (in Sudjana, 2014) classifies learning outcomes into three domains, namely cognitive, affective and psychomotor.

1) The cognitive domain relates to intellectual learning outcomes which consist of six aspects including knowledge or memory, understanding, application, analysis, synthesis and evaluation.

2) The affective domain is related to student attitudes produced through the learning process which consists of five aspects, including acceptance, answers or reactions, assessment, organization and internalization.

3) The psychomotor domain is related to learning outcomes in the form of students' skills and ability to act.

Cognitive learning outcomes themselves are learning outcomes related to thinking or intellectual abilities and memory. Based on the latest revised version of Bloom's Taxonomy, there are six domains in cognitive learning outcomes including remembering, understanding, applying, analyzing, evaluating and creating (Nafiati, 2021).

Science learning is a type of learning that requires students to have good cognitive abilities in order to be able to solve a problem that is presented. Science learning is an approach that can connect or combine various fields of science study into one topic (Ministry of National Education, 2011). Several fields of science study, including physics, chemistry and biology. These three areas of science study are provided in an integrated manner in schools to achieve science goals in a complete and comprehensive manner. However, it is not enough to teach

science knowledge alone, but you must also teach the process of how science is obtained through various learning activities.

Facts obtained through primary data at SMP Negeri 18 Malang show that so far the science learning process has been carried out using lecture and discussion methods. However, in the learning process there are some students who are less active in the learning process. This is of course an obstacle to the effectiveness of learning which will have an impact on student learning outcomes, especially in the cognitive domain. So it is necessary to have a model that is able to please and attract students' learning motivation, where this model is also expected to foster students' communication and collaboration skills. Therefore, this research aims to determine the effect of the cooperative learning model Teams Games Tournament with the help of Quizizz on the cognitive science learning outcomes of junior high school students.

2. Method

This research includes quantitative research using this type of research *quasy experimental design* (quasi-experiment), where there is a control group that cannot fully function in controlling external variables that influence the implementation of the experiment (Sugiyono, 2016). Meanwhile, the research design uses shapes *post-test only control group design*. This research divided into two classes where the experimental class was given treatment using a type of cooperative learning model *Teams Games Tournament* assisted by Quizizz, while the control class was given treatment using a type of cooperative learning model *Teams Games Tournament* without the help of the media. After being given treatment, both groups will be given a learning outcomes test in the form of *post-test.* The plan or design of this research can be seen in the following table:

Table 1. Experimental Design

Group	Treatment	*Posttest*
Experimental Class	X_1	O_1
Control Class	X_2	O_2

Information:

X_1 : Treatment 1 (TGT type Cooperative Learning assisted by Quizizz)

X_2 : Treatment 2 (TGT type Cooperative Learning without media assistance)

O_1 : Results *posttest* experimental class

O_2 : Results *posttest* control class

The experimental class was treated using TGT type cooperative learning assisted by Quizizz, while the control class was treated using TGT type cooperative learning without media assistance. After the treatment is carried out, a final learning outcomes test will be given (*post-test*) to find out the final results after TGT type cooperative learning is carried out.

This research was carried out at SMP Negeri 18 Malang in the odd semester of the 2023/2024 academic year. The population in this study were class VIII students at SMP Negeri 18 Malang with a total of 320 students divided into 10 classes. Meanwhile, research samples were taken using techniques *random sampling* which is carried out in a random manner without paying attention to the strata in the population, in other words, members of the population are considered the same. The sample in this study was class VIII H as the experimental class and class VIII G as the control class.

Data collection techniques used in this research include observation, documentation and tests. The student learning outcomes test instrument is tested first to determine the level of validity and level of reliability. Apart from that, analysis was carried out to test the level of difficulty of the questions and the differentiating power of the questions. The test instrument to measure science cognitive learning outcomes is a multiple choice test which is arranged based on the Bloom Taxonomy students' cognitive level, but only level C1 is used (*knowledge*), C2 (*comprehension*), C3 (*application*), C4 (*analysis*), and C5 (*synthesis*).

The data analysis technique used in this research is a prerequisite test in the form of a normality test using a test *Kolmogorov-Smirnov* and test homogeneity by test *Levene's.* Meanwhile, to test the research hypothesis, we use a test *Independent Samples T-Test* on IBM *Statistics* 24.

