

Application of the Team Games Tournament (TGT) Model to Improve Biology Learning Outcomes at SMAN 1 Sultan Daulat

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Abstract

One of the obstacles in the learning process at SMAN 1 Sultan Daulat is that some students have low interest in learning. This is thought to be due to the lack of variations in learning models, so that the percentage of students who achieve the KKM score is only 65%. This research aims to determine the improvement in student learning outcomes by implementing the Team Games Tournament model. This research is quantitative research. The population in this study were all class XI students of SMAN 1 Sultan Daulat, totaling 46 students. The sample used was class XI Science 1. The data collection technique for the learning outcomes test was in the form of multiple choice. The data analysis technique was carried out quantitatively, namely by hypothesis testing and N-gain testing. The results of the research show that there is an increase in student learning outcomes based on the results of hypothesis testing with $t_{count} > t_{table}$, namely $18.25 > 2.074$ at a significance level of 5%. The increase in student learning outcomes can be seen from the average normalized N-gain result of 0.67 with the criteria for increasing learning outcomes being 67% in the medium category. Thus, the hypothesis in the research was accepted and it was concluded that there was a significant increase in student learning outcomes from implementing the Team Games Tournament model.

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INTRODUCTION

Knowledge in an education system is focused on the learning process carried out every day, both indoors and outdoors, both theory and practice. In educational units, of course, it cannot be separated from learning that has certain objectives in accordance with the national education system. To achieve national education goals, the government carries out changes to the curriculum, systems, infrastructure and other components aimed at achieving good quality education (Setiawan et al., 2021). Education has an important role in determining a person's level of productivity and therefore, the quality of education is the key to achieving individual success (Nuraini et al., 2023). In the world of education, there are many problems that arise in the learning process so that they often affect the teacher's learning model. The development of student learning can be obtained from teaching methods and learning activities in the classroom that can support student learning activities. One of the learning activities is a change in student behavior. To obtain good learning results, of course you must meet the facilities and infrastructure as well as high learning intentions. Therefore, varied teacher learning models are needed in a learning process to help students get satisfactory learning outcomes (Ulwiyah et al, 2018).

The learning model is a form of learning from planning (initial) to post-learning (final) which is specifically introduced by the teacher. It is also interpreted that the model is a wrapper or framework for implementing learning strategies, methods, approaches and techniques that are applied to the implementation of learning activities in the classroom (Asyafah, 2019). The learning

model also has an influence on learning outcomes where the learning outcomes are used as an ultimate guide to know how far students have gone in mastering the material that has been taught. This is in line with Komari's (2015) statement that learning outcomes are students' abilities obtained from learning activity processes or in combination with learning activities that have been programmed and controlled. In the process, Gulrul has already established the learning objectives first. Children who successfully achieve learning goals can be said to be truly successful in learning.

Based on the results of an interview conducted with one of the teachers who teaches biology class X1 at SMAN 1 Sultan Daulat. He said that one of the obstacles in the learning process was that some students had low interest in learning. This is thought to be due to the minimal variety of learning models used, therefore only a few students are active in the learning process. So the percentage of students who achieve the KKM score is only 65%. Meanwhile, according to Emelda, et al (2019), classical learning completion is declared successful if the percentage of students who complete it is 85% of the total number of students. With the problems expressed, efforts need to be made to overcome these problems. One thing that can be done is to apply various learning models that are appropriate to the teaching material, one of which is the Team Games Tournament (TGT) model.

TGT (Team Games Tournament) is a cooperative learning model that is easy to implement, involves students' original activities without any differences in status, involves students' role as peer tutors and contains elements of games and reinforcement (Shoimin, 2017). So this can influence students' enthusiasm and interest in learning as well as improve student learning outcomes. As stated by Satriawati (2019) in her journal, this Team Games Tournament (TGT) learning model can make students feel that they have received the ultimate attention and opportunity to express opinions, ideas, and are able to take responsibility for answering individual and group tasks and can also improve student learning motivation .

