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THE EFFECT OF COOPERATIVE LEARNING MODEL USING GAME-BASED MEDIA TOWARD STUDENTS' LEARNING OUTCOMES AND ACTIVITY

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ABSTRACT

This study aims to determine the effect of the implementation of the Team Games Tournament (TGT) type cooperative learning model assisted by wordwall quiz media on earth and solar system material on learning outcomes and activeness of seventh grade students of SMPN 6 Kisaran. The study used a Quasi Experimental design with a Pretest and Posttest Control Group Design research design. The sample consists of two classes, namely the experimental class with the TGT learning model and the control class using the direct learning model with a total of 32 students each. Sampling was done by random sampling technique. Data collection was carried out using tests and observations. The data were analyzed by testing the hypothesis using the Mann Whitney test on student learning activeness and the Independent Sample T-test on student learning outcomes. The results of observations of student learning activeness show that the average value of student learning activeness of the experimental class is 79.2 which is included in the category of very active and the control class is 65.2 which is included in the active category. The pretest learning outcomes of students in the experimental class showed an average value of 36.6 students and in the control class 33.6. The posttest learning outcomes of students in the experimental class showed an average score of 78.4 with 24 students complete and in the control class 57.3 with 4 students complete. Hypothesis testing shows that there are significant differences in student activeness and learning outcomes in the experimental class using the Teams Games Tournament Type Cooperative learning model assisted by Wordwall Quiz compared to the control class using the direct learning model on solar system material.

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Introduction

The independent curriculum restores the important role of educational institutions, teachers, and students in creating learning experiences that are tailored to the needs and abilities of each student. This motivates students to participate in interactive learning that strengthens the relationship between students and educators. In addition, this curriculum encourages students to have critical thinking, analytical reasoning, creativity, and teamwork which are important skills in the 21st century. Teachers must also be actively involved in preparing and improving themselves to become skilled, creative, and capable educators (Padilah et al., 2023).

One of the science lessons in junior high school is the presentation of solar system material which has a fairly broad scope of learning so that it demands a high level of understanding. Students often tend to memorize the solar system without understanding the characteristics and shape of each celestial body. Memorizing like that causes students to forget the material more quickly so that it will result in the inability of most students to explain it when reviewed again. Students must not only understand the concepts and theories, but also relate them to real life for a more meaningful learning experience. This connection to everyday life not only improves the quality of learning, but also fosters greater engagement and better learning outcomes for students.

The problems found at SMPN 6 Kisaran based on the results of interviews with science teachers at the school, students were still found to have difficulty in learning the solar system material, especially in the presentation of the characteristics of each planet and other celestial bodies. If students cannot understand the components of the solar system and their characteristics, students will have difficulty understanding celestial phenomena and their influence on the earth.

In order to accomplish the established learning objectives, students in specific groups engage in a series of learning activities known as the cooperative learning model. Four students who vary in ability or group size participate in cooperative learning. Cooperative groups are formed, and students receive specialized training on how to support one another, collaborate effectively, provide clear explanations, and pose insightful questions. According to Isjoni (2019), cooperative learning is a type of learning paradigm where students collaborate in small groups of five people with a variety of group structures. Cooperative learning, on the other hand, is a method or set of techniques created especially to motivate students to collaborate during the learning process, claims Supriono (2020).

Simply learning in groups is not the same as using a cooperative learning methodology. There are fundamental components of cooperative learning that set it apart from randomly assigned group division. Teachers will be able to run their classes more skillfully if they appropriately implement cooperative learning model processes.

Cooperative learning involves group instruction, where students in a class are divided into four to five-person groups to help them understand topics that are guided by the teacher. Cooperative learning model is a learning model with small groups by paying attention to the diversity of group members as a forum for students to work together and solve a problem through social interaction with their peers, providing opportunities for students to learn

The use of the right learning model is needed to increase more active student participation so that it will improve their learning outcomes. A group tournament-based learning model such as the Team Games Tournament cooperative model can be a solution to overcome these problems. In using the Team Games Tournament learning model, students both individually and in groups actively create and organize information obtained from cooperative group work. The core of the Team Games Tournament cooperative learning model is cooperation between students in each group, healthy competition between students between groups, and active involvement in the learning process. This model is able to increase student involvement which will have a good impact on learning objectives (Astuti, 2022).

