
The influence of teams games tournament learning model on middle school students' mathematics interest and learning outcomes

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ABSTRACT

This research is motivated by the lack of student interest in mathematics which results in low student learning outcomes. Selection of the right learning model will affect the success of the learning process. Researchers use a team learning model that involves all students to actively participate in the learning process, namely the Teams Games Tournament Learning model. This study aims to determine the effect of applying the Teams Games Tournament learning model to the interests and learning outcomes of students in class VIII SMPN 2 Ngantru Tulungagung. This study uses a quantitative approach, the type of research is Quantitative Experiment. In taking the sample, simple random sampling technique was used, with class VIII A as the experimental class and class VIII B as the control class. Data collection techniques using tests and questionnaires. The analysis technique used is the Manova Test. Through the Manova Test results can be obtained. There is a significant influence regarding the use of the Teams Games Tournament Learning Model on Learning Interest and Students' Mathematics Learning Outcomes..

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1. INTRODUCTION

Education is a conscious and planned effort to create an active learning Education today is experiencing very rapid development (Rudiansyah, 2016). Quality education requires new things in learning that can adapt to eras, especially the era of the digital society 5.0 revolution (Keban, 2022). Education can be defined as a conscious and planned effort to create an active learning atmosphere and learning process (Abd Rahman, et al. 2022). Learning itself means a process marked by changes in a person. These changes are related to changes in behavior, skills, abilities and other aspects of the individual. An educational goal will not be successful without a learning process. The goal of education in general is to achieve a complete human being, nothing else but to motivate humans to always develop their natural potential to the maximum through continuous education, both through learning in the classroom and learning outside the classroom, this meaning can also be called lifelong education (Munir Yusuf, 2018).

Meanwhile, learning is a process of educational interaction between two elements, namely students who learn and teachers who teach and takes place at a certain time in order to achieve learning objectives (Ahdar, 2019). It can also be said to be assistance given by teachers to students to gain knowledge (Endang, 2014). Learning activities are

related to how to make students learn more easily and are encouraged to learn what is actualized in the curriculum according to student needs. Therefore, learning seeks to optimize student learning activities in order to develop the potential that students have (Hidayatullah, 2008).

The learning process in general will be experienced by someone wherever and whenever (Moh. Suardi, 2018). When the learning process takes place, teachers will meet many students' characters, from their interest in learning, ability to communicate with peers, family background, so that these things will influence mastery of the material presented (Roos M. S., 2015). Therefore, learning outcomes not only include what the teacher conveys to students, but also how students process the information received. Teachers are essentially role models for students (Dea & Kiki, 2020). The teacher's role in the learning process is not only to provide information, but also to guide students so that they can actively participate in the learning process. So it can be concluded that the choice of learning model greatly influences the success of a learning process or greatly influences student learning outcomes.

Apart from being related to the learning model used, subjects also influence students' interest in learning and learning outcomes. In this research the researcher will focus on learning Mathematics. One of the goals of learning mathematics is solving problems which includes the ability to understand problems, design mathematical models, complete models, and interpret the solutions obtained (Delyana, 2015). Mathematics plays an important role in student character education (Santoso, 2020). As time progresses, mathematics is involved by scientists when looking for solutions faced by society (Pratiwi, 2018). Because mathematics plays an important role in improving the quality of human resources who have competencies as the basis of their education which include: analytical, individual competencies, the ability to act, process information and organize change (Firma, 2019). Apart from that, mathematics contributes to facing the very rapid development of science and technology. Based on research results (Rahayu & Kusuma, 2019), the era of globalization encourages humans to be able to compete reliably, so it is necessary to learn mathematics that involves critical, logical and creative thinking. Mathematics itself is a scientific discipline that can improve the ability to think and argue and contribute to matters related to everyday life.

