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A Meta-Analysis of The Effect Teams Games Tournament (TGT) in Biology Learning Toward Student Learning Outcomes

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ABSTRACT

Learning is a complex process which contains several aspects. These aspects are an increase in the amount of knowledge, the ability to remember and reproduce, there is an application of knowledge, inferring meaning, interpreting and relating to reality, and a change as a person. This research is hoped that can give contribute for schools, teachers, and students. This researcher has led a review entitled Meta-examination of the impact of the Teams Games Tournament (TGT) learning model on science subjects on student learning outcomes using the connection test technique the Team Games Tournament (TGT) Learning Model on Student Learning Outcomes in Science Learning. is a scalable method for consolidating the consequences of at least two comparable examinations to obtain a mix of quantitative information. This research plans to determine student learning outcomes in science learning after the Team Games Tournament (TGT) learning model is applied. This research is uses the strategy of Meta Correlation Analysis which is an attempt to summarize various exploratory results quantitatively based on the consequences of important investigations. In this research is can find that there is an impact from the use of the learning model the fun type is Teams Games Tournament Tournament assisted by general media on student learning outcomes. Utilization of Cooperative Learning Model Types of Teams Games Tournament Assisted by Audio Visual has an impact on student learning outcomes. Likewise, TGT can also train self-confidence and all students are given the opportunity to attend classes effectively. Opening the door for students to be interested can make students more dynamic and increase their knowledge.

KEYWORDS

Meta Analysis,
TGT,
Biology Learning

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1. Introduction

The progress of social media and state life must be seen from increased training. The school is only an organization and work to foster the state and the personality of the state. In general, schooling is an impact, a direction, a bearing for development, is free and has a total and mature character. (Pramita Arif, 2018).

Training is a conscious and organized work to create a climate of learning and educational experience with the aim that students effectively develop their ability to have strict otherworldly powers, wisdom, character, knowledge, respectable people, and the necessary abilities without the help of others, society state and state. Regulation no. 20 of 2003 article 1 concerning the school system). Furthermore, schools are one of the important things to determine the progress of a country, so to deliver human resources as subjects in many events, capital is needed from the consequences of the training itself (Hakim, 2013).

With the ultimate goal of working on the nature of the training, the nature of the instructor is one part that plays a vital role. In completing their abilities, educators cannot be separated from learning exercises.

According to Suardi (2018), learning is a collaborative process between students and teachers and learning assets in a learning climate. In this communication cycle there is an exchange of information and values from educators to students, including from climate to students. A good relationship between educators and students will give positive results or influence in the process being pursued and vice versa, if the collaboration is not going well, the results obtained will also not be optimal. In learning, the educational experience is complete. Learning is the development of mental and proactive tasks to get behavioral adjustments due to the encounter of individuals in communicating with their current situation including mental, emotional and psychomotor (Parnawi, 2019).

In addition, Widarta (2020) Learning is a change in behavior that lasts a long time and may occur due to training and support in order to achieve certain goals. This assessment actually advances the course of the association in learning either with different people or with different conditions. As the last lesson, learning outcomes will be obtained which are the result of communication between students or students with different educators or students including climate. Thus, educators are expected to take advantage of models that change addresses, but also different models, such as learning models that promote dynamic, imaginative, powerful and fun learning. The determination of the learning model greatly affects student learning outcomes. Furthermore, we need a learning model that can apply students in education and educational experience to be more tolerant and feel more confident in their capacities which are solved by group work. The TGT (Team Games Tournament) model is a type or learning model that is not difficult to implement, includes exercises for all students without the need to distinguish status, contains games and support (Rosdiani, 2014).

Students complete the learning exercise, specifically paying attention, getting clarification on some pressing issues, collecting data, partnering, and conveying what they find from the learning exercise. In science subjects, especially science, students are expected to have the ability to process science in completing student focus mastery exercises. Science process skills encourage students to track reality and information ideas for themselves. Science process abilities must be created because they contain mental abilities along with scientific and interactive abilities. In developing experiences, instructors work with students to find problems, direct conversations, deal with problems and engage effectively during evolving experiences (Zulfaidhah, Palenewen, & Hardoko, 2018).

