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Analysis of the Effect of Team Games Tournament (TGT) Type-Cooperative Learning Model on Students' Interest and Learning Outcomes on the Concept of Viruses and Their Role in Life

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Abstract

Education is a conscious and planned effort to create a learning atmosphere and learning process that enables students to actively develop their potential, including knowledge, capability, creativity, independence, and a noble character. This study aimed to analyze the effect of Team Games Tournament (TGT)-type cooperative learning on students' interest and learning outcomes regarding the concept of viruses and their role in life. The method employed in this research was a descriptive approach with a quantitative orientation. The research subject involves students of a high school in Serang, Banten. The study showed that the application of the TGT in the learning process significantly increased students' interest and their learning outcomes. Students were more active and competitive between learning groups. In conclusion, the TGT has a positive effect on students' interest and learning outcomes.

Keywords: Team Games Tournament (TGT), Cooperative learning model, Learning interest, Learning outcomes, Virus concept

INTRODUCTION

Education plays a crucial role in a nation's development, as it forms the foundation of the development process. Educational progress has a significant impact on the development of science and technology. According to the National Education System Law No. 20 of 2003, the purpose of national education is to develop abilities, shape character, and contribute to the nation's civilization. The purpose of national education is to develop students into individuals who are devoted to God Almighty, possess noble character, and are healthy, knowledgeable, capable, creative, independent, democratic, and responsible citizens (Ministry of Education of the Republic of Indonesia, 2003).

Education aims not merely to deliver facts and data to students, but to cultivate their ability to learn autonomously and efficiently. Instead of simply transferring knowledge, education focuses on encouraging learners to seek out information by asking questions, conducting research, drawing connections among ideas, and linking new knowledge with their existing understanding (Ari & Sadi, 2019). Selecting approaches that promote critical thinking and exploration among learners can more effectively convert educational objectives into observable behaviors. Such strategies actively involve students and help them link their existing knowledge with new information. In the field of educational theory, this method is referred to as constructivism, originally introduced by Piaget (1953) and later expanded upon by Bruner (1966). The core idea behind this theory is that learners actively evaluate new

knowledge and experiences against their existing beliefs, leading them either to adjust their behaviors or to reject the new information based on their critical assessment (Lockey *et al.,* 2021).

Learning is a system consisting of three components: inputs, processes, and outputs. Inputs are the initial conditions that teachers face, such as students' prior abilities before participating in the learning process. Outputs are the achievement of learning objectives. Learning outcomes are inseparable from learning processes organized by teachers. After following a series of learning processes, students will achieve the set objectives. The quality of the output depends on the quality of the input and the learning process. In this case, good outcomes are possible even with poor inputs, provided the learning process is effective and appropriate. Therefore, to ensure satisfactory learning outcomes, the organization of the learning process must be optimal, incorporating a variety of teaching strategies. In this case, a teacher's pedagogical competency is essential because it improves teaching performance (Santoso, 2018).

Within a constructivist learning environment where students actively build their own understanding, instruction should involve tasks that promote meaningful learning, foster the application of higher-order thinking skills, and support collaboration, idea-sharing, and engagement in dialogue. The Team Games Tournament (TGT) serves as an effective instructional approach that fosters knowledge acquisition, encourages group collaboration, and promotes active student engagement during classroom learning. According to Slavin (2005), the Team Games Tournament (TGT) cooperative learning model can enhance basic skills, improve student learning achievement, foster positive interactions between students, promote acceptance of classmate diversity, and increase self-confidence. By implementing the Team Games Tournament (TGT), students are expected to become more interested in the subject matter, as lessons are delivered in a more engaging and enjoyable way.

The purpose of this study is to analyze the effect of the Team Games Tournament (TGT) on students' interest in learning and learning outcomes related to the concept of Viruses and their role in life. Students' interest in learning is an essential factor that influences their learning outcomes and performance. Students with a high interest in learning tend to achieve high learning outcomes, and vice versa. Teachers must arouse students' interest in learning so they can achieve their learning goals.

METHOD

This research used a descriptive method with a quantitative approach (Azwar, 2008). The study aimed to describe the effects of the Team Games Tournament (TGT) on students'

interest in learning and learning outcomes regarding the concept of viruses. The subjects were students from two classes with varying student numbers and heterogeneous learning abilities at a senior high school in Serang City, Indonesia. Class X-1 had 38 students and Class X-2 had 35 students. These classes were selected to enable a more comprehensive analysis by considering the variation in student characteristics and learning processes that may differ between classes.

The research procedure began with the implementation of the TGT in each class. It included interactive learning sessions and competitions between groups. After the interactive learning session ended, the competition began. Students were directed to form heterogeneous groups, meaning they were not grouped based on ability. Then, all groups received a carton containing five pieces of paper with questions on them. Each group received one carton containing five questions. All group members discussed the questions and attempted to answer them, with a sense of competition among the groups. While implementing the TGT, students' activities were observed, and learning outcomes were recorded. Learning outcome data were collected using test instruments consisting of essay and short-answer questions related to the concept of viruses.

Descriptive statistical techniques were employed to analyze the quantitative data and describe students' interests, as well as the distribution of learning outcomes. Inferential analysis was also used to test the effect of applying the TGT model on these variables. All obtained data can be processed based on individual student scores. This analysis offers insights into the evaluation of learning outcomes and students' engagement after the application of the TGT model. The collected data is analyzed by classifying students' individual scores into three levels-low, moderate, and high-based on the average score and standard deviation of the dataset.