The application of mathematics is not only to fulfill educational goals at school, but will also be useful in everyday life, in the world of work and supports the development of knowledge. Therefore, mathematics as a basic science needs to be mastered by students well, especially since elementary school (Ahmad Susanto, 2013). In mathematics learning, there must be a connection between students' previous learning experiences and the concepts to be taught. In Mathematics, concepts are related to other concepts, therefore students are expected to understand each concept presented. Nowadays, many students think that Mathematics is a subject that is difficult or not easy to understand and quite a few think that Mathematics is a frightening specter (Maisaroh Rezyekiyah & Izwita Dewi, 2022). This requires teachers to create conducive classroom conditions so that students do not get bored or bored, this could happen because the delivery is less interesting (Rahmatika, et al, 2022). Apart from that, teachers are expected to be able to foster students' interest in learning Mathematics.

Furthermore, each learning activity will produce output in the form of learning outcomes. Learning outcomes are competencies, abilities and skills after experiencing learning (Molstad & Karseth, 2016). Changes in learning outcomes can be observed, proven, and measured in the abilities or achievements experienced by students as a result

of learning experiences (Nemeth & Long, 2012) which are built through the learning process (Singh, Srivastava, & Singh, 2015). There are several factors that influence learning outcomes, namely: external factors and internal factors. External factors themselves consist of teacher quality, learning models used and teaching methods. Meanwhile, the internal factors are talent, interest, motivation and way of learning. With the theory explained above, it can be concluded that choosing the right learning model will influence students' interest and learning outcomes (Toto Sugiarto, 2020).

The general definition of interest is a feeling of attraction, liking, attention (Lian & Huang, 2016), focus, persistence and behavior regulation (Wang & Adesope, 2016). Meanwhile, interest in learning is a desire that encourages someone to play an active role in the learning process. If someone is interested in something, in the process they will tend to focus actively and have a sense of curiosity, this will have a positive impact on the results obtained. Interest in learning is a student's complete engagement with all the powers of thought, and all his attention to acquiring the knowledge and scientific knowledge that he demands while at school (Makmum Khairani, 2013). Interest itself can also be said to be the overall driving force within the student which will give rise to learning activities, which guarantees learning activities and which gives direction to learning activities, so that the goals desired by the learning subject are achieved. Because learning outcomes will be maximum if they are accompanied by the right interests (Rusman, 2015). From the explanation above, it can be concluded that interest in learning has a big influence on the success of a learning process. Therefore, to overcome students who are less interested in learning, teachers should create a pleasant atmosphere so that students do not get bored and bored, one of which is by replacing conventional learning models which tend to be monotonous. and does not really require student participation with other learning models.

In this research, what will be discussed is a game-based cooperative learning model, namely Teams Games Tournament. TGT type cooperative learning consists of 5 components, namely: class presentation, Team, Game, Tournament, and Team Recognition (Slavin, 2010). The Teams Games Tournament (TGT) cooperative learning model is a cooperative learning model that is easy to implement, because it involves all students without any social differences, involves students, and contains elements of play and reinforcement. Some learning tools that support the learning process include learning program designs, teaching materials for class presentations, group activity work assignments, academic tournament worksheets and student learning achievement test sheets. Next, the teacher can divide students into several groups according to academic ability, so that later in one group there are students who have high, medium and low academic abilities (Aprilia, 2010)

The Teams Games Tournament learning model has several advantages, including: a) Increasing students' feelings or perceptions that the results obtained are the result of efforts made and not just luck, b) Increasing basic skills, achievements, active interaction between students, and processes. acceptance of different opinions between students, c) increasing verbal and nonverbal cooperation with other students, d) Higher student involvement in the learning process, even though it takes a little longer than other learning models (Nur Hafizah, 2012). From several advantages of the TGT learning model, choosing this learning model is considered effective for understanding students, because usually someone understands better if it is explained to them by their peers, and if they still don't understand, students also feel they won't be embarrassed or hesitate if they ask their friends again.