Learning is a complex process which contains several aspects. These aspects are an increase in the amount of knowledge, the ability to remember and reproduce, there is an application of knowledge, inferring meaning, interpreting and relating to reality, and a change as a person. (Eveline Siregar & Hartini Nara, 2010). When there is a learning process, there is also a teaching process. This would be easy to understand, because if someone is learning, of course someone will teach it, and vice versa if someone is teaching someone will learn. From this teaching and learning process will be obtained a result, which is generally called learning outcomes. But in order to obtain optimal results, the teaching and learning process must be carried out consciously and intentionally and well organized (Sardiman, AM, 2011).

Learning can be said as a cycle, which is intended so that in realizing the existence of a process of seeing, making, paying attention, overcoming problems or problems, tuning, and training. Therefore, in the educational experience, educators must have the option of directing and working with students in order for students to complete this cycle. The experience that develops must really be sought so that there is an adjustment in student behavior brought about by this cycle. In this way, one can be considered learning because there are indications of cyclical purposefully and creating changes in student behavior that are acquired with respect to climate. An example of behavior change from learning outcomes is increasing student capacity in accordance with the goals that have been set. This progress is recognized as change, rather durable, consistent, and useful. Experience that develops will create learning outcomes. But keep in mind, even though the learning objectives are clear and directed, the learning outcomes obtained are not ideal. Because good results are influenced by different parts, and especially how students practice as learning subjects. (Sri Anitah W, et al, 2007)

Meta-examination is a scalable method for consolidating the consequences of at least 2 comparable examinations to obtain a mix of quantitative information. It is currently the most commonly used meta-examination for clinical introduction. This is justified, arguing that the clinical introduction is more normalized in the plan and provides the most basic evidence of a causal relationship. Meta-examinations can also be performed in a variety of observational studies, but would welcome more problems in both the strategy and the measures used, because of the tendency to be riskier in the observational examination than in the clinical setting. Judging from the cycle, meta-examination is an observational review, as in a specialist making a restatement of reality without exercising exploratory control. (Egger M, Smith GD, 1997)

Based on the description that has been made, the researcher has led a review entitled Meta-examination of the impact of the Teams Games Tournament (TGT) learning model on science subjects on student learning outcomes using the connection test technique. The Team Games Tournament (TGT) Learning Model on Student Learning Outcomes in Science Learning.

This study plans to determine student learning outcomes in science learning after the Team Games Tournament (TGT) learning model is applied. The benefits of this exam are expected to provide benefits for several individuals who are closely involved, especially for students to further develop learning outcomes in science learning, for educators to better utilize the learning model that will be used. Meanwhile, for schools, it is appropriate information and commitment for schools with the aim of further developing student learning outcomes in the implementation of learning through learning models.

2. Method

Recorded as a hard copy of this logical article as a written survey, the specialist uses the strategy of Meta Correlation Analysis which is an attempt to summarize various exploratory results quantitatively based on the consequences of important investigations.

Meta-examination is a factual method as a combination of at least two comparable investigations in order to obtain a combination of quantitative information. Meta-checks are also quantitative because their estimates use numbers and measures designed to handle data from multiple sources of information. The stages in this examination are adjusted to the means of making a meta-investigation proposed by Glass with the following stages.

The first stage is preparation stage. At this stage, a domain will be assigned based on independent variable include learning Team Games Tournament (TGT) and dependent variable include student biology learning outcomes. And then, at this stage will define the research criteria summarized includes form of publication is from articles form online journals, publication year is in 2011-2022, the operating definition of the dependent variable is learning outcomes are test result obtained by student.

The next stages is implementation stage. This search and collect research was be held on June 15, 2021 – June 20, 2021. The research variable is research identity article, the target variable is level of school consisting of high school. This implementation stage will calculating effect size per study, analyzing the relationship between variables, and making summary in the form of a scientific report.

In this research, the data will be analyzing of the effect size based on target variable. The data will be analyzing of the effect size of other moderator variables found, such as the type of team games tournament (TGT) used. Then, analyzing of the relationship between the variables. The variables are The school level with the team games tournament (TGT) and learning model The material used in the team games tournament (TGT) learning model. Schematic of the correlation meta-analysis method can be seen in Figure 1.

