International Journal of Social Science and Human Research

ISSN (print): 2644-0679, ISSN (online): 2644-0695

Volume 07 Issue 05 May 2024

DOI: 10.47191/ijsshr/v7-i05-113**,** Impact factor- 7.876

Page No: 3397-3401

Implementation of A Collaborate Learning Model Stad-Pjbl with Diorama Media to Improve Student Learning Outcomes on Eclipse Topics

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ABSTRACT: During the implementation of the sixth grade science learning process at SDN 01 Karyomukti, it showed that the majority of students had low learning outcomes. This is due to lack of motivation among students, lack of enthusiasm, lack of enthusiasm and tend to be inactive. Low response to feedback from students to questions and teacher explanations and poor concentration of thinking. To solve problems in order to improve student learning outcomes and student collaboration is to apply the STAD-PjBL collaborative learning model assisted by diorama media which can involve the active role of students.

This research employed an experimental methodology designed to examine the effects of specific treatments under controlled conditions. The research utilized a non-equivalent control group design. Both the control and experimental groups underwent a pretest. Different treatments were applied to each group, followed by a posttest to evaluate outcomes. The subjects comprised 16 sixth-grade students from SDN 01 Karyomukti (experimental group) and 13 sixth-grade students from SDN 02 Karyomukti (control group).

The pretest and posttest results revealed a significant improvement in the experimental group, with an average increase of 75% using the STAD-PjBL collaborative model assisted by diorama media. Consequently, it can be concluded that the STAD-PjBL collaborative model assisted by diorama media is effective in enhancing the learning outcomes for eclipse topics in the sixth grade at SDN 01 Karyomukti.

KEYWORDS: collaborative learning model, STAD-PjBL, learning outcomes

I. INTRODUCTION

During the process of implementing the science learning process for class VI SDN 01 Karyomukti, it showed that the majority of students had low learning outcomes. This is due to lack of motivation among students, lack of enthusiasm, lack of enthusiasm and tend to be inactive. Low response to feedback from students to questions and teacher explanations and poor concentration of thinking. Based on the results of observations and analysis of learning outcomes carried out in sixth grade SDN 01 Karyomukti, the problems faced in learning include: (1) Lack of variation in learning models. (2) Students' interest and motivation to learn is low. (3) Low student learning outcomes on solar system material.

The above problems cause less than optimal student learning outcomes in sixth grade SDN 01 Karyomukti, especially the content of science lessons. Data on student learning outcomes in daily assessments shows that science is the lesson content with the lowest average when compared to other lesson content in thematic learning. With satndart minimum 67, there were 14 out of 16 students who did not complete. So the completion percentage is only 13%. The results of the analysis show that most students answered incorrectly on the eclipse material

Researcher collaborating the STAD (Student Team Achievement Division) learning model with PjBL (Project Based Learning) to overcome this problem. STAD is a cooperative learning model that encourages students to learn in groups with diverse members (Kasuma, 2023). The STAD model emphasizes activities and interactions between students to motivate each other and help each other master the material. The PjBL model is a learning model that uses projects/activities as media. Students will carry out exploration, assessment, interpretation, synthesis and information to produce various forms of learning outcomes (Sumarni, 2020).

Apart from learning models, learning media are also needed that can support improving learning outcomes. Based on these results, it is necessary to make efforts to improve learning to improve science learning outcomes, one of which is by implementing learning media. According to Arsyad, learning media are graphic, photographic or electronic tools that capture, process and reconstruct information (Rahmawati, 2021). In connection with the opinion above regarding media in the learning process, the researcher used visual media, namely diorama media.

Based on the background above, researchers are interested in conducting research at SDN 01 Karyomukti, with the title "Implementation of The STAD-PJBL Collaborative Learning Model With Diorama Media to Improve Student Learning Outcomes on Eclipse Topics"

II. LITERATURE REVIEW

A. Student Teams Achievement Division (STAD

STAD is one of the simplest cooperative learning models, developed by Robert Slavin at John Hopkin University, and is a good approach for teachers who are new to implementing cooperative learning models in the classroom (Widyani, 2022). STAD is a collaborative learning strategy that emphasizes interaction between students, motivating and supporting each other to master the material and achieve maximum results (Anwar et al, 2022).

The STAD type cooperative learning model is a cooperative learning approach that emphasizes activities and interactions between students to motivate each other and help each other master the subject matter in order to achieve maximum achievement (Kittur, 2021). STAD has 4 principles, namely: 1) The principle of positive interdependence; 2) Face to face interaction (face to face promotion interaction); 3) Participation and communication (participation communication); 4) Evaluate the group process..

B. Project-Based Learning (PjBL)

Grant (Sarwi, 2019: 45) states that PjBL is a student-centered learning model for carrying out in-depth investigations on a topic. Project-based learning or what is called project-based learning (PjBL) is an effort to change learning that has been teacher-centered into student-centered learning (Guo, 2020)

Project-based learning is an innovative learning model or approach, which emphasizes contextual learning through various complex activities. PjBL is the use of projects as a learning model. Projects place students in an active role, namely as problem solvers, decision makers, researchers, and document creators (Hindun & H. Husamah, 2019).

