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COMPARISON OF STUDENT LEARNING OUTCOMES USING TEAMS GAMES TOURNAMENT (TGT) AND STUDENT TEAMS ACHIEVEMENT DIVISION (STAD) TYPES OF COOPERATIVE LEARNING MODEL

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ABSTRACT

This study aims to obtain related information; Comparison of student learning outcomes using cooperative learning models of teams games tournament (TGT) and student teams achievement division (STAD) models in Class XI IPA SMAN 1 Doloksanggul. This research is a type of quasi-experimental research. This research was conducted at SMAN 1 Doloksanggul, Humbang Hasundutan Regency, with a population of all students of class XI IPA at SMAN 1 Doloksanggul. Samples were taken by random sampling technique. The data collection method uses an instrument of learning outcomes consisting of pretest and posttest. The results of a comparative study of student learning outcomes using the cooperative learning model of teams games tournament (TGT) and student teams achievement division (STAD) models at SMAN 1 Doloksanggul are as follows: There is a comparison of posttest calculation results in experimental class I and experimental class II with Independent Sample T- The test gets the results of the Sig value. (2-tailed) 0.008 <0.05 then Ho is rejected and Ha is accepted or there is a significant comparison between the posttest average scores in the experimental class I (using the TGT learning model) and experiment II (using the STAD learning model). The TGT learning model is better used for student learning outcomes with an average of 86.14 than the STAD learning model with an average learning achievement score of 81.91.

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INTRODUCTION

Learning is a dynamic interaction between students and educators, forming the foundation of knowledge acquisition in any learning environment. Educators assist students in the process of acquiring knowledge (Meling, 2019). In simpler terms, learning is a means to help students grasp subjects effectively. Achieving positive learning outcomes depends on effective and engaging teaching methods, making the learning experience enjoyable for students (Muflihah, 2021).

To encourage active learning, students must choose suitable learning models that align with their study materials and individual needs. This motivation leads to a better understanding of the subject matter conveyed by educators, thus improving student learning outcomes. Trianto (2009) suggests that each learning model should align with specific learning objectives, materials, and students' characteristics and needs.

It is crucial for students to develop independent learning habits, relying less on teacher explanations and instructions. Students have the capacity to learn biology on their own and develop concepts based on their understanding of fundamental principles. However, many students struggle with identifying opposing concepts and formulating questions independently due to their reliance on teacher presentations (Lusia & Anastasia, 2021).

In the context of biology learning, several factors influence students' success, with the teacher playing a significant role. Teachers must create a directed and enjoyable learning atmosphere for all students, as an uninspiring environment can lead to less effective learning activities (Wahyuni, 2010). Teachers should act as facilitators, encouraging students to explore their interests, express ideas, and be creative within appropriate norms. The focus of teaching and learning should be on developing student engagement in the learning process.

Observations of biology classes at SMA N 1 Doloksanggul reveal that teachers primarily use the lecture method, resulting in passive learning where students only listen to explanations without active participation. Interviews with a biology teacher from the same school indicate that the circulatory system material is particularly challenging for students. The complexity of the material, the numerous scientific terms involved, and the lack of understanding hinder students' comprehension, leading to unsatisfactory learning outcomes, with only a few students scoring above the Minimum Completeness Criteria (KKM) of 75% (Sri, 2020).

To address these challenges and enhance student understanding, improvements in the learning process are necessary. One approach is to adopt an active learning model suitable for the class conditions to create a fun and effective classroom atmosphere. A recommended solution is to implement the cooperative learning models of Teams Game Tournament (TGT) and Student Teams Achievement Division (STAD).

According to Slavin (2005), the TGT model fosters cooperation through academic tournaments and quizzes, where students represent their teams and compete based on their academic performance. This model has proven to improve basic abilities, student achievements, positive interactions between peers, and self-confidence. Additionally, the STAD model, also proposed by Slavin (2010), is one of the simplest cooperative learning methods and is ideal for teachers new to the cooperative approach. By applying the TGT and STAD cooperative learning models, students are expected to show greater interest in the learning material, as lessons are delivered in a more engaging and enjoyable manner.

METHOD

This research was conducted at SMA N 1 Doloksanggul which is located in the Purba Dolok sub-district, Doloksanggul sub-district, Humbang Hasundutan Regency, North Sumatra. This research was conducted using a type of quantitative research, the type of quantitative research used in this study was experimental research or quasi-experimental with pretest and posttest. This study involved two different treatments. For experiment I, the cooperative learning model of the team games tournament type was applied, while for the experimental class II, the student teams achievement division learning model was applied. The population in this study were all students of class XI IPA SMA N 1 Doloksanggul consisting of 7 classes totaling 252 people. The samples in this study were two classes. The sample was taken by random sampling (random sample) meaning that all classes had the same opportunity to be sampled, namely the experimental class I, which consisted of 36 students, was taught using the Teams Games Tournament (TGT) learning model and the experimental class II, which consisted of 36 students. taught with the Student Teams Achievement Division (STAD) model, so that the

number of students who became the sample was 72 students. Data collection techniques in this study are using tests. Data analysis in this study is the Independent Sample T-Test.