The use of the TGT model will be more interesting if it uses the help of learning media. As Launin (2022) said, students' motivation to learn can be increased by using interesting learning media. Wordwall Quiz is a web-based digital gamification platform with various game and quiz capabilities that are very compatible with the TGT concept. With the help of various game elements, students can better understand the principles of the solar system. For example, students can match descriptions of the celestial planets with visuals in the Find the Match game. The results of the Wordwall Quiz are considered quite useful in helping students understand the concept of the solar system.

Research Methods

This research is quantitative research. The research method applied in this study is the Quasi Experimental Design method using a pretest-posttest control group design. This research was conducted at SMPN 6 Kisaran in the even semester of the 2023/2024 school year. The population in this study were all class VII students at SMP Negeri 6 Kisaran, totaling 6 classes with a total of 192 students. The sample in this study was taken using a random sampling technique, namely by drawing lots. The samples obtained were class

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VII1 as the experimental class and class VII-5 as the control class, both classes consisting of 32 students each.

The data obtained both learning outcome test data and observations of student learning activity were previously analyzed using the normality test with the Kolmogorov Smirnov test on the Statistical Program for Social Science (SPSS) version 27 application on the pretest and posttest of learning outcomes and the average learning activity of students, homogeneity test using the Homogeneity of Variance test on the SPSS version 27 application on student learning outcomes as a prerequisite test before conducting a hypothesis test. Hypothesis testing using the Independent Sample T-Test on the SPSS version 27 application on the pretest and posttest of learning outcomes and the Mann Whitney u Test on the average learning activity of students.

The hypotheses used in this study are:

Student Learning Activity

H0: There is no significant difference in student learning activity in the experimental class using the Teams Games Tournament type cooperative learning model assisted by Wordwall Quiz compared to the control class using the direct learning model on the solar system material.

Ha: There is a significant difference in student learning activity in the experimental class that uses the Teams Games Tournament type cooperative learning model assisted by Wordwall Quiz compared to the control class that uses the direct learning model on the solar system material.

Learning outcomes

H0: There is no significant difference in student learning outcomes in the experimental class using the Teams Games Tournament type cooperative learning model assisted by Wordwall Quiz compared to the control class using the direct learning model on the solar system material.

Ha: There is a significant difference in student learning activity in the experimental class that uses the Teams Games Tournament type cooperative learning model assisted by Wordwall Quiz compared to the control class that uses the direct learning model on the solar system material.

Results and Discussion

Learning Activity shows that a graph of student learning activity data on the material on the earth and the solar system in the experimental class using the Team Games Tournament learning model and the control class using the conventional learning model:

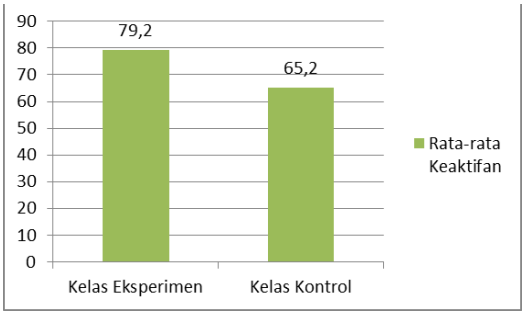
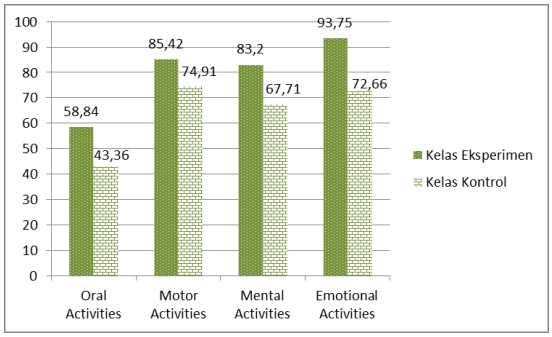