In the teaching and learning process, the learning outcomes that students are expected to achieve are important for teachers to know, so that they can plan teaching and learning activities appropriately. Learning outcomes must show a change in behavior or the acquisition of new behavior from students that is persistent, functional, positive and conscious. According to Bloom (in Rusmono 2017), learning outcomes are changes in behavior that cover three domains, namely the cognitive, affective and psychomotor domains. The cognitive domain consists of learning objectives related to knowledge and intellectual development and skills. The affective domain consists of learning goals that explain changes in attitudes, interests and values. Meanwhile, the psychomotor domain includes changes in behavior that show students have learned certain physical manipulative skills. The aim of this research is to find out whether there is an increase in student learning outcomes through implementing the Team Games Tournament (TGT) model at SMAN 1 Sultan Daulat and to find out whether there are any improvements in learning outcomes by implementing the learning process by implementing the Team Games Tournament (TGT) model at SMAN 1 Sultan Daulat. It is hoped that the research carried out will be useful in supporting students' interest in learning so as to improve student learning outcomes. Apart from that, it is also hoped that it will later be useful for teachers and the SMN 1 Daulat school as a new learning guide and a reference in the learning process, also useful for readers as knowledge new ones which can later be developed according to increasingly advanced educational developments.

RESEARCH METHODS

This research uses quantitative research with experimental methods and One-Group Pretest-Posttest research design. This research was conducted in class

The population in this study were all students in class XI Science at SMAN 1 Sultan Daulat, totaling 46 students consisting of 2 classes. Sample selection in this research was carried out using a purposive sampling technique, namely sampling was carried out based on certain considerations

which aimed to obtain samples that had the characteristics or characteristics that the researcher wanted or needed (Agustianti, 2022).

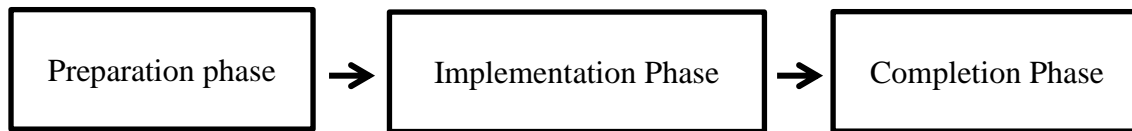


Figure 1. Research Procedure Chart

This research variable consists of independent variables (independent variables), namely the implementation of the Team Games Tournament (TGT) model and related variables (dependent variables), namely the learning results of class XI Science students at SMAN 1 Sultan Daullat. Data collection techniques include TELs instruments, namely the initial test (pretest) and final test (posttest) which aim to determine student learning outcomes. The learning outcomes test that is tested is in the form of multiple choice questions, totaling 20 questions. The data obtained are then processed using the following validity and reliability guidelines:

Formula of validity test: (Sulpriadi, 2021).

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{[N \sum x^2 - (\sum X)^2][N \sum y^2 - (\sum Y)^2]}}$$

Information :

- r_{xy} : Correlation coefficient between variable X and variable Y
- X : Answer score for each question item
- Y : Total answer
- $\sum XY$: The number of multiplications between variables X and Y
- $\sum X^2$: The sum of the squares of X values
- $\sum Y^2$: The sum of the squares of the Y values
- $(\sum X)^2$: The total value of X is then squared
- $(\sum Y)^2$: The total of the final Y values is squared
- N : Number of respondents

Reliability test formula: (Sulpriadi, 2021)

$$r_{11} = \left(\frac{k}{(k-1)} \right) \left(\frac{s_t^2 - \sum p_i q_i}{s_t^2} \right)$$

Information:

- k = number of items in the instrument
- p_i = the proportion of subjects who answered item 1
- q_i = 1- p_i
- s_t^2 = total variance

The data analysis technique in this research uses the normality test as a prerequisite for the hypothesis test and the N-gain test. formula of normality test uses Shapiro Wilk's test: (Cahyono, 2015)

$$T_3 = \frac{1}{D} \left[\sum_{i=1}^k a_i (X_{n-i+1} - X_i) \right]^2$$

Information :

- D = Based on the formula below
- a_i = Shapiro Wilk test coefficient
- X_{n-i+1} = The $n - i + 1$ st number in the data
- X_i = The i number in the data

$$D = \sum_{i=1}^n (X_i - \bar{X})^2$$

Information :

- X_i = The i number in the data
- \bar{X} = Average data

With certainty:

Hypothesis :

- H_0 : Samples with normal distribution
- H_a : The sample has abnormal distribution

According to the research criteria, namely if the value (p-value) $> \alpha = 0.05$ then H_0 is accepted; H_0 was rejected. And if the value (p-value) $< \alpha = 0.05$ then H_0 is rejected; H_a accepted.