From the explanation above, to increase interest which will also have an impact on learning outcomes for Mathematics subjects which are considered difficult, the author is interested in knowing the effect of the learning model applied to overcome this problem. This learning model will focus on the Teams Games Tournament cooperative learning model on students' learning interest and learning outcomes in Mathematics learning. The Teams Games Tournament learning model is considered appropriate because it can increase students' interest so they are more interested in Mathematics subjects. If students are interested in Mathematics subjects, this will have a positive impact on the students' learning outcomes. Thus, the hypothesis used in the research entitled The Influence of the Teams Games Tournament (TGT) Learning Model on Students' Interest in Learning and Mathematics Learning Outcomes, namely H1: Application of the Teams Games Tournament (TGT) Learning Model has an influence on the Learning Interest and Mathematics Learning Outcomes of Class VIII SMPN 2 Students Ngantru Tulungagung. H0: Implementation of the Teams Games Tournament (TGT) Learning Model has no effect on Learning Interest and Mathematics Learning Outcomes of Class VIII Students at SMPN 2 Ngantru Tulungagung.

2. METHOD

The type of approach that will be used in this research is quantitative research and the type of research used is Quantitative Experimental research. Experimental research is quantitative research used to determine the effect of independent variables in the form of treatment on independent variables. The main characteristics are usually control, manipulation and observation. An example that often arises is to find out particular learning model on student learning achievement (Sugiyono, 2013). In this case, the research population is all class VIII students at SMPN 2 NGANTRU, totaling around 90 children. The sampling technique used is random sampling technique. With a sample size of 54 children. The research object in this study consists of 3 variables, namely the independent variable is the Influence of the Teams Games Tournament Learning Model (X), the dependent variable is students' interest in learning mathematics (Y₁) and students' mathematics learning outcomes (Y₂). The stages in this research began with 1) Carrying out observations at SMPN 2 NGANTRU 2) Developing research instruments that will be used to find the scores for each variable.

To collect data on learning interest, researchers use a questionnaire instrument. To collect data on learning outcomes, researchers use test instruments. 3) Validate research instruments that are ready to be tested on experts (validators from campus). 4) Conduct questionnaire tests and test questions that have been validated on students as To obtain the score value for each variable, to obtain the score data for each variable, indicators are determined first, from these indicators the question items are arranged according to the existing indicators. The research instrument grid can be seen in the following table :

Table 1. Questionnaire Instrument Grid

No.	Indicator	Item Number
1.	Feeling happy learning	1, 2, 3, 4, 5, 6, 7
2.	Student interest	8, 9, 10, 11, 12, 13
3.	Student interest	14, 15, 16, 17, 18, 19, 20

Table 2. Test Instrument Grid

No.	Indicator	Item Number
1.	Describes the Pythagorean theorem formula	1
2.	Shows the sides of a right triangle	2
3.	Determine the value/calculate the sides of a right triangle	3
4.	Calculating the length of the diagonal of a flat shape	4
5.	Solve problems related to the application of the Pythagorean theorem to everyday life	5

After all the instruments have been tested and obtained scores, the next thing to do is analyze the data. In the data analysis carried out there are several stages, namely 1) Instrument testing, in instrument testing there are 2 stages, namely the validity test which is useful for finding out whether the instrument used is valid or not, the second stage is the reliability test which aims to find out whether the instrument is reliable and can be used in the long term or not. Validity test with a significance value ≤ 0.05 then the instrument is declared valid and reliability test with Cronbach's Alpha > 0.70 then the instrument is declared reliable (Siyoto, 2015). 2) Prerequisite Test, in this prerequisite test there are also 2 stages, namely the normality test and the homogeneity test. The normality test is used to determine whether the data used is normally distributed or not, using the One-sample Kolmogorov-Smirnov Test with normal criteria if the significance value is > 0.05 . Likewise, in the homogeneity test, which is used to determine whether the data used is homogeneous or not by using Levene's Test of Equality of Error Variances, the data resulting from the analysis can be said to be homogeneous if the significance value is > 0.05 . The manual formula used to test homogeneity is:

The calculation results are compared with the table at a significance of 5%, namely H_0 is accepted if the count $<$ table, and H_0 is accepted if the count $<$ table. 3) Hypothesis testing, the data analysis technique used to test the hypothesis is the Manova Test via Multivariate Test in which there are several criteria, namely the significance value of the Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root columns is smaller than 0.05. So the decision H_0 is rejected and H_1 is accepted, which means there is an influence. Vice versa if the significance value of the Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root columns is greater than 0.05. Thus the decision H_0 is accepted and H_1 is rejected, which means there is no influence. And also through Tests of Between-Subject Effect, the significance value is <0.05