Figure 1. Diagram of Junior High School Students' Activeness Values in Learning the Material of the Earth and the Solar System, Sub-Material of the Solar System

Based on Figure 1, it can be seen that the experimental class and the control class have different learning activity values. The average range of difference values in both classes has a difference value of 14. The difference in learning activity values between the experimental class and the control class shows a difference in the influence of the application of different treatments in each class. In addition, the learning activity value in the experimental class reached 26 students in the very active category and 7 students in the active category. In the control class, the student learning activity value was dominated by the active category of 29 students, followed by the passive category of 3 students. This can be interpreted that the experimental class that was taught with the Team Games Tournament model was better at stimulating student learning activity than the control class that was not taught the Team Games Tournament learning model.

Data on student learning activity in each aspect of the experimental class and control class can be seen



in Figure 2 below:

Figure 2. Students' Learning Activity Aspect Diagram for Earth and Solar System Material, Solar System Sub-Material

Mental Activities in the experimental class has the highest value level of other aspects in each class, this is due to the influence of the learning model applied in the experimental class, namely

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the cooperative model of the Team Games Tournament type assisted by Wordwall Quizz media which can stimulate and increase students' enthusiasm for learning through their enthusiasm and cooperation in learning activities. This is not possessed by students in the control class.

Oral Activities in the control class has the lowest value of all other aspects in each class, this is due to the lack of interest of students in the control class to ask questions either to the teacher or to peers. In addition, students in the control class appear passive in expressing their opinions and appear less cooperative in groups, generally only a few members in each group are actively involved in working on the LKPD. In contrast to the experimental class, students in this class actively ask questions both to the teacher and their peers, they also appear active in working together to complete the LKPD and Wordwall quizzes. The treatment of different learning models is what makes a significant difference in every aspect of learning activity in the experimental and control classes.

Learning Activity Hypothesis Test

Table 1. Results of Hypothesis Testing of Student Learning Activity on Solar System Material

Test Statistics

	Learning Activity
Mann-Whitney U	44,500
Wilcoxon W	572,500
Z	-6.284
Asymp. Sig. (2-tailed)	.0001

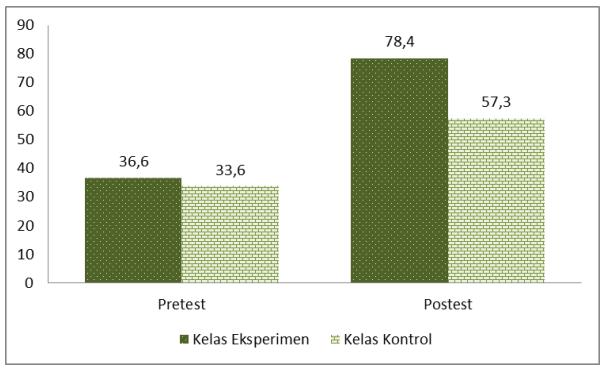
a. Grouping Variable: Class

The results of the data hypothesis test are 0.001 <0.05, so based on the data it can be concluded that H0 is rejected and Ha is accepted. Based on the hypothesis test tested with SPSS, it can be concluded that there is a difference in student learning activity in classes that use the Teams Games Tournament type, Cooperative model on the solar system material compared to the direct model.

Learning outcomes

Cognitive ability data were obtained through pretest and posttest given to the experimental class using the Team Games Tournament learning model and the control class using the direct learning model. The initial test (pretest) was conducted to determine the initial abilities of students while the final test (posttest) was conducted to determine the increase in students' abilities after learning.

Based on the figure above, it can be seen that there is not much difference between the average pretest score of the experimental class and the pretest score of the control class, which is 3. This shows that the initial abilities of students in the



experimental and control classes are not much

Figure 3. Cognitive Learning Outcome Value Diagram of Junior High School Students on the Earth and Solar System Material, Solar System Sub-Material

After knowing the initial ability (pretest) of the students, the learning process is carried out. Learning ends with students being given a posttest to determine the cognitive abilities of the two groups of students after being given treatment. The results of the study showed that students in the control class and in the experimental class had quite a significant difference, which was 21.1.

