



Effect of Teams Games Tournament Model on Students' Science Achievement

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ABSTRACT

This study aimed to enhance students' learning outcomes through the application of the Team Games Tournament (TGT) cooperative learning model. The research followed a Classroom Action Research (CAR) design and was carried out in two cycles, each consisting of four stages: planning, implementation, observation, and reflection. The participants were 36 Grade XI Science 5 students at SMAN 1 Palu during the even semester of the 2024/2025 academic year. Learning outcomes were evaluated using the class average scores from the final evaluation sheets, supported by the percentage of students who achieved mastery learning. Data were collected through Google Forms and analyzed using a five-point Criterion-Referenced Assessment (CRA) scale. The findings revealed an improvement in learning achievement from Cycle I to Cycle II. In Cycle I, the average student score was 73.87, categorized as moderate, whereas in Cycle II it increased to 85.21, categorized as high. Additionally, the mastery learning percentage rose from 45% in Cycle I to 71.3% in Cycle II. These results indicate that the implementation of the TGT cooperative learning model effectively enhances students' learning outcomes in Biology.

INTRODUCTION

Education is a key pillar in supporting a nation's development and progress. In today's globalized era, where competition is increasingly intense, countries with high-quality education systems are better positioned to gain a competitive edge. In Indonesia, efforts to improve and maintain education quality can be carried out through several strategies, including curriculum reform, strengthening teachers' professional skills, providing adequate learning facilities, fostering creativity in the teaching and learning process, implementing comprehensive assessment systems, and applying effective and targeted instructional approaches (Naulandani et al., 2023; Desi et al., 2023).

The Merdeka Curriculum emphasizes a shift in learning strategies from a teacher-centered approach to a student-centered approach (Mu'aziyah & Isnawati, 2023). Consequently, students are encouraged to take a more active role in the learning process, while teachers function as facilitators or guides (Rozali et al., 2022). One suitable way to realize this paradigm is through cooperative learning, which promotes collaboration and active student involvement across all subjects, including Biology. At the senior high school level, Biology is essential for helping students understand scientific concepts relevant to daily life, yet many still struggle with abstract and complex materials.

The daily teaching and learning process is inseparable from various challenges. These include learning indicators that remain at lower levels of cognitive, affective, and psychomotor domains; instructional materials that are predominantly cognitivist; limited use of contextual resources; reliance on conventional teaching methods that do not foster active learning; and underdeveloped assessment instruments (Akbar, 2017). External factors such as teacher influence, the social environment, and resource availability also affect learning outcomes (Rahman, 2021). Learning outcomes cover cognitive, affective, and psychomotor domains, with the cognitive aspect often reflected in students' academic performance. To improve them, educators must implement engaging instructional models such as cooperative learning, which motivates students through collaboration and group interaction.

Preliminary findings revealed that the average score of Grade XI Science 5 students was only 70, categorized as low. Diagnostic assessments also showed that 72.2% of students preferred Biology lessons integrated with games. However, students' independence in learning remained low, reflected in habits such as copying homework from peers and limited mastery of material (Awdry & Ives, 2021). A lack of instructional variety further caused boredom and passivity, which hindered deeper understanding. Similar concerns were noted by Rahmi et al. (2023), who emphasized the importance of learning independence for mastering content, and by Irwandi & Fajeriadi (2019), who argued that engaging approaches can improve students' ability to express ideas.

The Team Games Tournament (TGT), as a type of cooperative learning, accommodates these needs by combining group collaboration with game elements that make learning more engaging and enjoyable (Amni & Ningrat, 2021). Its foundation lies in social constructivist theory, particularly Vygotsky's Zone of Proximal Development (ZPD), where students achieve higher understanding through peer interaction and teacher guidance. Prior studies confirm the effectiveness of TGT: Safniyeti (2017) found it significantly improved students' academic performance; Amir et al. (2024) reported positive outcomes in Grade III mathematics learning at UPTD SD Negeri 24 Pare-pare; and Yulianti et al. (2023) showed its advantages in Islamic Religious Education and Character (PAIBP) for Grade V students at SDN 243 Cicabe compared to conventional methods.

