THE EFFECT OF TEAMS GAMES TOURNAMENT MODEL ON STUDENT LEARNING OUTCOMES ON THE HUMAN EXCRETORY SYSTEM MATERIAL IN CLASS XI AT SMA NEGERI 2 PERCUT SEI TUAN

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This study aims to determine the effect of the teams games tournament model on student learning outcomes on human excretory system material in class XI SMA Negeri 2 Percut Sei Tuan. This research uses quantitative methods with a pseudo-experimental approach. The research design used was non-equivalent control group. The research population includes all students of class XI SMA Negeri 2 Percut Sei Tuan, which consists of 6 classes. The research sample was selected using random sampling technique, class XI 3 SMA as the experimental class and class XI 4 SMA as the control class. The average data of pre-test and post-test of cognitive abilities in the experimental class were 50.44 and 86.44 and in the control class were 52.77 and 79.44. Based on hypothesis testing, for the experimental class and control class obtained t_{count} = 7.385 and t_{table} = 2.0017, then $t_{count} > t_{table}$. The results of observations of student activity at meeting one to meeting two have increased, at meeting one by 80% and at meeting two by 87%, it is concluded that there is an effect of the team games tournament model on student learning outcomes on the material of the human excretory system.

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INTRODUCTION

Education aims to develop students potential in cognitive, affective, and psychomotor domains. Biology, as a subject, emphasizes scientific work and scientific thinking. Schools must provide adequate facilities and infrastructure to ensure an effective teaching and learning process, including a supportive learning environment, complete instructional resources, and teaching approaches that encourage students to engage in learning (Ariyanti, 2020). Teachers can inspire students through their knowledge and experiences, motivating them to develop their scientific potential. In this way, teachers can create an enjoyable learning process, particularly in biology, through instructional models designed to maximize student learning outcomes (Nurhikmah *et al.*, 2021).

Student activity plays a crucial role in the learning process because it enables cognitive assimilation, accommodation, and feedback (BSNP, Depdiknas: 2006). Student activity in learning and teacher activity in teaching are complex, involving communication and interaction that depend on teachers' understanding of appropriate teaching methods and learning models (Pradja & Firmansyah, 2020). Students are expected to contribute actively in the learning process—for example, by raising their hands when teachers ask questions, expressing opinions, and asking questions (Artini *et al.*, 2015). Increased motivation and active participation are reflected in students' involvement, which is believed to enhance both the quality of the learning process and its outcomes (Zayyin, 2021).

Continuous evaluation can be used to measure learning progress throughout the process. Active participation during learning fosters curiosity, helping students explore information more deeply to improve their cognitive achievement. Conversely, low achievement suggests poor comprehension (Indra, 2009). Teachers play a key role in supporting struggling students by adapting instructional strategies into engaging, game-based approaches that enhance motivation (Setyawan *et al.*, 2020).

Instructional models are designed to help organize learning effectively for students. Many models have been developed to assist teachers in facilitating learning (Sugandi, 2002). The Teams Games Tournament (TGT) model is a cooperative learning approach that involves all students equally, without differences in status. It incorporates elements of games and competition, fostering responsibility, collaboration, and healthy competition among groups (Siregar, 2021). The human excretory system material is often considered difficult and monotonous, as students are expected to memorize Latin terms, distinguish processes, and understand the urine formation mechanism (Simorangkir & Napitupulu, 2020). TGT is expected to address these challenges by making learning more interactive and enjoyable.

RESEARCH METHOD

This study was conducted at SMA Negeri 2 Percut Sei Tuan, located at Jl. Pendidikan Pasar XII, Desa Bandar Klippa, Kabupaten Deli Serdang, North Sumatra, 20371. This research employed a quantitative method with an experimental approach. The research design was a Non-Equivalent Control Group Design. The population included all Grade XI students of 6 classes. Samples were chosen using random sampling: XI-3 served as the experimental class and XI-4 as the control class.

A multiple-choice test on the human excretory system was used to measure cognitive learning outcomes. Data collection

techniques included observation and testing. Instrument validation consisted of validity testing, reliability testing, difficulty level testing, and discrimination index analysis. Tests were administered twice: as a pretest and posttest. Data analysis techniques included normality testing, homogeneity testing, and hypothesis testing using a t-test.

RESULTS AND DISCUSSION

The data were collected from two groups: XI-3(experimental) and XI-4 (control). The experimental group was taught using the TGT model, while the control group received direct instruction.

The pretest results showed no significant differences between groups. The posttest results, indicated that the experimental group's average score (86.44) was higher than the control group's average score (79.44). the students' learning outcomes scores are presented in Figure 1 below.
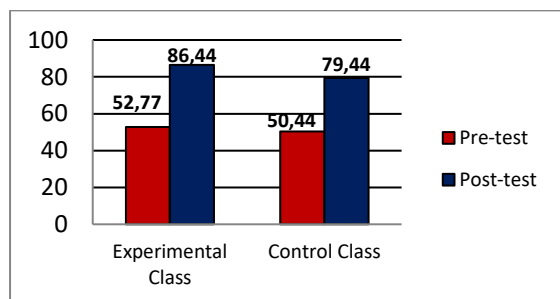

Figure 1. Diagram of Mean Scores for *Pre-test* and *Post-test*

Before proceeding with hypothesis testing, the learning outcome data from both classes were subjected to tests of normality and homogeneity.