The Team Games Tournament cooperative learning model enhances learning by providing students with hands-on experience in academic games during competitions. This game serves as a review, reinforcing students' knowledge of the material they have learned and improving their memory before individual exams (Drayatun, 2017). This is also supported by Hikmah & Anwar (2018) Students who are taught with the Team Games Tournament model have a significant impact on their motivation and learning achievement. The Team Games Tournament cooperative learning model encourages students to engage in various learning activities that increase their activeness, which in turn can affect learning outcomes. In the learning process, students who follow the Team Games Tournament model go through several stages of activities that help them process and understand the subject matter better.

Based on the results of the study, the learning outcomes of students who were taught using the Team Games Tournament learning model showed different learning outcomes from the learning outcomes of students who were not given the Team Games Tournament learning model. Although both classes completed the LKPD, the cause of the significant difference in learning outcomes between the experimental class and the control class was the non-complex learning model applied in the control class. The existence of more complex activities starting from working on LKPD in groups and conducting game tournaments made students better able to remember the learning so that it could affect student learning outcomes.

As in the first meeting, during the class

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presentation, the teacher presented the topic of 8 planets in the solar system and planetary groupings. After the class presentation was completed, the class entered a group learning phase where each group was asked to study and work together with their group members to fill in the description of the characteristics of the planets based on the pictures of the planets and also the groupings of the planets listed in the student worksheet that had been distributed. Furthermore, the class entered the match game phase, students at the first meeting played the Match up game, namely matching a collection of statements about the planets according to the choice of planetary pictures listed. Repetition of learning materials in each phase above occurs at each meeting, so that students can easily remember and understand the learning topic. This is supported by the results of Mardhiyah's research (2022) which states that the use of Wordwall quizzes in games can improve students' understanding and memory. Participating in group game activities also encourages a good environment and increases student engagement, and minimizes boredom.

Hypothesis Testing of Learning Outcomes

Table 2. Results of Hypothesis Testing of Student Learning Outcomes on Solar System Material

Independent Samples Test

	Sig. (2tailed)
Learning outcomes	.001

The results of the hypothesis test of learning outcome data are 0.001 < 0.05, so based on these data it can be concluded that there are differences in cognitive learning outcomes in classes that use the Teams Games Tournament type, Cooperative model on the solar system material compared to the direct model.

Cooperative learning is one of the teaching and learning models where students in the class are seen as groups or divided into several groups to work together so that learning objectives can be achieved (Soleha, 2016). To achieve maximum learning objectives in cooperative learning, there are five elements of cooperative learning that must be applied, namely: 1) Positive interdependence is creating effective working groups according to the task to achieve goals, 2) Individual responsibility is the key to group success, 3) Face-to-face interaction activities provide beneficial synergies, the essence of this synergy is to appreciate differences, see strengths, and fill in each other's weaknesses, 4) Communication between members really needs to be explored to encourage and enrich the learning experience, foster mental and emotional development, 5) Evaluate the group process to determine the level of participation and cooperation of each member, help each other and listen or give advice to one another.

The teacher's role in cooperative learning as a facilitator, moderator, organizer and mediator is clearly visible (Bore, 2015). In this condition, the roles and functions of students are visible, the involvement of all students will be able to provide an active atmosphere and learning seems democratic, and each student has a role and will provide his learning experience to other students.

Conclusion

Based on the results and discussion of the study, it can be concluded that there is a significant difference in student learning activity in the experimental class taught with the Teams Games Tournament type cooperative learning model assisted by Wordwall Quiz (learning activity value 79.2; very high criteria) compared to the control class through the application of direct learning models on the solar system material (learning activity value 65.2; moderate criteria) and there is a significant difference in student learning activity in the class that applies the Teams Games Tournament type cooperative learning model assisted by Wordwall Quiz (learning outcome value 78.4; completed/meets standard 70) compared to the direct learning model (learning outcome value 57.3; not completed/does not meet standard of 70).

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