3. RESULTS AND DISCUSSION

The data used to determine whether there is an influence or not on research is obtained from questionnaires and test instruments. Questionnaires and tests were distributed to 52 samples consisting of 25 students in class VIII A and 27 students in class VIII B at SMPN 2 NGANTRU. A questionnaire instrument that uses a Likert scale consisting of positive and negative statements, with several alternative answers, namely strongly agree (SS), agree (S), doubtful (RR), disagree (TS), and strongly disagree (STS) . For positive statements SS is worth 5, S is worth 4, RR is worth 3, TS is worth 2, STS is worth 1. Meanwhile for negative statements SS is worth 1, S is worth 2, RR is worth 3, TS is worth 4, STS is worth 5.

Table.3 Mathematics Questionnaire Data for Class VIII A and VIII B Studentst

Number.	Experimental Class	Mark	Number	Control Class	Mark
1.	AX	85	1.	AJR	70
2.	AIM	80	2.	AEO	80
3.	APP	90	3.	AP	65
4.	ADA	70	4.	APS	65
5.	AROR	80	5.	BAM	75
6.	AGM	85	6.	DAR	70
7.	AP	65	7.	DSW	75
8.	ACA	85	8.	EX	75
9.	DS	80	9.	FNS	75
10.	FAR	90	10.	HAP	70
11.	IR	70	11.	J	85
12.	KS	85	12.	KKDS	60
13.	LFP	75	13.	MJEP	65
14.	MF	85	14.	MDA	65
15.	MSY	70	15.	MFF	75
16.	MDS	75	16.	MDNP	85
17.	MRR	80	17.	MCM	75
18.	NF	75	18.	MIA	70
19.	P	70	19.	MRK	75
20.	PFO	80	20.	MFI	70
21.	RFR	80	21.	ONS	60
22.	RAPW	75	22.	RAP	70
23.	RDP	85	23.	RJP	70
24.	RH	90	24.	RP	65
25.	SNW	80	25.	RWM	80
26.			26.	SGA	70
27.			27.	VMF	60

Based on the questionnaire scores obtained, prerequisites can be tested, namely in the form of normality tests and homogeneity tests. The results of normality test data analysis using the One-sample Kolmogorov-Smirnov Test obtained a significance value of 0.108, which means it is normally distributed, because the criterion for normally distributed data is if the significance value is > 0.05 . Furthermore, the results of the homogeneity test data analysis using Levene's Test of Equality of Error Variances, obtained a significance value of $0.795 > 0.05$ or it can be said that the data resulting from the analysis is homogeneous. The following is data on students' Learning Interest Questionnaire Scores, namely:

Table 4. Mathematics Post Test Results for Class VIII A and VIII B

Number.	Experimental Class	Mark	Number	Control Class	Mark
1.	AX	81	1.	AJR	70
2.	AIM	72	2.	AEO	60
3.	APP	88	3.	AP	71
4.	ADA	73	4.	APS	45

Number.	Experimental Class	Mark	Number	Control Class	Mark
5.	AROR	70	5.	BAM	59
6.	AGM	61	6.	DAR	46
7.	AP	58	7.	DSW	52
8.	ACA	81	8.	EX	52
9.	DS	57	9.	FNS	60
10.	FAR	88	10.	HAP	45
11.	IR	81	11.	J	40
12.	KS	82	12.	KKDS	67
13.	LFP	64	13.	MJEP	80
14.	MF	61	14.	MDA	44
15.	MSY	64	15.	MFF	67
16.	MDS	50	16.	MDNP	43
17.	MRR	60	17.	MCM	50
18.	NF	60	18.	MIA	40
19.	P	56	19.	MRK	72
20.	PFO	64	20.	MFI	49
21.	RFR	61	21.	ONS	56
22.	RAPW	68	22.	RAP	50
23.	RDP	73	23.	RJP	54
24.	RH	81	24.	RP	63
25.	SNW	70	25.	RWM	74
26.			26.	SGA	60
27.			27.	VMF	51

Based on the test scores obtained, prerequisites can be tested, namely in the form of normality tests and homogeneity tests. The results of normality test data analysis using the One-sample Kolmogorov-Smirnov Test obtained a significance value of 0.86, which means it is normally distributed, because the criterion for normally distributed data is if the significance value is > 0.05 . Furthermore, the results of the homogeneity test data analysis using Levene's Test of Equality of Error Variances, obtained a significance value of $0.674 > 0.05$ or it can be said that the data resulting from the analysis is homogeneous.