RESULTS AND DISCUSSION

TGT Class Pretest and Posttest

Student learning outcomes were determined based on the posttest results administered at the end of the session. In classes where the TGT learning model was implemented, the average score obtained was 86.14 with a Standard Deviation (SD) of 7.009. The lowest learning achievement score in the TGT class was 73, achieved by 3 (three) students, while the highest learning outcome was 96, attained by 6 (six) students. These outcomes reflect the effectiveness of the TGT learning model in enhancing student learning achievements.

Student learning outcomes were assessed based on the posttest results administered at the end of the session. In classes where the STAD learning model was implemented, an average score of 81.91 was obtained, with a Standard Deviation (SD) of 5.972. The lowest learning achievement score in the STAD class was 70, achieved by 1 (one) student, while the highest learning outcome was 93, attained by 3 (three) students. The results of calculating student learning outcomes in Tables 4.1 and 4.2 indicate the average difference in student learning outcomes between the TGT model class and the STAD model class. A visual representation of the posttest scores of both classes is presented in Figure 1. This figure provides a summary of the students' performance in the TGT and STAD classes, showcasing the variation in learning outcomes between the two learning models.

The average posttest score for the TGT class was 86.14, surpassing the posttest score for the STAD class, which amounted to 81.91. The lowest posttest score in the TGT class was 73, whereas in the STAD class, it was 70. On the other hand, the highest posttest score achieved in the TGT class was 96, compared to 93 in the STAD class. The difference between the posttest scores of the TGT and STAD classes was 4.23. Prerequisite tests were conducted before testing the hypothesis using the t-test, encompassing the normality test and homogeneity test.

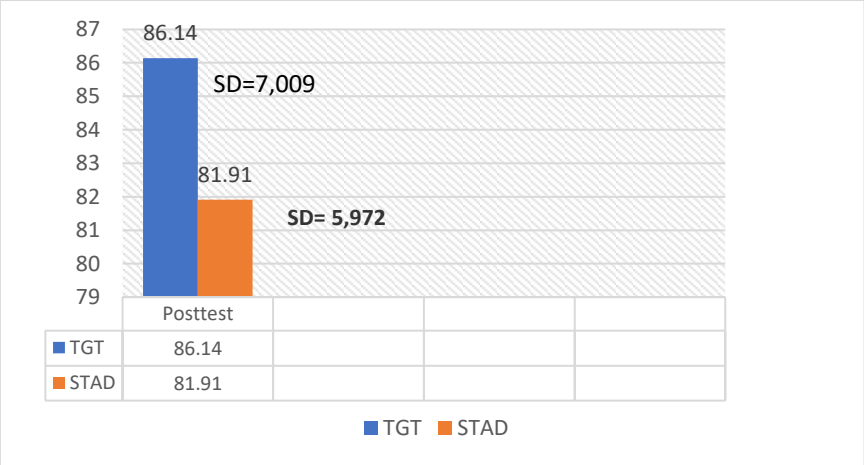

Figure 1. Comparison of Student Learning Outcomes in TGT Class and STAD Class

Table 1. Students' Learning Outcomes on Circulatory System

Test Type	Class	Mark	F	Average	Standard Deviation
Posttest	Kelas TGT	73	3	86,14	7,009
		76	2		
		80	3		
		83	5		
		86	9		
		90	4		
		93	3		
		96	6		
Posttest	Kelas STAD	70	1	81,91	5,972
		73	2		
		76	7		
		80	8		
		83	4		
		86	8		
		90	2		
		93	3		

Normality test

Normality test was carried out using the Lilliefors test using SPSS 25 with a significant level of $\alpha = 0.05$ and with the criterion that the data is normally distributed if $L_{count} < L_{table}$. The results of the normality test performed on both the pretest and posttest scores in the two treated classes, namely TGT and STAD are presented in table 2.