3. Results and Discussion

3.1 Result

INSTRUMENT ANALYSIS

Validity test

Based on trials of test instruments that have been carried out with the number of students, N = 32 and a significance level of 5%, r is obtained$_{table}$ = 0.367. . As a result of calculating the validity of the question items, the following results were obtained:

Table 2. Post-Test Question Validity Test Results

No. Question	r_{table}	r_{count}	Information
1	0,367	0,507	Valid
2	0,367	0,584	Valid
3	0,367	0,487	Valid
4	0,367	0,599	Valid
5	0,367	0,533	Valid
6	0,367	0,447	Valid
7	0,367	0,491	Valid
8	0,367	0,147	Invalid
9	0,367	0,496	Valid
10	0,367	0,363	Invalid
11	0,367	-0,007	Invalid
12	0,367	-0,018	Invalid
13	0,367	0,453	Valid
14	0,367	0,405	Valid

No. Question	r_{table}	r_{count}	Information
15	0,367	0,691	Valid
16	0,367	0,597	Valid
17	0,367	0,459	Valid
18	0,367	0,576	Valid
19	0,367	-0,355	Invalid
20	0,367	0,596	Valid
21	0,367	0,431	Valid
22	0,367	-0,018	Invalid
23	0,367	0,531	Valid
24	0,367	0,459	Valid
25	0,367	-0,018	Invalid

Based on table 2, of the 25 multiple choice questions with levels C1 to C5 that were tested, 18 questions were declared valid and 7 questions were declared invalid. The questions that were declared invalid were 8, 10, 11, 12, 19, 22, and 25. Meanwhile, there were 18 questions that were classified as valid, namely 1, 2, 3, 4, 5, 6, 7, 9, 13, 14 , 15, 16, 17, 18, 20, 21, 23, 24, and 25.

Reliability Test

The aim of the reliability test is to determine the level of consistency of the instrument answers. After analyzing the data using the KR-20 formula, the following data was obtained:

Table 3. Post-Test Question Reliability Test Results

	Test Reliability (r_{11})	r_{table}	Information
Soal Post-Test	0,780	0,367	Reliable

Test Difficulty Level

The results of the difficulty level of the questions are as follows:

Table 4. Post-Test Question Difficulty Test Results

No. Question	Difficulty Level	Information
1	0,62	Currently
2	0,55	Currently
3	0,69	Currently
4	0,34	Currently
5	0,69	Currently
6	0,66	Currently
7	0,55	Currently
8	0,41	Currently
9	0,28	Difficult
10	0,48	Currently
11	0,31	Currently
12	0,17	Easy
13	0,69	Currently
14	0,76	Difficult
15	0,55	Currently
16	0,41	Currently
17	0,76	Difficult
18	0,66	Currently
19	0,07	Difficult
20	0,24	Difficult
21	0,66	Currently
22	0,17	Difficult
23	0,72	Easy
24	0,76	Easy
25	0,17	Difficult

Based on table 4, it is known that there are 3 questions that are classified as easy, while there are 15 questions that are classified as medium, and there are 7 questions that are classified as difficult. So it can be concluded that from the results of the difficulty level calculation test, the question instrument has different levels of difficulty, namely easy, medium and difficult.

Discriminating Power Test

The results of the differentiating power test of the test instrument items can be seen from the following table.

Table 5. Post-Test Test Question Results

No. Question	Different Power	Information
1	0,421	Good
2	0,504	Good
3	0,402	Good
4	0,525	Good
5	0,475	Good
6	0,357	Currently
7	0,401	Good
8	0,038	Bad
9	0,416	Good
10	0,261	Currently
11	-0,109	Bad
12	-0,101	Bad
13	0,366	Currently
14	0,321	Currently
15	0,627	Good
16	0,520	Good
17	0,379	Currently
18	0,499	Good
19	-0,403	Bad
20	0,530	Good
21	0,340	Currently
22	-0,101	Bad

No. Question	Different Power	Information
23	0,454	Good
24	0,379	Currently
25	-0,101	Bad

Based on table 10, it is known that there are 12 questions that are classified as good, while there are 7 questions that are classified as moderate, and there are 6 questions that are classified as bad. Questions that have good and moderate criteria can be used at the research stage, while questions with bad criteria cannot be used

DATA DESCRIPTION

Student learning outcomes on vibration and wave material that has been treated are obtained through *post-test* can be seen in the following table.