From the questionnaire data, it was found that the average score for students' interest in learning mathematics in the control class was 56.30 and the experimental class was 68.96 with a difference of 12.66. Meanwhile, from the test data, the average score for mathematics learning outcomes for control class students was 71.11 and the experimental class was 79.4 with a difference of 8.29. Based on the test results of the Test of Between-Subjects Effects, the relationship between the Teams Games Tournament learning model gives an F of 1695.281 with a significance of 0.000 on the interest questionnaire. And F is 5817.866 with a significance of 0.000 on the interest questionnaire. for the Tests Of Between-Subject Effect criteria, the significance value is < 0.05 . Thus, the decision H_0 is rejected and H_1 is accepted, which means that there is an influence of Teams Games Tournament learning on learning interest and mathematics learning outcomes for class VIII students at SMPN 2 NGANTRU for the 2021/2022 academic year. This shows that the Teams Games Tournament learning model applied in the experimental class has a significant influence on student learning outcomes and student interest in learning

compared to conventional learning applied in the control class. This is because in the experimental class which uses the Teams Games Tournament learning model students can play a role and participate actively in the learning process such as discussing with friends, asking questions if they do not understand and working on questions given by the teacher in turns with their team. Unlike conventional classes, you only focus on the teacher's explanation. Even though teachers give students the opportunity to ask questions if they don't understand the explanation that has been presented, some children tend to be shy or ask questions. Meanwhile, in the Teams Games Tournament learning model, because it has been divided into several groups, students who don't understand can ask their friends. This is a strategy to make it easier for students to understand the lessons that have been taught because usually students understand more easily and are not embarrassed to ask questions if their peers explain it.

Active student involvement in the learning process makes students feel needed so that they are interested in taking part in the lesson. Apart from that, tournaments created by teachers also make students more interested in learning because there are prizes to be won if students can solve the questions. The desire to learn makes students curious, focused and interested so that they ultimately understand the material presented by the teacher, this will later influence student learning outcomes. Apart from that, the Teams Games Tournament learning model also results in students becoming more courageous in expressing opinions and expressing anything they have not understood during the learning process.

As for the learning process in the experimental class, students receive guidance according to what is required, namely in the initial stage the teacher presents the material in front of the class, here the material presented is related to the Pythagorean Theorem. Next, the teacher divides the students into several groups with varying levels of intelligence, for example group 1 consists of 6 people with two people having high learning abilities, 2 people having medium learning abilities, and 2 people having low learning abilities, after that the teacher gives questions. which can be done together in groups in turns. When time runs out, the scores obtained by each group will be calculated. The group that gets the highest score will later get a prize that has been prepared by the teacher. Another advantage when implementing the Teams Games Tournament learning model is that it has a positive effect on students' cognitive learning outcomes because student participants gain knowledge through direct experience and not just hearing and receiving knowledge or information from what the teacher says in research. However, there are several drawbacks to this Teams Games Tournament learning model, namely that it takes a relatively long time due to delivering the material and dividing groups and then the tournament can be held.

4. CONCLUSION

Based on the results of research that has been carried out regarding the influence of the Teams Games Tournament learning model on students' interest in learning and mathematics learning outcomes at SMPN 2 Ngantru Tulungagung for the 2021/2022 academic year, it was found that there is an influence between the Teams Games Tournament learning model on students' interest in learning and students' mathematics learning outcomes. It can be seen from the results of the MANOVA test that was carried out, namely that a significance value of 0.000 or less than 0.005 was obtained. This indicates that H_0 is rejected and H_1 is accepted or that there is an influence of the Teams

Games Tournament learning model on students' interest in learning and mathematics learning outcomes at SMPN 2 Ngantru Tulungagung.

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