

Meta-Analysis of Teams Games Tournament Learning Model on Mathematics Learning Outcomes

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Abstrak

Penelitian ini bertujuan untuk menganalisis penggunaan model Teams Games Tournament dalam meningkatkan hasil belajar matematika siswa SD. Penelitian ini menggunakan metode meta analisis. Penelitian ini dilakukan dengan cara merumuskan masalah penelitian, menelusuri hasil penelitian relevan untuk dianalisis. Pengumpulan data dilakukan dengan menelusuri jurnal online menggunakan Google Cendekia. Hasil penelusuran memperoleh 10 artikel sumber data penelitian. Analisis yang dilakukan menggunakan metode perbandingan untuk mengetahui dampak penerapan model pembelajaran Teams Games Tournament dalam meningkatkan hasil belajar matematika. Berdasarkan hasil analisis model Teams Games Tournament mampu meningkatkan hasil belajar matematika siswa mulai dari yang terendah 16,8% sampai pada nilai tertinggi 102,9% dengan rata-rata 32,59%. Jadi, model TGT berdampak positif terhadap hasil belajar siswa Sekolah dasar.

Kata Kunci: Teams Games Tournament, Hasil Belajar

Abstract

This study aims to analyze the use of the teams games tournament model in improving the math learning outcomes of elementary school students. This research uses the meta-analysis method. This research was conducted by formulating research problems, tracing relevant research results for analysis. Data collection is done by searching for online journals using Google Scholar. Search results obtained 10 articles of research data sources. The analysis used a comparison method to determine the impact of implementing the Teams Games Tournament learning model in improving math learning outcomes. Based on the analysis results of the Teams Games Tournament model was able to improve students' math learning results ranging from the lowest 16.8% to the highest score of 102.9% with an average of 32.59%. So, the TGT model has a positive impact on the learning outcomes of elementary school students.

Keywords: Teams Games Tournament, Learning Outcomes

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Introduction

Mathematics is a subject that has an important role in education. Mathematics is a compulsory subject that needs to be mastered by every level of education, both Elementary School (SD) and Junior High School and Senior High School (Degita et al., 2019; Rahmawati et al., 2019). Mathematics has an important role in shaping and developing logical, systematic, and critical thinking skills (Sulistiani & Masrukan, 2016). Mastery of Mathematics for students will support success in other subjects. Learning mathematics is not only looking for value after the learning process takes place, but students can accept the material being taught and apply it in real life (Hidayah et al., 2019). Given the importance of mathematics, the learning process carried out must be learning that focuses all learning

processes on students (Dirgantoro, 2018). To realize this learning, teachers are required to design quality learning as well. One thing that teachers can do is to choose a learning model that is following the material and characteristics of the child. The learning model applied is expected to be able to make mathematics learning more meaningful, fun, students become more active in the learning process and students do not just memorize formulas and sample questions or remember facts but students must experience for themselves what they are learning (Ayuwanti, 2017; Rahmawati et al., 2019). With the appropriate model, it can make maths lessons more enjoyable and there is no more fear of students learning mathematics.

However, reality does not always live up to expectations where until now mathematics is still a scary lesson and it is not uncommon for students to avoid learning mathematics. Students' critical thinking skills in mathematics are still lacking, the lack of critical thinking skills in mathematics has something to do with the learning methods used by the teacher (Nuriani, 2014). Low student learning outcomes in mathematics learning are not solely due to difficult material, but can also be caused by the learning process being carried out (Achmad Achmad & Irmansyah, 2011). Students getting grades below the KKM are learning that more often only transfers information about material and sample questions from the teacher to students so that students only receive what the teacher gives without knowing clearly how it applies to a problem or question (Sam & Qohar, 2016). So, most of the causes of the failure of the mathematics learning process are the inaccurate use of learning models that are not following the characteristics and material being studied. One model that is often used is the Teams Games Tournament (TGT) learning model.

The Teams Games Tournament model is a cooperative that places students in heterogeneous study groups of 5 to 6 students so that students can help each other in solving problems given (Laila & Rahmat, 2018; Nurmahmidah, 2017; Susanna, 2018). The TGT model is easy to apply, involves the activities of all students without having any difference in status, involves the role of students as peer tutors, and contains elements of play and reinforcement (AP & Amir, 2018; Gunawan, 2019; Yudianto et al., 2014). The TGT model allows students to learn to be more relaxed in addition to fostering responsibility, cooperation, healthy competition, and learning involvement (Rosdiani et al., 2013). The TGT model makes the learning process more fun and in a happy atmosphere and creates team competition based on the responsibility of each individual because it consists of games that are following the character of the child (Drayatun & Rahmawati, 2017). So based on these opinions the TGT learning model has a positive impact on learning. This is also evidenced by the results of previous research.