To find out whether the Team Games Tournament (TGT) model can improve student learning outcomes, a t-test was carried out using Excel through a paired sample t-test. The hypothesis test (t-test) is carried out if the data is already normally distributed. Normality test using Excel via the Shapiro Wilk test. To find out how much student learning outcomes have increased, the N-gain test is used.

The hypothesis analysis method uses the paired sample t-test: (Nulryadi, 2017).

$$t_{hit} = \frac{\bar{D}}{\frac{SD}{\sqrt{n}}}$$

Where:

$$SD = \sqrt{var}$$

$$var (S^2) = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x} - \bar{D})^2$$

Information:

- t = calculated t value
- \bar{D} = the average difference between measurements 1 and 2
- SD = standard deviation of the difference between measurements 1 and 2
- n = number of samples

Under the condition:

- If $t_{hit} > t_{tab} \rightarrow$ is significantly different (H_0 is rejected)
- If $t_{hit} \leq t_{tab} \rightarrow$ is not significantly different (H_0 is accepted)

N-gain test formula: (Sulpriadi, 2021).

$$\text{Normalized Gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{ideal score} - \text{pretest score}}$$

The following is the Normalized N-gain classification:

Table 1. Classification of N-gain values

Mark	Classification
N-gain $\geq 0,7$	High
0,30 - 0,70	Moderate
00-0,29	Low

Furthermore, it is important to see that there is an increase in learning outcomes, whether high or low, which can be utilized with the following cultural strategies:

$$\text{Normalized Gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{ideal score} - \text{pretest score}} \times 100\%$$

The criteria used in classifying the improvement of learning outcomes in industrial development as a culture:

Table 2. Criteria for Improving Learning Outcomes

N-gain Test Percent Value	Classification
81%-100%	High
61%-80%	Moderate
41%-60%	Low
21%-40%	Very Low
10%-20%	No Upgrades

RESULTS AND DISCUSSION

Based on research results, the application of the Team Games Tournament (TGT) model in previous learning needs to begin with an initial test (pretest) which is used to measure students' initial abilities regarding the learning material to be studied. The following is a table related to the results obtained in the initial test (pretest) obtained by students. Based on research conducted at SMAN 1 Sultan Dulat, the following research data is presented (Table 3):

Table 3. Initial Test Student Learning Results (Pretest)

No.	Information	Pretest
1	The highest score	80
2	Lowest value	30
3	Number of students with a score ≥ 75	4
4	Number of students with a score ≤ 75	19
5	Average value	51,3

From the data in table 1 above, it shows that out of 23 only 4 students managed to get a score ≥ 75 and 19 students got a score ≤ 70 . The average score obtained was also only 51.3, while the classical completion percentage was still far from reaching 85%. So efforts need to be made to improve student learning outcomes in order to achieve the percentage of classical completeness by implementing learning models that are appropriate to the teaching material because learning models function as guidelines in the design and implementation of learning. This is in line with the opinion of Trianto (2016) who stated that the function of the learning model is as a guide for teaching designers and teachers in implementing learning. Therefore, the choice of model is greatly influenced by the nature of the material to be studied, the objectives (competencies) to be achieved

in the learning, and the level of students' abilities. The use of appropriate learning models can encourage the growth of students' enjoyment of lessons, foster and increase motivation in doing assignments, make it easier for students to understand lessons, thereby enabling students to achieve better learning outcomes, as we previously discussed together, the measure of teacher teaching success. The main issue lies in whether there is an increase in student learning outcomes (Abidin, 2019).

In this Team Games Tournament (TGT), students are formed into small groups consisting of five to six students who are heterogeneous, both in terms of academic achievement, gender, race and ethnicity. In TGT, academic tournaments are used, where students compete as representatives of their team against other team members who achieved similar results or achievements in the past (Shoimin, 2017). This TGT model instructs each member to be assigned to study the material first together with other members, then they are tested individually through academic games. The value they get from this game will determine the score of their respective groups (Huda, 2013).