RESULTS AND DISCUSSION

The research took place in two tenth-grade classes at a senior high school located in Serang City, Indonesia. Throughout the learning sessions, student engagement was monitored as they participated in the Team Games Tournament (TGT) instructional model. At the conclusion of the lesson, their comprehension of viral concepts and functions was assessed. The results of the learning evaluation are presented in Table 1.

Table 1. Student learning evaluation results based on its category

Value Range	Category	Class	
		X-1	X-2
N < 34	Low	7	8
34 < N < 61	Medium	25	6
N > 61	High	6	21

The score reflects students' ability to answer questions on a carton displayed on the classroom blackboard. Each TGT carton contains five questions that must be solved by each student in the group (Table 2). The questions were listed on each carton, and students were required to answer them on the blank paper provided in the column.

Table 2. Question items (virus concept) on the TGT carton

No.	Categories
1.	List at least five characteristics of bacteria!
2.	Name at least five structures found in bacteria!
3.	Bacteria can be distinguished by their shape. Which type of bacteria has a round and oval shape?
4.	How do bacteria reproduce?
5.	Name three groups of archaea!

Team Games Tournament (TGT) represents a form of cooperative learning, where students engage in structured, small-group settings to enhance both their own understanding and that of their peers. Essentially, this approach involves collaboration among students, allowing them to learn together by sharing knowledge and experiences. Through this process, learners actively build their knowledge in the classroom-gathering information, identifying causal links, making observations, and exploring topics before reaching conclusions. Compared to traditional methods, cooperative learning has been shown to positively influence academic performance, boost information retention, and foster students' communication, critical thinking, and creative abilities (Arı & Sadi, 2019). The TGT-type cooperative model trains students to express or convey their ideas, to respect others' ideas and opinions, and fosters a sense of social responsibility (Widyastuti *et al*., 2023).

A study conducted by Pongkendek *et al*. (2019) revealed that the TGT type cooperative learning model, applied in a chemistry class, particularly on the concept of salt hydrolysis, had a positive effect on students' learning outcomes. During the learning process, students were actively engaged in group discussions. They compete with each other in a tournament table facilitated by the teacher at the end of the lesson. Similar results were also found by Widyastuti *et al*. (2023) on the concept of animalia, by Astuti *et al*. (2024) on Natural Events teaching material, by Lestari *et al*. (2023), Adnyana (2020), and Pratama *et al.* (2023) on the Biology topic, Rahma *et al*. (2023) on the concept of classification of living things, and by Liantri *et al*. (2024) on the concept of the immune system. Juwita *et al.* (2017) also found that TGT application could increase learning motivation and achievement in studying the anatomy and physiology of the nervous system.

According to Damayanti (2022), student learning outcomes are influenced by two primary categories of factors: internal and external. Internal factors emerge from within the

student and can be classified into three main dimensions-physical conditions, psychological aspects, and levels of fatigue. In contrast, external factors arise from the individual's surrounding environment, particularly the social context. Among the internal influences, student interest and motivation play a significant role in shaping academic performance.

Interest is interpreted as the feeling of wanting to give your attention to something or to be involved with and discover more about it. When a student has an interest in learning processes, they tend to enjoy doing the activities. As stated by Azis & Pertiwi (2021), student interest is the main factor determining the degree of student learning activity. Interest means being busy, interested, or fully involved in an activity because one recognizes its importance. Interest is a factor that appears complex. The emergence of interest can be attributed to its suitability with talent, the teacher's success in stimulating the child, the influence of close friends, the environment, and so on.

In this study, student interest in learning is evident during the TGT learning processes related to virus concepts. Students join the lesson with enthusiasm. Each individual tries to solve the given problems with excitement. In addition to the fact that this model is still unfamiliar to students at school, the TGT can bring fun learning through games. The tournament session creates an atmosphere of positive spirit with healthy competitiveness between groups of students. In line with the results of this study, a study conducted by Muldayanti (2013) revealed that the application of the TGT model increased student motivation and interest in learning. In particular, this is because students learn through games and are encouraged to compete academically in a tournament session.

A cooperative learning model, including the TGT, has a positive effect on students' academic achievement when compared with the traditional method, increases the level of information retention, and improves students' communication, problem-solving, and creative skills (Arı & Sadi, 2019). Through a study, Rukmi et al. (2020) also confirm that the application of the TGT learning model is more effective than the conventional learning model in biology education. The TGT learning model offers educators a structured approach to teaching students, ranging from basic to advanced concepts. Additionally, it provides opportunities for students to investigate, observe, learn, and solve their learning problems.

CONCLUSION

The application of the Team Games Tournament (TGT) type cooperative learning model in measuring student learning outcomes yielded a positive impression, both in terms of the results obtained and student responses. Compared to the application of conventional techniques, the application of the TGT type was able to improve student learning outcomes

and interest. The dominance of students with high learning outcomes in biology is evidenced by their increased activity and ability to cooperate and learn from one another during the learning process. When students have a high interest in learning, they tend to achieve high learning outcomes, and vice versa. Teachers must strive to pique students' interest in learning, enabling them to achieve their learning objectives.

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