Table 2. Normality Test of Learning Outcomes in the TGT and STAD Class

Learning outcomes	Lilliefors Statistic	Df	Sig.
TGT model pretest	0,132	35	0,126
TGT model Posttest	0,137	35	0,096
STAD model Pretest	0.130	35	0,141
STAD model Posttest	0,140	35	0,080

Table 2 shows the normality results for the pretest TGT model with a significance value of 0.126 > 0.05 and the posttest TGT model with a significance value of 0.096 > 0.05. Whereas the normality results for the STAD model pretest with a significance value of 0.141 > 0.05 and the STAD model posttest with a significance value of 0.080 > 0.05. So, the pretest and posttest learning outcomes on the TGT and STAD models are normally distributed.

Homogeneity Test

Homogeneity test was conducted to test whether the sample came from a population with the same ability. The test used is the Levene test using SPSS 25. From the tests performed, the results are shown in table 3. Table 3 shows the results of the pretest homogeneity test with a significance value of 0.08 > 0.05 and posttest with a significance value of 0.589 > 0.05. Then the pretest and posttest come from populations with the same (homogeneous) variance.

Table 3. Homogeneity Test of Pretest and Posttest Learning Outcomes in the TGT and STAD

Learning outcomes	Levene Statistic	df1	df2	Sig.
Pretest	3,156	1	68	0,080
Posttest	0,295	1	68	0,589

Hypothesis test

Data on student learning outcomes that are normal and homogeneous can then be carried out to test the hypothesis to find out the differences in the treatment that has been carried out based on the calculated results using the statistical t test (Independent Sample T-Test) with the help of SPSS 25. Independent Sample T-Test t test to see whether there is a comparison of the mean values between two paired samples (experimental class I and experimental class II). Significance level (α) = 0.05, if Sig (2 tailed) < α, then Ho is rejected and Ha is accepted. Conversely, if Sig (2 tailed) > α, then Ha is rejected and Ho is accepted. The results of the t test (Independent Sample T-Test) can be seen in Table 4.

Table 4. Statistical results of the t test *(Independent Sample T Tes*)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Difference Means	Std difference . Error	95% Confidence Interval of Difference	
									Lower	On
Learning outcomes	Equal variances are assumed	0.295	0.589	2.717	68	0.008	4.229	1.557	1.123	7.335
	Equal variances are not assumed			2.717	66.3	0.008	4.229	1.557	1.121	7.336

Table 4 is obtained from the results of hypothesis testing with the Independent Sample T-Test using SPSS 25. The criteria for testing the hypothesis are comparing the Sig. (2- tailed) < or > 0.05. The results of the posttest calculations in the experimental class I and experimental class II with the Independent Sample T-Test obtained the Sig. (2-tailed) 0.008 <0.05 then Ho is rejected and Ha is accepted or there is a significant comparison between the posttest average scores in the experimental class I (using the TGT learning model) and experiment II (using the STAD learning model). The results obtained show that there is a comparison of student learning outcomes using the cooperative learning model of the types of team games tournament and student team achievement division in class XI IPA SMA N 1 Doloksanggul.

Table 5. N-Gain Test Results

Class	Pretest	Posttest	N-Gain	Category
TGT	61,71	86,14	0,72	High
STAD	55,69	81,91	0,57	Moderate

Based N-gain test, it is known that the achievement of increasing cognitive learning outcomes of students in the TGT class is maximally achieved with an N-Gain value of 0.72 in the high category. While the achievement of increasing cognitive learning outcomes in the STAD class was not optimally achieved with an N-Gain value of 0.57 in the moderate category. This shows that the use of the TGT type of cooperative learning model is more effective than the STAD type of cooperative learning model.

From the results of the research that has been done, it can be stated that students who are taught using the TGT model have higher learning outcomes than students who are taught using the STAD model. In table 4.1 it can be seen that the learning outcomes of students taught using the TGT learning model have an average value of 86.14. Meanwhile, students who were taught using the STAD learning model had an average score of 81.91. The lowest score in the TGT class was 73 with 3 students, and the highest score in the TGT class with a score of 96 was 6 students. Whereas in the STAD class the lowest score was 70 for 1 student and the highest score in the STAD class with a score of 93 for 3 students. Based on the KKM standard determined by the school, which is 74, classes taught using the TGT and STAD

models have an average score of complete learning outcomes, but have a comparison of the average learning outcomes between learning models using TGT and STAD. Kolin et al (2019) in her research suggested that there were differences in student learning outcomes taught using the TGT and STAD learning models. This was shown from the difference test using the t-test that had been carried out. The experimental class I using the TGT model has a higher average value than the experimental class II using the STAD model.