Based on these prior research findings, the researcher plans to carry out a study entitled "*The Effect of the Team Games Tournament (TGT) Model on the Science Achievement of Grade XI Science 5 Students in Biology at SMA Negeri 1 Palu*". The main problem addressed in this study is the low science achievement of students in Biology, which the researcher aims to improve through the implementation of the TGT cooperative learning model.

METHOD

This study was conducted as Classroom Action Research (CAR) at SMA Negeri 1 Palu. The participants were Grade XI Science 5 students in the 2024/2025 academic year, consisting of 36 students (21 females

and 15 males) with varying academic abilities. The research focused on students' learning outcomes and was carried out from March to April 2025. The research design followed the model developed by Kemmis and McTaggart, as illustrated in the Figure 1.

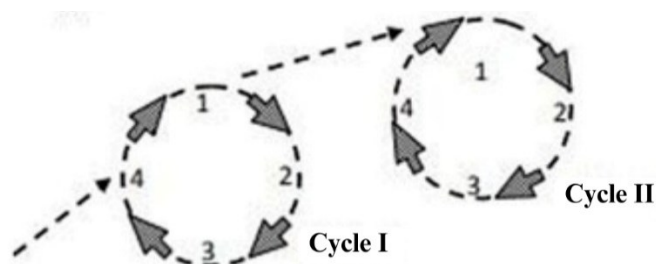


Fig 1. Two-Cycle Classroom Action Research Model
 (Kemmis and McTaggart as cited in Ariesta et al., 2024)

Description:

- 1 : Planning
- 2 : Implementation
- 3 : Observation
- 4 : Reflection

According to Syaifudin (2021), this model comprises four main components: planning, action, observation, and reflection. These elements constitute a full cycle of classroom action research, which is repeated until observable improvements in the learning outcomes of Grade XI Science 5 students are achieved through the implementation of the Team Games Tournament (TGT) cooperative learning model. Progress is assessed using evaluation data collected at the conclusion of each cycle. The results from Cycle I are then compared with those of the following cycles to evaluate improvements and determine the effectiveness of the TGT model in enhancing students' academic performance.

The instruments employed in this study included: (1) a Diagnostic Assessment Sheet, designed to gather information on students' learning styles, difficulties, and preferences in Biology; and (2) a Learning Outcomes Evaluation Sheet, used to assess students' comprehension following the implementation of the Team Games Tournament (TGT) cooperative learning model. Data were collected through Google Forms, where students selected the available options and filled in the designated response fields. The study was considered successful if there was an observable increase in the average learning outcomes for each cycle. In addition, students' performance was evaluated using a five-point Criterion-Referenced Assessment (CRA), as summarized in Table 1.

Table 1. Learning Outcome Criteria

Percentage	Category
≥ 80%	Very High
60 – 79%	High
40 – 59 %	Moderate
20 – 39 %	Low
< 20 %	Very Low

(Widiarsa, 2020)

Meanwhile, the percentage of students' learning mastery was also calculated based on the Minimum Mastery Criterion (MMC), which was set at 80. The calculation of learning mastery was carried out using the following formula:

$$\text{Learning Mastery (\%)} = \frac{\text{Number of students achieving mastery}}{\text{Total number of students}} \times 100\%$$

The mastery percentage was used solely as supplementary data to support and reinforce the learning outcomes of Grade XI IPA 5 students at SMA Negeri 1 Palu.