C. Diorama as Media and Learning Tools

According to Gerlach and Ely, in general, media are people, materials, or events that create conditions enabling students to acquire knowledge, skills, or attitudes (Setiawan, 2021). Thus, teachers, textbooks, and the school environment are considered media. Learning media are those that carry messages or information with instructional purposes or teaching intents. Learning media include physical tools used to deliver teaching content, such as books, tape recorders, cassettes, video cameras, video recorders, films, slides (pictures), photos, images, graphics, televisions, and computers.

A diorama is a static display with a three-dimensional foreground and a flat background to create a realistic scene (Putra, 2021). The foreground typically includes a landscape with models of people, animals, vehicles, equipment, or buildings. The background might be a photograph, drawing, or painting. Dioramas are usually enclosed in a box with the sides providing a background. The back corners or the entire back may be rounded to give the illusion of depth, and light can be added for special effects. Dioramas are typically designed to represent events and scenes from the past or present (Rusdi, 2022).

D. Learning Outcomes

Learning is a dynamic process through which individuals undergo behavioral transformations, influenced by their interactions with the environment (Khasna, 2022). It is an essential aspect of human development, facilitating qualitative shifts in individual behaviors. All accomplishments and activities in life stem from the process of learning, which is inherently active and integrative, employing diverse methodologies to attain specific objectives.

The outcomes of learning encompass authentic demonstrations of students' competencies, spanning attitudes, knowledge, and skills cultivated through classroom instruction. Assessment procedures are seamlessly integrated into the instructional process, ensuring authenticity and alignment with learning objectives.

III. METHOD

This study is an experimental research. Experimental research is defined as a method used to investigate the effect of certain treatments on others under controlled conditions. As a part of quantitative methods, this approach has distinctive characteristics, particularly the presence of a control group. This research uses a quantitative approach, involving data and statistics.

The research design employed is the non-equivalent control group design. According to Sugiyono (2013:116), the non-equivalent control group design is similar to the pretest-posttest control group design, except that in this design, both the experimental and control groups are not selected randomly. Both the control and experimental classes undergo an initial test. The treatment for the two groups is different, and the study concludes with a final test for each group.

The subjects of this research consist of 16 sixth-grade students from SDN 01 Karyomukti as the experimental class, and 13 sixth-grade students from SDN 02 Karyomukti as the control class. The main subjects of this research are the sixth-grade students of SDN 01 Karyomukti.

Research variables are elements that are subject to observation in a study, often referred to as factors influencing the research or phenomena being investigated. The independent variables in this study are the learning model and diorama media. The dependent variable is the students' learning outcomes on the topic of eclipses. The control variables include the students' initial knowledge level, learning motivation, and learning environment.

IV. RESULT AND DISCUSSION

The researchers innovatively combined the Student Team Achievement Division (STAD) model with Project-Based Learning (PjBL) to address learning challenges at SDN 01 Karyomukti. STAD is a collaborative learning strategy that emphasizes student interaction, mutual motivation, and support to master the material and achieve optimal results (Anwar et al., 2022). If effectively implemented, this principle can activate students, thereby enhancing their learning outcomes.

The STAD learning model has its limitations, as it primarily involves group discussions without practical application, whereas students need concrete experiences for meaningful learning. To address this issue, the researchers collaborated it with the Project-Based Learning (PjBL) model. PjBL is a learning model that employs projects as the primary instructional method. Projects engage learners in active roles as problem solvers, decision-makers, researchers, and documenters (Hindun & H. Husamah, 2019).

The STAD and PJBL learning models share the common goal of facilitating active student engagement through group learning. The researcher collaborated the STAD-PJBL learning model to optimize the learning process, with the following integrated instructional steps:

Phase 1: Communicating learning objectives and motivating students.

During this phase, the teacher articulates the learning objectives to be attained. This instructional session comprises six defined educational goals: (1) elucidating the precise mechanisms underlying lunar and solar eclipses, (2) delineating the accurate definitions of umbra and penumbra, (3) proficiently elucidating the diverse manifestations of lunar and solar eclipses, (4) discerning lunar and solar eclipses with precision, (5) proficiently crafting rudimentary eclipse projects, and (6) effectively reporting the outcomes of eclipse projects.

Phase 2: Formulating fundamental questions.

In this phase, the teacher provides stimuli in the form of questions related to the learning material. The teacher presents fundamental questions to the students regarding solar eclipses, such as: (1) Have you ever witnessed an eclipse? (2) When does an eclipse occur? (3) What are the differences between a solar eclipse and a lunar eclipse? (4) Let's gather information about solar eclipses

Phase 3: Presenting information.

The teacher disseminates information from various learning sources regarding the material. The information is conveyed through a PowerPoint presentation containing eclipse-related content, instructional videos, and prepared diorama media. Students observe and actively engage with the diorama media to comprehend the processes involved in eclipses.

Phase 4: Organizing learning groups.

The teacher and students form small learning groups, with each group consisting of 4-5 students. Together, they engage in discussions to formulate the problem they aim to solve, which in this learning context involves creating an eclipse project.