Table 1. Results of Normality Test

Class	Data	$L_{calculated}$	L_{table}	Description
Kelas Eksperimen	*Pre-test*	0,108	0,161	Normally distributed
	Post-test	0,105	0,161	Normally distributed
Kelas Kontrol	*Pre-test*	0,093	0,161	Normally distributed
	Post-test	0,147	0,161	Normally distributed

Based on Table 1, it is shown that the calculated $L_{calculated} < L_{table}$ at α significant level of α = 0.05, indicating that the pre-test and post-test data for both classes are normally distributed.

Table 2. Results of Homogeneity Test

Class	Data	$F_{calculated}$	F_{table}	Description
Pre-test	Experimental Class	0,714	1,860	Data were homogeneous
	Control Class			
Post-test	Experimental Class	0,513	1,860	Data were homogeneous
	Control Class			

Based on Table 2, it is shown $F_{calculated} < F_{table}$ at a significant level of α = 0.05, indicating that the pre-test and post-test data for both classes are homogeneous.

Following confirmation that the data were normally distributed and homogeneous, a t-test was conducted to test the hypothesis. This analysis aimed to investigate the effect of the Teams Games Tournament model on students' learning outcomes in the excretory system.

Table 3. Results of Post-Test Hypothesis Test

Class	X	$T_{calculated}$	T_{table}	Description
Experimental Class	86,44	7,385	2,0017	Ha was accpeted
Control Class	79,44			

Based on Table 3 obtained that $t_{calculated} < t_{table}$ at the 0.05 significance level (α = 0.05),

indicating that the null hypothesis (H_o) is rejected and the alternative hypothesis (Ha) is accepted. This result demonstrates a significant difference in students' learning outcomes between the experimental and control classes. The students in the experimental class achieved higher learning outcomes compared to those in the control class.

Based on the collected data and the analysis conducted, the cognitive learning outcomes of the students were obtained. The average pre-test score for the experimental class was 52.77, while the control class had an average pre-test score of 50.44. After the implementation of the respective instructional models, a post-test using the same questions as the pre-test was administered. The average post-test score for the experimental class was 86.44, whereas the control class scored an average of 79.44. These results indicate that the average learning outcome score in the experimental class was higher than that of the control class.

The results of the study indicate that the Teams Games Tournament (TGT) model has a positive and significant effect on students' learning outcomes. The implementation of the TGT model was able to increase the average learning outcome scores compared to the direct instruction method. This is evidenced by the significant improvement in post-test scores in the experimental class using the TGT model. The different treatments applied to the two classes resulted in differences in learning outcomes.

The increase in scores in the experimental class demonstrates that the TGT model can support students in improving their academic performance. Based on the presented data, it is concluded that the Teams Games Tournament model encourages students to think actively and express their opinions, thereby enhancing their learning outcomes.

These results align with previous studies (Fauzi & Masrupah, 2024; Isnaeni, 2022) it was found that the average score of the experimental class significantly increased after the implementation of the Teams Games Tournament (TGT), and the difference in learning outcomes between the experimental and control classes was statistically significant. The difference in average learning outcomes before and after using the TGT model in the experimental class was greater than that in the control class, which used the direct instruction method. Furthermore, research by Isnaeni (2022) indicates that the optimal improvement in students' learning outcomes using the TGT model is due to the model's ability to provide students with direct involvement in the learning process. Learning through game-based methods fosters enjoyment, which positively influences students' motivation and enhances their learning outcomes.

The improvement in learning outcomes occurred because the Teams Games Tournament (TGT) model requires all students to thoroughly understand the material in order to participate optimally in the games. This model also fosters a sense of responsibility, cooperation, and higher learning motivation through group rewards and a healthy competitive atmosphere. Such a healthy competitive environment can enhance students' motivation to actively participate. This aligns with cooperative learning theory, which states that students involved in social interaction tend to have a better understanding of the subject matter (Solihah, 2016).

CONCLUSION

Based on the research results and the data obtained, the following conclusions can be drawn:

There is a significant effect of the Teams Games Tournament (TGT) model on students' learning outcomes in the excretory system topic for Grade XI students at SMA Negeri 2 Percut Sei Tuan. This is evidenced by the t-test results ($t_{Calculated}$ = 7.385 > t_{table} = 2.0017), indicating that the null hypothesis (H_o) is rejected and the alternative hypothesis (Ha) is accepted. An increase in student learning activities was observed in Grade XI students at SMA Negeri 2 Percut Sei Tuan following the implementation of the Teams Games Tournament model.

SUGGESTIONS

Based on the research findings and conclusions, the following recommendations are proposed: Teachers and teacher candidates are advised to consistently implement the Teams Games Tournament cooperative learning model, particularly in subjects that require student interaction and collaboration. It is essential to provide adequate instructional media and materials, as well as to manage time efficiently to ensure an effective and engaging learning process.

Future researchers are encouraged to conduct further studies across different subjects and educational levels to expand insights into the effectiveness of the TGT model and to explore the facilitating and inhibiting factors affecting its implementation.

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