RESULTS AND DISCUSSIONS

RESULTS

The implementation of Cycle I was conducted in a single meeting (2×45 -minute lesson periods) using the cooperative learning model *Team Games Tournament* (TGT) on the topic of the coordination system, specifically the hormonal system subtopic. The students were organized into four heterogeneous groups, while the teacher served as both facilitator and timekeeper. At the tournament stage, a domino card game was employed, consisting of paired concepts of hormones and their respective functions. The evaluation results at the end of Cycle I indicated an average score of 73.87, with a learning mastery rate of 45% (16 out of 36 students). A comparison of the average learning outcomes of XI IPA 5 students at SMA Negeri 1 Palu, based on the evaluation sheet, is illustrated in Figure 2.

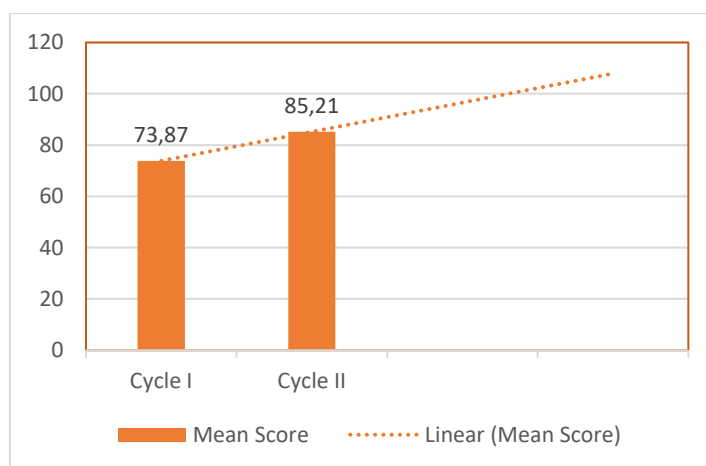


Fig 2. Diagram of the Comparison of Average Learning Outcome Scores in Cycle I and Cycle II

In Cycle II, the intervention was carried out in a single session using the *Team Games Tournament* (TGT) cooperative learning model. The group arrangement remained the same; however, the learning activity consisted of a word search puzzle related to the endocrine system. The results of the assessment demonstrated a notable improvement, with an average score of 85.21 and a mastery learning rate of 71.3% (26 out of 36 students). This represents an increase of 11.34 points in the average score and a 26.3% improvement in learning mastery. These results indicate that implementing the TGT cooperative learning model can effectively enhance the academic achievement of Grade XI IPA 5 students at SMAN 1 Palu. Moreover, a comparison of the learning mastery outcomes is presented in Figure 3.

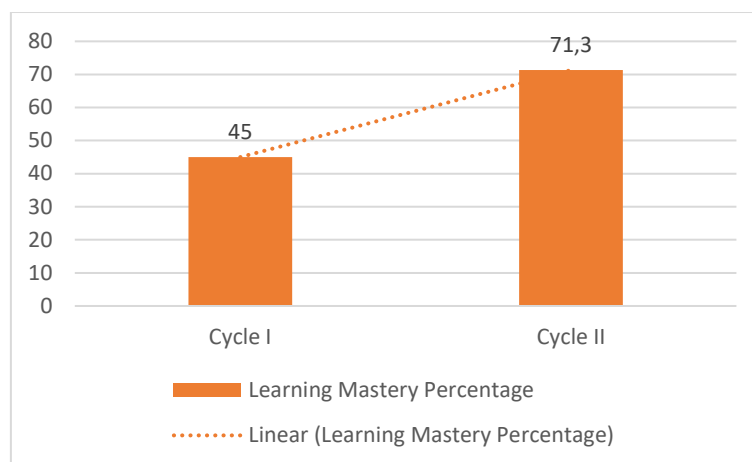


Fig 3. Diagram of the Comparison of Learning Mastery Percentages in Cycle I and Cycle II

DISCUSSIONS

The results of this study suggest that the application of the Team Games Tournament (TGT) cooperative learning model positively influenced the improvement of students' learning outcomes. In Cycle I, the class average score was still in the moderate category with a relatively low level of mastery. This condition can be explained by several factors, such as students still being in the stage of adapting to the tournament mechanism, group dynamics that were not yet optimal, and limited mastery of the material. This is consistent with the findings of Batania (2025), who stated that the success of implementing cooperative learning models is strongly influenced by students' readiness to understand the learning rules, their ability to collaborate, and their mastery of the subject matter as the foundation of the learning process.