Research conducted by Sholeh et al., (2019) The results of this study indicate that (1) lecturers in planning drama learning with the jack-based TGT strategy, have followed the syllabus made, the objectives are following the SK and KD used. Then the syllabus of learning steps is complete starting from the initial activities which cover perception, elaboration, confirmation, and motivation. The core activities include exploration, elaboration, and confirmation, then closing. (2) The application of drama learning with jack-based TGT in the assessment technique on the syllabus is stated as "practice/performance tests" but the lecturer is more concerned with written tests when giving student assignments, there are also several indicator points that have not been able to be achieved by students and do not get special attention lecturer. Research conducted by Suaeb et al., (2018) showed that the results of the study for two cycles showed that the implementation of the Teams Games Tournament (TGT) model of cooperative learning assisted by image guessing media can improve the social studies learning outcomes of class students. Research conducted by Syarani (2019) shows that there is a difference in the average learning outcomes of students for the posttest experimental class and the control class posttest. It can be concluded that the use of the TGT (Teams Games Tournaments) type of cooperative learning model is proven to

be effective with a significant difference between the average learning outcomes between the experimental class and the control class.

The studies that have been done prove that the Teams Games Tournaments model has a very positive impact on the learning process, both from increasing interest, motivation, activities, and student learning outcomes. However, in more detail, there is no further research that examines how the Teams Games Tournaments model impacts learning outcomes. Therefore, it is formulated a research objective to analyze the use of the Teams Games Tournament model in improving elementary students' mathematics learning outcomes. This research was conducted using a meta-analysis method.

Materials and Methods

This research is a type of meta-analysis research, namely research conducted by summarizing, reviewing, and analysing research data from several previous research results. This meta-analysis research uses a sample of 10 articles in national journals about the use of the Teams Games Tournament model in improving elementary students' mathematics learning outcomes. The distribution of the 10 articles of research subjects can be seen in the groups in Table 1 below.

Table 1. Articles in national journals about the use of the Teams Games Tournament model in improving elementary students' mathematics learning outcomes

Information	Grade	Content
Title 1	4	Mathematics
Title 2	3	Mathematics
Title 3	5	Mathematics
Title 4	5	Mathematics
Title 5	4	Mathematics
Title 6	5	Mathematics
Title 7	5	Mathematics
Title 8	4	Mathematics
Title 9	2	Mathematics
Title 10	4	Mathematics
Total	10	10

Data collection in this research uses literature study techniques by conducting studies on articles related to the research topic. Data collection begins with finding and collecting relevant articles according to topics to be discussed in various journals that have been accredited by Sinta with search keywords, namely the effect of guided inquiry learning models on learning outcomes of elementary school students. From these various journals, the researchers found sixteen articles related to the theme to be studied, but only seven articles met the criteria. The data analysis in this study used a meta-analysis technique of the effect size (ES). With the following formula. The formula is:

$$\Delta = \frac{\bar{x} \text{ experiment} - \bar{x} \text{ control}}{SD \text{ control}} \tag{1}$$

With the following effect size criteria:
effect size ≤ 0,15 efek yang dapat diabaikan
 0,15 < *effect size* ≤ 0,40 efek kecil
 0,40 < *effect size* ≤ 0,75 efek sedang

0,75 < *effect size* ≤ 1.10 efek tinggi
 1,10 *effect size* ≤ 1,45 efek yang sangat tinggi
 1,45 < *effect size* pengaruh yang tinggi

Results and Discussion

The results obtained 10 articles related to the Teams Games Tournament approach to improve the critical thinking skills of elementary school students. The article data was processed by summarizing and including the essence of the Teams Games Tournament research results. Then the data is reported back through descriptive qualitative and quantitative. The data from the analysis of the Teams Games Tournament approach are described in Table 2 below.