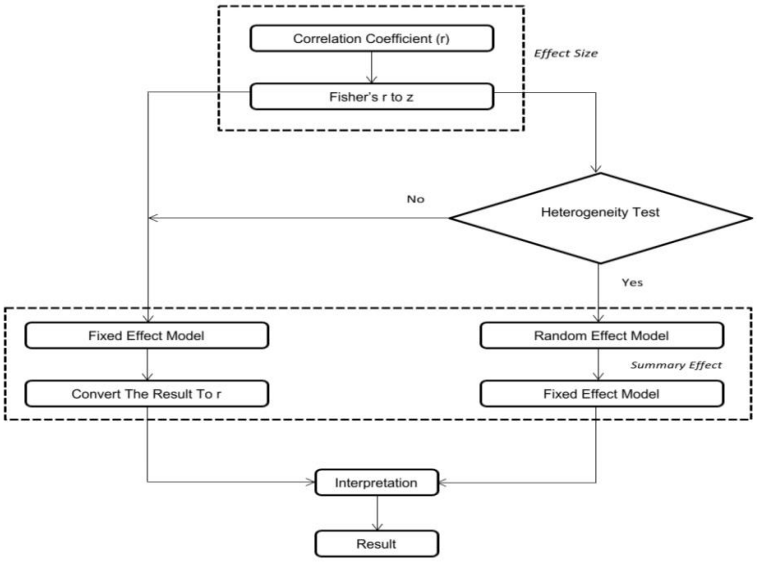

Figure 1. Schematic of the Correlation Meta-Analysis method.
Image from Retnawati, Heri et al, Introduction to Meta Analysis, (Yogyakarta: Parama Publishing, 2018)

3. Results and Discussion

Meta-analysis is a statistical technique in the form of a combination of two or more similar studies in order to obtain a mixture of quantitative data. Meta-analysis is also quantitative because its calculations use numbers and statistics that aim to process information from many data sources. From the search that has been carried out, it was found 10 article titles that are relevant to the article criteria that will be used in this study. The criteria that must be met by the articles to be selected are (1) Loading the team games tournament (TGT) learning model variables as independent variables and student learning outcomes as independent variables; (2) Contains statistical information that will be used to calculate Effect Size, such as F, t, and r values. There are some previous research that has been carried out to be used as a reference in this research (Table 1).

Table 1. List of Articles Used

Article Code	*Title*	*Journal Name*	*Researcher*
A1	The Effect of the Application of Cooperative Learning Model Types of Teams Games Tournament (TGT) on Biology Learning Outcomes on Biodiversity Materials at SMA Negeri 1 Batang Hari	Biodik: Biology Education Scientific Journal Vol.5 (3), 2019	Vinanda Zulfira, Evita Anggereini and Ali Sadikin
A2	Improving Student Biology Learning Outcomes through the Application of the Teams Games Tournament (TGT) Cooperative Learning Model	Journal of Binomials Vol. 1 (1), year 2018	WiwinPramitaArif
A3	Improving Student Learning Outcomes on the Subjects of the Coordination System Using the TGT Type Cooperative Learning Model in Class XI Science High School	Bioed: Journal of Biology Education Vol 9 (1), 2021	Rika Rachmayanti
A4	The Influence of the Teams Games Tournament (TGT) Learning Model Using Crossword Puzzles (TTS) on Student Learning Outcomes XI IPA SMA Muhammadiyah Batam	Bio-Lectura: Journal of Biological Education, Vol 9 (1), 2022	Nurhaty Purnama Sari, Sahika Della, Fenny Agustina
A5	The Effect of Cooperative Learning Types of Teams Games Tournament Assisted Audio	Binomial Journal Vol 3 (2), year 2020	St. Nurhalisah

	Visual on Learning Outcomes of Class XI Science Students		
A6	Application of the Teams Games Tournament (TGT) Learning Model on Student Motivation and Learning Outcomes on Animal World Material Class X at SMA Negeri 8 Palembang	Journal of Learning Biology, Vol 5 (1), 2018	Msy Hikmah, Yenny Anwar, and Riyanto
A7	Teams Games Tournament in Improving Student Learning Outcomes	Journal of Biology Science & Education vol 2 (2), 2013	Hajrawati
A8	The Effectiveness of the Cooperative Learning Model Type of Teams Games Tournament (TGT) with a Scientific Approach to Biology Learning Activities and Outcomes Class XI SMA/MA	Proceedings of the National Seminar on Biology VI. Harmonization of Biology Learning in the Revolutionary Era 4.0	Siti Harianti Asnur, Yusminah Hala, A. Asmawati Azis
A9	Application of the TGT (Teams Games Tournament) Learning Model to Increase Learning Motivation	Indonesian Journal of Educational Development Vol 2 (2), year 2021	Ngurah Yuliawati's son
A10	Application of Teams Games Tournament (TGT) through Domino Card Media on Material Oil for Class XI MAN 4 Aceh Besar Students	Lanthanide Journal, Vol. 5 (2), 2017	Susanna