The difference in the value of the learning outcomes obtained by students is due to the learning carried out during 3 meetings in the class with the TGT model and the class with the STAD model. During learning that takes place in the classroom using the TGT model, teaching and learning activities are carried out through six phases of activity, namely problem orientation related to the circulatory system, formulating problems, making hypotheses, collecting data, processing data and drawing conclusions. In this case the students in the TGT class after finishing the group discussion, one representative from each group will answer the quiz questions with the help of their respective groups in answering the quiz so that the results of the quiz can be maximized. Whereas in the STAD class, after finishing group discussions, each student will answer the quiz questions given without help from friends or groups. Therefore, the learning outcomes in the TGT class are higher than the STAD model class. Hamdani & Wardani (2019) said that TGT is a type of cooperative learning where in a team games tournament students are divided into learning teams consisting of four people who differ in their level of ability, gender and ethnic background. Furthermore, the teacher will convey learning, students learn in class and ensure that all team members have mastered the subject matter. After that students play academic games with other team members to contribute score points to their team. Students play this game with three people at a table from representatives of each group. Meanwhile, in the STAD class, according to Rusman (2011), STAD is a generic method of classroom management and not a comprehensive teaching method for a particular subject, teachers use their own lessons and materials. This type of STAD cooperative model is easy to use for novice teachers because apart from being easy to understand, this learning model has students with high, medium and low abilities.

However, students who were given the TGT cooperative learning model were more motivated to be more active in the learning process than the STAD cooperative learning model. This was seen during group discussions in the TGT class, students divided tasks and shared responsibilities among group members so that each group member was more active and could deepen his understanding of the material being discussed. The TGT model really helps students to understand the circulatory system material because there is an incentive to win game tournaments through quizzes, so that each student tries to master the material before advancing to answer questions. And students in the TGT class are more enthusiastic in the learning process because of tournament games. Whereas in the STAD class it is also well applied in learning, it's just that not all students really work on practice questions, are less active in group discussions, this can be seen during discussions and quizzes, only smart students answer questions and quiz scores more often. TGT classes with high scores are dominated by clever students. This study supports Sharan's theory that students who learn using the cooperative learning model will have high motivation because they are encouraged and supported by their peers. Cooperative learning also results in increased academic abilities, improves critical thinking skills, forms friendships, draws various information and increases student motivation.

Based on the description above, the TGT learning model has a more effective influence on student learning outcomes compared to the STAD learning model. This is in line with research conducted by Ariani & Agustini (2018) with the research title Comparison of Cooperative Learning Models of the TGT (Teams Games Tournament) Type and the STAD (Student Teams Achievement Division) Learning Outcomes in Volleyball Lower Passing, stating that there are differences in pretest scores before given treatment and posttest scores after being given treatment with an increase in student learning outcomes in the TGT class and in the STAD class. And higher learning outcomes are classes that use the TGT learning model.

Indraswari (2017) in her research on the comparison of student learning outcomes using the STAD and TGT learning models in financial accounting lessons in class XI Accounting at SMK N Mojoagung, argued that the application of the TGT type cooperative learning model was more effective for improving student learning outcomes than the STAD learning model. The existence of academic tournaments in the TGT tipr learning model adds to learning motivation as well as a high sense of competitiveness and can improve student learning outcomes.

Farida (2016) suggests that students who are given the TGT type cooperative learning model are more active in the learning process than the STAD type cooperative model. This was seen during group discussions in the TGT class, students divided tasks and shared responsibilities among group members so that each group was active and could deepen their understanding of the material being discussed. The TGT model really helps students to understand, analyze and even remember the material because there is an incentive to win the tournament so that each student tries to master the material before advancing to the tournament table in order to maintain the good name of the group through the value contribution that each group member must give to his group. And students in the TGT class are more enthusiastic in the learning process because of tournament games. Whereas the STAD model is also well applied, it's just that not all students really work on practice questions, are less active in group discussions and students who are good at dominating their groups. who are not smart.

In this study, a hypothesis test was carried out, namely comparing the Sig. (2- tailed) < or > 0.05. The results of the posttest calculations in the experimental class I and experimental class II with the Independent Sample T-Test obtained the Sig. (2-tailed) 0.008 <0.05 then Ho is rejected and Ha is accepted or there is a significant comparison between the posttest average scores in the experimental class I (using the TGT learning model) and experiment II (using the STAD learning model). The results obtained showed that there was a comparison of student learning outcomes using the cooperative learning model of the team games tournament type and student team achievement division in class XI IPA SMA N 1 Doloksanggul.

CONCLUSION

Based on the results of the research and discussion of the comparison of class XI student learning outcomes on the circulatory system material at SMAN 1 Doloksanggul, the conclusion obtained from the research that has been done is that there are significant differences in student learning outcomes in class XI in biology learning using the TGT learning model with STAD learning model at SMAN 1 Doloksanggul. Student learning outcomes in classes taught using the TGT learning model were higher with 86.14 compared to classes taught using the STAD learning model with a score of 81.91.

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