Table 2. Results of the Analysis of the Teams Games Tournament Approach to Mathematics Learning Outcomes

No.	Topic	Improved Learning Outcomes			
		<i>Pre-test</i>	<i>Post-test</i>	Gain	Gain %
1	X1	33.00	66.97	33.97	102.9
2	X2	70.50	90.10	19.6	27.8
3	X3	39.11	45.70	6.59	16.8
4	X4	60.09	72.65	12.56	20.9
5	X5	53.35	65.80	12.45	23.3
6	X6	62.67	83.33	20.66	32.9
7	X7	56.60	66.43	9.83	17.4
8	X8	64.14	76.00	11.86	18.4
9	X9	55.45	75.70	20.25	36.5
10	X10	65.40	84.32	18.92	29.0
Average		56.031	72.70	16.671	32.59

Based on Table 2, shows that the Teams Games Tournament learning model is very effective for use by elementary school students. This can be seen from the increase in mathematics learning outcomes from low to highest scores, which are 16.8% and 102.9% with an average of 32.59%. The average result of learning mathematics before using the Teams Games Tournament 56,031 increased after using the Teams Games Tournament to 72.70. The average before and after using the Teams Games Tournament model increased by 32.59%. This can be shown based on the results of different test analysis. The results of the Output Paired Sample T-Test are presented in tables 3, 4, and 5 below.

Table 3. Paired Samples Statistic

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE-TEST	55.7000	10	11.64331	3.68194
	POST TEST	72.3000	10	12.70214	4.01677

Table 3 shows that using the Teams Games Tournament model was able to improve elementary students' mathematics learning outcomes from an average of 56,031 to 72.70.

Table 4. Paired Samples Correlations

Tabel 4 menunjukkan adanya relasi antara nilai rata-rata matematika siswa sebelum dan sesudah menggunakan model *Teams Games Tournament*.

		N	Correlation	Sig.
Pair 1	Pre-Test & Post Test	10	0.790	0.007

Table 5. Paired Samples Test

		Paired Differences				T	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pre-Test	Post Test	-1.660E1	7.96102	2.51749	-22.29497	10.905036.594	9	0.000	

The results of hypothesis testing, which are shown in table 5, show that H_0 = there is no significant difference in students' mathematics before using the Teams Games Tournament model and H_1 = there is a significant difference in student mathematics learning outcomes before and after collateralizing the Teams Games Tournament model. From table 4, it can be seen that the value of Sig (2-tailed) $(0.00) 0 < (0.05)$ and the value of $t = -6.594 < t$ table 1.812, so H_0 is rejected. So, it can be concluded that there are significant differences in students' mathematics learning outcomes before using the Teams Games Tournament model and after using the Teams Games Tournament model. Based on the results of the analysis that has been done, it can be seen that the use of the Teams Games Tournament model from each study can improve elementary students' mathematics learning outcomes. The increase in learning outcomes in each study has different percentages. This is influenced by several factors, both internal and external factors. Internal factors, namely factors that come from within the individual, such as ways of thinking, knowledge, talents, interests, and so on. Student external factors are factors that come from outside, for example, the school environment, family, school conditions, time, school location, and research subjects.

The Teams Games Tournament model is a cooperative that places students in heterogeneous study groups of 5 to 6 students so that students can help each other in solving problems given (Laila & Rahmat, 2018; Nurmahmidah, 2017; Susanna, 2018). The TGT model is easy to apply, involves the activities of all students without having any differences in status, involves the role of students as peer tutors, and contains elements of play and reinforcement (AP & Amir, 2018; Yudianto et al., 2014). The TGT model allows students to learn to be more relaxed in addition to fostering responsibility, cooperation, healthy competition, and learning involvement (Rosdiani et al., 2013). The TGT model makes the learning process more fun and in a happy atmosphere and creates team competition based on the responsibility of each individual because it consists of games that are following the character of the child (Drayatun & Rahmawati, 2017). The Teams Game Tournament (TGT) has the potential to improve the collaborative skills of students in learning because the TGT learning model is a learning model that is carried out in groups and is a learning model that uses a communicative approach, where an approach allows students to be actively involved

(Teladaningsih et al., 2019). So, based on these opinions the TGT learning model has a positive impact on learning. This is also evidenced by the results of previous research.

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Conclusion

Based on the results of the analysis, it can be concluded that using the Teams Games Tournament (TGT) learning model can improve the mathematics learning outcomes of elementary school students, it can be seen from the lowest score of 16.8% to the highest 102.9% with an average of 32.59%. The increase in learning outcomes in each study has different percentages. This is influenced by several factors, both internal and external factors. Internal factors, namely factors that come from within the individual, such as ways of thinking, knowledge, talents, interests, and so on. Student external factors are factors that come from outside, for example, the school environment, family, school conditions, time, school location, and research subjects.

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