The Team Games Tournament (TGT) model implemented in class

Table 4. Initial Test Student Learning Results (Pretest)

No.	Information	Posttest
1	The highest score	100
2	Lowest value	65
3	Number of students with a score ≥ 75	20
4	Number of students with a score ≤ 75	3
5	Average value	83,04

The table above shows an increase in the number of students who obtained a score ≥ 75 , from 4 students after the TGT model was implemented it increased to 20 students. Increased learning outcomes were obtained by testing hypotheses using paired sample t-test with the help of Microsoft Excel. This test is carried out by comparing the initial test scores (pretest) and final test scores (posttest) with the H_0 criterion being rejected if $t_{count} > t_{table}$ at the 5% significance level ($\alpha = 0.05$) and $df = N-1$. From the results of this t-test analysis, it shows that the value of $t_{count} > t_{table}$ is $18.25 > 2.074$ so that H_0 is rejected and H_a is accepted. This shows that the Team Games Tournament (TGT) model can improve biology learning outcomes at SMAN 1 Sultan Daulat. This is in line with research by Eka (2020), Sofyan (2022) and research by Rachma, et al (2019) which states that the Team Games Tournament (TGT) model can improve student learning outcomes. The magnitude of the increase in student learning outcomes can be seen in the table below.

Table 5. Average N-gain Value

	Pretest	Posttest
Mean	51,3	83,04
N-gain		0,67
Improved performance		67%
Category		Moderate

Table 5. above shows the results of N-Gain calculations from student learning test results data. The N-gain score test can be done by calculating the difference between the scores before and after learning (Latif, 2014). So we get an N-gain value of 0.67. If interpreted using the normalized gain classification, student learning outcomes are obtained in the medium classification, namely between 0.30-0.70. The N-gain value if interpreted using the criteria for increasing student learning outcomes in the form of percentages is in the medium classification between 61%-80%. So it can be concluded that the increase in student learning outcomes from the N-gain calculation is 67%.

This increase in learning outcomes is due to the provision of the Team Games Tournament (TGT) model by providing equal opportunities for all students to take part in the learning process. As stated by Shoimin (2017), the Team Games Tournament (TGT) model not only makes intelligent students (with high academic abilities) stand out more in learning, but students with low academic abilities also take part and have an important role in group, thus creating student motivation to learn because they respect each other among group members. Apart from that, TGT learning is also combined with cooperative learning which can help make differences into learning materials and not problems (Slavin, 2015).

When implementing the Team Games Tournament (TGT) model in the classroom, there was progress, namely increasing students' motivation and enthusiasm for learning as seen from their enthusiasm in listening to the material, their sense of togetherness during discussions and group learning, mutual respect for the answers given by their group mates during games. tournaments are held and students feel a sense of responsibility in mastering the material so they can compete during the tournament. According to Nasution (2018), the Team Games Tournament (TGT) learning model is group-based learning that can improve teacher and student interaction patterns. This is in line with Yudianto (2014) who states that this increase in learning outcomes occurs because in implementing the cooperative learning model students must be responsible. responsible for mastering the material in order to compete in academic tournaments. The obstacle faced when implementing this model is the use of my time which is quite long so that it can take up another teacher's lesson time.

Students' lack of interest in learning is due to low learning motivation so that good learning outcomes are not achieved. Apart from that, students' lack of interest in the learning process is also because students feel that they are not paid enough attention by the teacher so that students cannot contribute to learning. This is in line with the opinion of Indra (2017) who said that students' interest in learning is something that is important in the smooth teaching and learning process. Students who have high interest in learning in the learning process can support better learning outcomes, and vice versa, if students' interest in learning is low, the quality of learning will decrease and this will affect student learning outcomes. With this Team Games Tournament (TGT) model, all students without exception can participate in the learning process. Slameto (2013) also stated that interest in learning has a big influence on learning achievement.

Increasing learning outcomes by applying the Team Games Tournament (TGT) model in this research is in line with previous research by Satriawati (2019) which states that the Team Games Tournament (TGT) learning model can improve student learning outcomes because in this TGT model it can make students feel he/she gets attention and the opportunity to convey opinions, thoughts, ideas, questions and students can work independently or in groups and are able to take responsibility for individual and group tasks and can also increase students' learning motivation. The efficacy of this TGT learning model is because it is able to motivate students to be active in learning activities, so that student learning outcomes increase (Agustini, et al, 2014)

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that there is an increase in student learning outcomes by implementing the Team Games Tournament (TGT) learning model which can be seen from the hypothesis test with the obtained value of $t_{\text{count}} > t_{\text{table}}$, namely $18.25 > 2.074$ with the hypothesis conclusion being accepted that there is an increase in learning outcomes students through the application of the Team Games Tournament (TGT) model in reproductive system material in class XI IPA 1 at SMAN 1 Sultan Daulat. The magnitude of the increase in student learning outcomes after implementing the Team Games Tournament (TGT) model in reproductive system material in class medium category.

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