Table 6. Data Description

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Experimental Class Post Test	33	56	94	73.21	9.959
Control Class Post Test	30	44	88	61.80	11.400
Valid N (listwise)	30				

Based on table 11, the average value can be seen *post-test* in the experimental class it was 73.21 with a total of 33 students. Meanwhile, the average value *post-test* in the control class it was 61.80 with a total of 30 students. Standard deviation *post-test* in the experimental class is 9.959 and standard deviation *post-test* control class is 11,400. For maximum value *post-test* obtained by students in the experimental class was 94 and the minimum score was 56. Meanwhile for the control class, the score *post-test* The maximum score obtained by students in the control class was 88 and the minimum score obtained by students was 44.

DATA ANALYSIS

The results of research regarding "The Influence of Type Cooperative Learning Models *Teams Games Tournament* Regarding the Science Learning Outcomes of Middle School Students" will be presented as follows:

Normality test

The normality test aims to find out whether the data collected is normally distributed or not. In this normality test, researchers used SPSS Statistics 24 with the test *Kolmogrov-Smirnov*. The results of the data normality test can be seen in the following table:

Table 7. Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
		Experimental Class Post Test	Control Class Post Test
N		33	30
Normal Parameters[a,b]	Mean	73.21	61.80
	Std. Deviation	9.959	11.400
Most Extreme Differences	Absolute	.149	.139
	Positive	.124	.124
	Negative	-.149	-.139
Test Statistic		.149	.139
Asymp. Sig. (2-tailed)		.062	.146

Based on table 12, the significance value of *post-test* experimental class is 0.062, where this value is greater than the significance level of 0.05 (0.062 > 0.05) so that the learning outcomes data *post-test* in the experimental class it was stated to be normally distributed. Meanwhile, in the control class, it is known that the significance value is 0.146, where this value is also greater than the 0.05 significance level (0.146 > 0.05) so that the learning outcomes data *post-test* in the control class it was stated to be normally distributed. Because the data in the experimental and control classes are both normally distributed, it can be continued to carry out parametric tests using the test *Independent Samples T-Test*.

Homogeneity Test

Homogeneity testing is carried out to determine whether the sample data has homogeneous variance or not. The homogeneity test in this study used a test *Levene's Test* in the SPSS Statistics 24 program with a significance level of 0.05. The results of the data homogeneity test are as follows:

Table 8. Homogeneity Test Results

Test of Homogeneity of Variances			
Levene Statistic	df1	df2	Say.
.274	1	61	.603

Based on table 13, the significance value obtained from the data homogeneity test is 0.603. This value is greater than α = 0.05 (0.603 > 0.05). So it can be concluded that each sample comes from a homogeneous population or has the same variation. This indicates that there is no difference in student abilities between the experimental class and the control class.

Hypothesis testing

To test this hypothesis using inferential statistics with tests *Independent Samples T*-Test on the SPSS Statistics 2024 program. The results of hypothesis testing from the data are as follows:

Table 9. Independent Samples T-Test Hypothesis Test Results

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Say.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.274	.603	4.241	61	.000	11.412	2.691	6.031	16.793
Equal variances not assumed			4.213	57.928	.000	11.412	2.709	5.990	16.834

Based on table 14, it is known that the significance value (Sig.(2-*tailed*)) on science learning outcomes of 0.000. Significance value (Sig.(2-*tailed*)) is less than α = 0.05 (0.000 < 0.05), then Ho is rejected and Ha is accepted. So it can be concluded that there is a significant influence from the application of the cooperative learning model *Teams Game Tournament* (TGT) assisted by Quizizz on the science learning outcomes of junior high school students.

3.2 Discussion

Students' Cognitive Science Learning Results Through the Implementation of the Teams Games Tournament Type Cooperative Learning Model Assisted by Quizizz

Researchers provide test questions on learning outcomes (post-test) at the end of the second meeting to find out the results of cognitive science learning after being treated with the application of the cooperative type learning model Teams Games Tournament. Class VIII G is an experimental class that uses a type of cooperative learning model Teams Games Tournament with the help of Quizizz obtained an average score of 73.21. Meanwhile, class VIII H is the control class which uses a type of cooperative learning model Teams Games Tournament without media assistance, the average score was 61.80. This means that the average scores of students in the experimental class and control class have a significant difference, where learning in the experimental class is more efficient. The increase in learning outcomes in the experimental class shows that the implementation of the cooperative type learning model Team Games Tournament with the help of Quizizz can help students improve cognitive science learning outcomes.