Teams-Games Tournament (TGT) as a new method, not many people know about it or even implement it. The Team Games Tournament (TGT) learning method has many benefits, including as an alternative to creating varied conditions in teaching and learning activities, it can help teachers solve problems in learning, such as low student interest in learning, low student learning activities or low students. learning outcomes and involve the activities of all students without having to have differences in status, also involving students' roles as "peer tutors" (2009).

Learning models such as TGT (Teams-Games-Tournament) can build inspiration and learning outcomes because in TGT learning students not only recognize what is given by the teacher, but all students effectively take part in developing experiences, specifically through conversations and games. . This can build excellence and inspire students to take science illustrations. Students also do not feel tired because in delivering teacher learning is not boring, but there are variations.

In the diary entitled Application of the Team Games Tournament (TGT) Learning Model on Student Motivation and Learning Outcomes in Class X Animal World Materials at SMA Unggul Negeri 8 Palembang, this diary has the consequence of a typical learning inspiration poll for students in class X. exploration class and control class. Average Exploration 80.39 Control 67.50 . Table 4 shows the side effects of the typical inspirational poll for the experimental class and the control class. Typical learning inspiration in the exploratory class got a higher score than the class, which was 80.39 and learning inspiration in the control class was 67.24. This is because there are still many control class students who often make a fuss when there is an increase in experience. This marker is because the test class students really like to advance by using the TGT learning model, so they are very dynamic when learning. Judging from the description above, it is very clear that the trial class has great learning inspiration by applying the TGT type of fun learning model.

The consequence of testing this speculation test shows that the value of tcount > t table is 9.590 > 2,000 so that Ho is rejected and Ha is recognized. This shows that the useful learning model of the TGT (Team Games Tournament) type fundamentally influences students' learning inspiration in the material world of creatures at SMA Unggul Negeri 8 Palembang. This is because by applying the TGT learning model, students can be effectively linked to the educational experience.

In the Diary entitled The Effect of Cooperative Learning Types of Audio Visual Assisted Game Tournaments on the Learning Outcomes of Class XI Science Students. The result of this review describes student learning outcomes when given treatment as a useful learning model type Teams Games Tournament Assisted Audio Visual on Outcomes Learning Biology Students on Human Reproductive System Material in a trial class. Distribution of statistical scores of learning outcomes of pre-test and post-test biology can be seen in Table 2.

Table 2. Distribution of Statistical Scores of Learning Outcomes of Pre-Test and Post-Test Biology Class XI Science at SMA Negeri 20 Pangkep

Statistical Value Categoris	*Pre-Test*	*Post-Test*
Highest rate	90	95
Lowest rate	20	45
Mean	53, 4375	73,4375
Median	50	75
Range	75	50
Standard Deviation	15,42084	10,58281
Variance	237, 8024	111,996

Source : Processed form data SPSS 25

The results of the hypothesis test using the independent sample t-test in the SPSS program can be seen in Table 3 as follows:

Table 3. Hypothesis Testing

Paired Sample Test				
		Paired Differences		
		t	df	Sig. (2-tailed)
Pair 1	Learning outcomes students-grade	29,396	63	000

Viewed from Table 3 shows the t table value of 1.998341 and t count of 29.396 where t table < t arithmetic so that based on the testing steps for testing speculation, it is stated that Ho is rejected so that H1 is recognized which means that there is an impact from the use of the learning model the fun type is Teams Games Tournament Tournament assisted by general media on student learning outcomes. Utilization of Cooperative Learning Model Types of Teams Games Tournament Assisted by Audio Visual has an impact on student learning outcomes. This impact must be seen from the typical test results of student learning outcomes through a basic test before students are given treatment (Pre-Test) and the last test after students are given treatment (Post-Test), where the student's score on the Pre-Test is 53.43 then the normal value increased to 73.43 on the Post-Test.