Phase 5: Designing project plans.

In this phase, the teacher and students collaboratively plan the project they will undertake together. Students receive a worksheet distributed by the teacher to guide them in creating the eclipse project. They prepare the necessary tools and materials for producing the project. Within each group, students work together to create the eclipse project.

Phase 6: Establishing project schedules.

The teacher and students engage in discussions regarding the timeline for completing the project. Together with the teacher, students reach an agreement on the time allocated for completing the project. Each group is given 45 minutes to finish their project.

Phase 7: Guiding and monitoring progress.

In this phase, the teacher guides the learning groups and monitors the progress of the project. The teacher circulates among each group to continuously monitor the project's development. The teacher provides guidance to students encountering difficulties**.**

Phase 8: Testing outcomes.

Students present their project outcomes to assess their success. Each group confidently showcases and presents their project in front of the class.

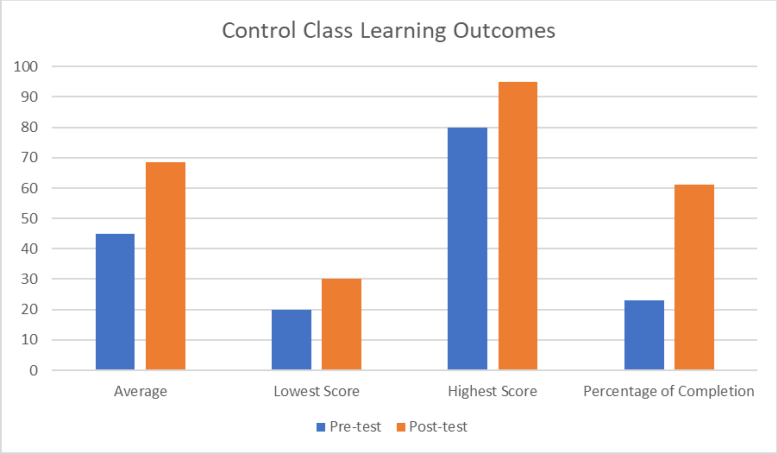
Phase 9: Evaluation.

In phase 9, students and the teacher engage in reflection and evaluation of the learning outcomes. Students are asked to share their experiences during the product creation process. They receive feedback from the teacher regarding the presented reports (communication). The teacher provides an opportunity for students to ask questions.

Phase 10: Providing rewards.

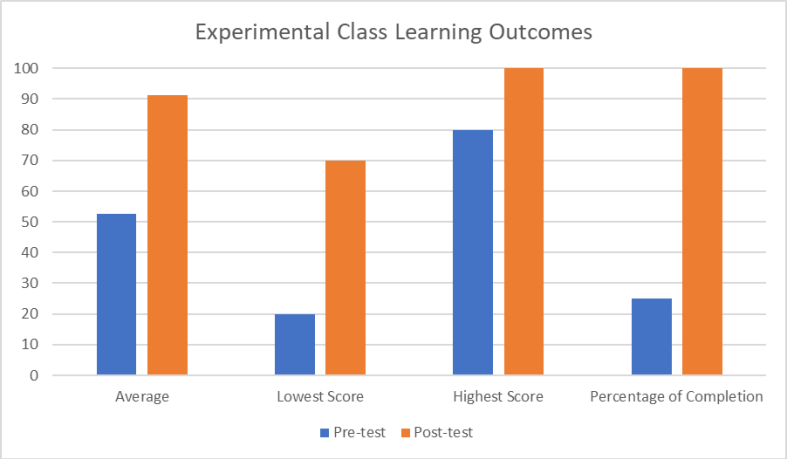
In this final phase, the teacher and students show appreciation to the groups that have presented by giving them a round of applause. The teacher praises all students.

The control class was conducted at SDN 02 Karyomukti with a total of 13 students. Learning utilized the STAD learning model with the same eclipse material. Learning outcomes were assessed through pretest and posttest evaluations. With a Minimum Mastery Criteria (KKM) of 68, the results of the pretest and posttest for the control class are as follows :



Based on the data above, it can be observed that the control class experienced a 38% increase using the STAD learning model. While the control class showed an increase in scores, it was not significant.

The experimental class was conducted at SDN 01 Karyomukti with a total of 16 students. Learning utilized the collaborative STAD-PJBL model assisted by Diorama media with eclipse material. Learning outcomes were assessed through pretest and posttest evaluations. With a Minimum Mastery Criteria (KKM) of 68, the results of the pretest and posttest for the experimental class are as follows:



Furthermore, based on the data provided, it is evident that the experimental class experienced a significant increase of 75% using the collaborative STAD-PJBL model assisted by diorama media. The improvement in scores observed in the experimental class was highly significant. And all of students reach the Minimum Mastery Criteria (KKM).

CONCLUSIONS

In conclusion, the research findings indicate that the STAD-PJBL collaborative model significantly enhances the learning outcomes of sixth-grade students at SDN 01 Karyomukti. The integration of diorama media depicting eclipses has proven to be an effective pedagogical tool for teaching the eclipse topic, facilitating a deeper understanding and retention of the material..

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