Factors that cause an increase in learning outcomes after implementing the cooperative type learning model Teams Games Tournament with the help of Quizizz, one of which is high student involvement or participation because the media used in learning is interesting. These results are in accordance with the opinion of Fadly (2020) who stated that the Quizizz application has interesting content and grades on quizzes that can be seen immediately after

answering the questions. This makes students have higher motivation to beat other groups because the scores on Quizizz are visible.

The Influence of the Teams Games Tournament Type Cooperative Learning Model Assisted by Quizizz on Students' Cognitive Science Learning Outcomes at SMP Negeri 18 Malang

The research data that has been obtained and analyzed becomes a reference for researchers to determine whether or not there is an influence of the type of cooperative learning model Teams Games Tournament with the help of Quizizz at SMP Negeri 18 Malang. Hypothesis test results using test Independent Sample T-Test shows the significance value (Sig.(2-tailed)) of 0.000. Significance value (Sig.(2-tailed)) is less than $\alpha = 0.05$ ($0.000 < 0.05$), so it can be concluded that the cooperative learning model is type Teams Games Tournament The assistance of Quizizz has a significant influence on improving cognitive science learning outcomes regarding vibrations and waves at SMP Negeri 18 Malang.

The results of this research are in accordance with previous research, namely research from Rizal Dzul Fadly (2020) entitled "The Effect of Using the Quizizz Application on the Cooperative Learning Model Teams Games Tournament on the Learning Outcomes of Class XI MIA SMAN 1 Gowa Students (Study of the Main Material of Buffer Solutions). In this research, the results obtained were that there was an influence of using the Quizizz application on the learning outcomes of class XI MIA students at SMAN 1 Gowa. This is because students in the experimental class using the Quizizz application in the TGT model participate and are more active in the learning process compared to the control class using the TGT model without media assistance. Type cooperative learning model Teams Games Tournament combined with interesting educational and fun media will help increase learning motivation and student activity so that learning outcomes can be improved.

Other research that supports this research is from Putri Yunisda Mawarni, et al, (2023) entitled "Application of the Learning Model Team Game Tournament Helped by Quizizz to Improve Student Learning Outcomes". This research shows that the application of the learning model Teams Games Tournament (TGT) with the help of Quizizz can improve the activity results and learning outcomes of grade 3 students at SDN Bulukidul.

This research is also supported by the opinion of Slavin (2015) who states that the cooperative learning model is a learning strategy where students work together in small groups to help each other understand learning, check and correct friends' answers, as well as other collaborative activities with the aim of achieving high learning achievement. A combination of types of cooperative learning models Teams Games Tournament Using Quizizz media makes students' learning motivation higher and cognitive learning outcomes increase. The application of this model is also able to foster collaboration and communication skills as well as active student involvement in the learning process.

The advantage in carrying out this research is the application of the cooperative type learning model Teams Games Tournament assisted by Quizizz Paper Mode is something new that has never been done by other researchers. The use of Quizizz Paper Mode does not require device like smartphone for students so that it will make its application very easy. Meanwhile, the weakness of this research is that the allocation of limited learning time is less than optimal.

This causes the implementation of the stages to take a long time and at the end of the delivery post-test There is only a little time left for students to do it.

4. Conclusion

Based on the results of research on "The Influence of Type Cooperative Learning Models Teams Games Tournament With the help of Quizizz on the Cognitive Science Learning Outcomes of Middle School Students, it can be concluded that the cooperative learning model is a type Teams Games Tournament has a significant influence on improving cognitive science learning outcomes for junior high school students regarding vibrations and waves. Students' cognitive learning outcomes using the cooperative learning model Teams Games Tournament (TGT) assisted by Quizizz is better than the cognitive learning outcomes of students using the cooperative learning model Teams Games Tournament (TGT) without the help of the media. In this study, the average score obtained from the experimental class was 73.21 and the average score from the control class was 61.80, thus indicating that there was a difference in the average scores obtained. Meanwhile, obtaining hypothesis test results using tests Independent Samples T-Test it is known that the significance value (Sig.(2-tailed)) of 0.000 < 0.05 then shows that Ho is rejected and Ha is accepted.

There are several suggestions after conducting this research. For teachers, if the teacher wants to apply a type of cooperative learning model Teams Games Tournament in class, you must create appropriate scenarios and learning media so that the learning process runs optimally. Students are required to be actively involved in the learning process so that learning outcomes can increase. For future researchers, it is hoped that they can look for updates with different assessment indicators so that they are useful for future learning.

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