In the diary entitled the influence of the implementation of the Teams Games Tournament (TGT) cooperative learning model on biology learning outcomes on biodiversity materials at SMA Negeri 1 Batang Hari, this diary has results (Table 4) ordinary class 84.90. The control class with regular learning (conversational techniques) on the material on Biodiversity got a normal grade of 82.35. Distribution of Student's Pre-Test Results

Table 4. Distribution of Student's Pre-Test Results

Grade	*Number of Students*	*Average*
Experiment	32	84.90
Control	34	82.35

Table 5. Distribution of Student's Post-Test Results

Grade	*Number of Students*	*Average*
Experiment	32	85.75
Control	34	82.64

From the information (Table 5) due to the evaluation of students' emotional perspectives, it tends to be seen that in the exploratory class that has been treated to the TGT learning model in a logical way to handle Biodiversity material, the typical grade value = 85.75 with a very good assessment. The control class with customary learning (conversational strategy) on the material on Biodiversity got a typical score = 84.64 with a decent score.

The consequence value of the emotional evaluation survey above is the combined value of the self-evaluation score and the peer rating. In this review, the examination needs test is supplemented with regularity test and homogeneity test to decide whether the information being tested is usually scattered or not. Judging from the results of the regularity test estimation, the calculated L value for the test class

is 0.019, while the L table with n 33 at the 0.05 level is 0.173. Because Lcount < L table, this indicates that the posttest result information for exploratory class students regularly corresponds to the original 95% level, while for the control class the value of L count = 0.061 and L table with n = 33 at 0.05 the level is 0.154. Due to the reason that Lcount < L table, the control class is also usually adjusted. The homogeneity test in this review uses the F-test.

Mental learning outcomes are obtained as the purpose of the questions given to students after learning occurs (posttest). The questions used were tested for legitimacy, immovable quality, difficulty level and strength of recognition. Based on the posttest results, it was found that the science learning outcomes of class X MIA SMA Negeri 1 Batang Hari on Biodiversity material, where for the exploration class the learning outcomes were then completed or the final results. from the last test posttest) obtained normal. The control class for the test results after the learning was completed got a normal score of .

The results obtained were then tested for the ordinary test and homogeneity test and then additionally tested using the t test. This further test uses a t-test, meaning that to test exploratory speculations, it is found that juggling numbers > t table is 1.8 > 1.667 so that H1 is recognized for posttest learning outcomes or after being handled using the TGT learning model (should be seen in Figure 4.1). However, the t-esteem test showed that mathematics > t table, then the normal learning outcomes of the exploration class and control class were unique. Research on the meta-analysis of the effectiveness of the learning model on students' thinking skills has been conducted and shows that the inductive learning model is effective in improving students' thinking skills (Nugroho, Wati, & Ramli, 2021)

Considering the three diaries stated that the use of the Team Games Tournament Learning Model in science subjects can further develop students' results and students can also gain from different students and exchange ideas for research before being introduced. before class. Apart from that, TGT can also work on courage and all students are offered the opportunity to attend classes effectively. Opening the door for students to be interested can make students more dynamic and increase their knowledge. The Teams Games Tournament

4. Conclusion

Judging from the consequences of the exploration that has been completed, it can be assumed that there is a meta-examination of the impact of the Teams Games Tournament (TGT) learning model on science subjects on student learning outcomes with 10 diary articles. stated that the use of the Team Games Tournament Learning Model in science subjects could further develop learning outcomes. Students and students can also get from different students and convey their thoughts to each other to be tested before being introduced in front of the class. Likewise, TGT can also train self-confidence and all students are given the opportunity to attend classes effectively. Opening the door for students to be interested can make students more dynamic and increase their knowledge.

This research has limitations, including that in this study it is not clearly explained about the advantages and disadvantages of implementing the Teams Games Tournament (TGT) learning model compared to other models. This research is hoped that can give contribute for schools, teachers, and students. For school, this research is hoped that can increase the effectiveness and efficiency of teaching and learning and improve school achievement through increasing learning achievement, students and teacher performa achievement. For students, this research is expected to overcome student difficulties in the learning process and improve student learning achievement. For teachers, this research is expected to provide an understanding that to improve Student learning achievement can be done through the TGT learning model and as a facilitator, teachers can use various methods and approaches in learning, one of which is to improve Student learning achievement can be done with the TGT learning model.

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