Despite the results from Cycle I showing that the TGT model effectively encouraged active student participation in the learning process, the academic achievements had not reached satisfactory levels, indicating the need for further intervention in the subsequent cycle. This finding is consistent with Kusumadiputra et al. (2017), who reported that the TGT model had a notable positive effect on the learning outcomes of Grade XI ICT students at SMA Negeri 1 Sawan. Their study also indicated that students demonstrated higher motivation and more favorable responses to TGT compared to the Learning Tournament model and conventional instructional approaches. Thus, the results from Cycle I correspond with prior research, suggesting that students favor TGT due to its more engaging and enjoyable learning experience. This conclusion is further supported by Almagfira (2024), who found that the application of the Team Games Tournament (TGT) cooperative learning model significantly improved both student motivation and learning outcomes at SMP Negeri 14 Palu.

In Cycle II, students' learning outcomes showed a marked improvement. The class average score rose to 85.21, and the mastery percentage reached 71.3%. These results indicate that students had become more familiar with the tournament procedures, collaborated more effectively, and were better prepared for the learning activities. This also suggests that the follow-up actions based on reflections from Cycle I, particularly regarding classroom management and mastery of content, had a positive effect. These findings align with Safniyeti (2017), who reported that the implementation of the Team Games Tournament (TGT) cooperative learning model not only enhances students' learning outcomes but also creates a more engaging and meaningful learning experience.

In addition, the incorporation of game elements in the cooperative learning model type TGT has been proven to reduce the perception that Biology lessons are monotonous. Purwandari & Wahyuningtyas (2017) emphasized that TGT helps diminish students' negative perceptions of learning by creating a more engaging atmosphere. In line with this, Sudimahayasa (2015) highlighted that the model introduces a dimension of enjoyment through game-based activities. This perspective is further reinforced by Susanna (2018), who explained that TGT not only enhances teachers' performance in delivering instruction but also fosters students' academic achievement. According to her, TGT can be viewed as a strategy, a method, and simultaneously a learning process that sharpens understanding, strengthens memory retention, and creates an enjoyable as well as meaningful learning experience.

However, achieving such outcomes requires teachers to possess thorough mastery of the subject matter and the ability to guide students in accurately understanding and applying concepts to real-life contexts. The local context of SMA Negeri 1 Palu also played a role, as students initially showed hesitation in adapting to collaborative competition due to different learning habits and varying levels of confidence in expressing ideas. Through continuous practice in group interaction, they gradually became more open, cooperative, and confident. From the teacher's reflection, it was found that careful preparation of learning media, management of time allocation, and consistent encouragement were crucial in ensuring the success of TGT in this setting.

Based on the empirical findings of this study, and supported by previous research, it can be concluded that the implementation of the Team Games Tournament (TGT) cooperative learning model is effective in enhancing students' learning outcomes while simultaneously fostering collaboration, motivation, and a more positive perception of Biology learning in the local classroom context of SMA Negeri 1 Palu.

CONCLUSION AND SUGGESTION

Based on the findings, it can be concluded that the implementation of the Team Games Tournament (TGT) cooperative learning model improved the learning outcomes of Grade XI Science 5 students at SMA Negeri 1 Palu, as shown by the increase in the average score from 73.87 in Cycle I to 85.21 in Cycle II and the rise in mastery learning from 45% to 71.3%. While this study was limited by a small sample, only two cycles, and the absence of long-term evaluation, the results suggest that TGT is effective in fostering motivation, participation, and collaboration. Future research is encouraged to involve larger samples, extend the cycles, and examine long-term impacts, while teachers in other contexts are advised to apply TGT with appropriate training and, where possible, integrate digital media to enrich the tournament process and sustain student engagement.

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