Application Of Project Based Learning (Pjbl) Model To Improve Students' Biology Learning Outcomes At Sman 2 Taliwang

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Abstract

The Implementation of the Project Based Learning (PjBL) Model in Improving Student Learning Outcomes in Biology at SMAN 2 Taliwang. Undergraduate thesis, Biology Education Study Program, Faculty of Teacher Training and Education, Cordova University. Supervised by Fitri Rahmawati, S.Pd., M.Pd. as the first advisor, and Siska Diah Ayu Permatasari, S.Pd., M.Pd. as the second advisor.This research aims to investigate the effect of the Project Based Learning (PjBL) model on students' learning outcomes in Biology at SMAN 2 Taliwang. Problems observed in biology learning include low academic achievement, the dominance of lecture methods, and a lack of active student participation. This study used a quantitative approach with a quasi-experimental design in the form of a pretest-posttest control group. The sample consisted of two classes: an experimental class applying the PjBL model and a control class using conventional teaching methods. The instrument used was a learning outcome test that has been validated and proven reliable. Data analysis included normality test, homogeneity test, and two-way ANOVA.The findings showed a significant difference in student learning outcomes between those taught using PjBL and those with conventional learning. The significance value was 0.004 (< 0.05), with a mean gain score difference of 110.767. Therefore, the PjBL model is proven effective in improving students' cognitive learning outcomes on the topic of viruses.

Keywords: *Project Based Learning, learning outcomes, biology, quasi-experiment, virus topic*

INTRODUCTION

Education is an important factor in forming superior human resources, including in Biology learning which has complex characteristics and requires a deep understanding of scientific concepts. Based on initial observations at SMAN 2 Taliwang, it was found that student learning outcomes in Biology subjects were still low, as seen from the achievement of scores that had not reached the KKM, especially in virus material. This is due to the dominance of lecture methods in learning and the low active participation of students.

Students have difficulty understanding abstract and complex materials, especially in high-level cognitive domains, such as the ability to analyze (C4), evaluate (C5), and create (C6). Learning tends to be teacher-centered, so it provides less space for students to think critically, collaborate, and relate Biology materials to real-life contexts.

As a solution to these problems, it is necessary to implement an innovative and participatory learning model. Project Based Learning (PjBL) is one model that can answer these challenges. This model focuses learning on projects related to real life, so that students can develop their knowledge and skills through direct experience. PjBL also encourages active involvement, collaboration, and critical and creative thinking skills.

The implementation of PjBL in Biology learning is expected to improve students' learning outcomes, both in cognitive, affective, and psychomotor aspects. This study focuses on virus material, which is considered suitable for project-based learning, one of which is through the creation of virus replicas from recycled materials. Therefore, this study was conducted to determine how much influence the PjBL model has on improving the learning outcomes of class X students at SMAN 2 Taliwang.

RESEARCH METHODS

This study uses a quantitative approach with a quasi-experimental method of pretest-posttest control group design. The subjects of the study were students of class X SMAN 2 Taliwang in the 2024/2025 academic year, consisting of 35 students in the experimental class and the control class. Data collection instruments include RPP, LKPD, and multiple-choice learning outcome test questions.

The instrument was validated by two experts with the validity results of the RPP of 88.88%, LKPD of 92.85% and the learning outcome test instrument of 93. 75%. All devices were declared very valid. The reliability of the device showed a value above 90%. Learning outcome data were analyzed using normality, homogeneity, and two-way ANOVA tests with the help of SPSS 25.

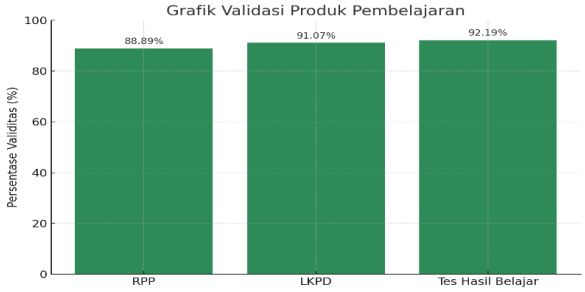
RESULTS AND DISCUSSION

The results of the analysis showed that there was a significant increase in learning outcomes in the experimental class compared to the control class. The average posttest in the experimental class reached 81.57, while the control class was 70.43. The affective and psychomotor aspects also showed an increase, where students were more active, collaborative, and creative in making the virus replica project.

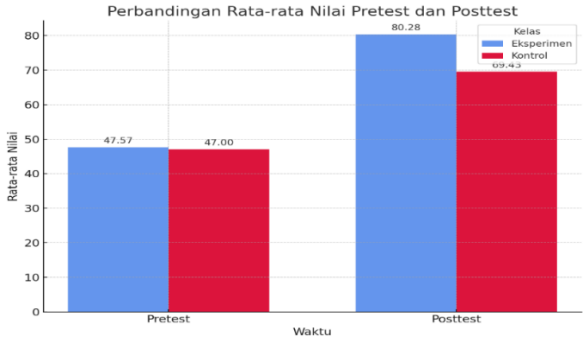
The results of the two-way ANOVA test showed a significance value of 0.004, which means that there is a significant difference in learning outcomes between the experimental and control classes. This shows that the implementation of the PjBL model is able to improve overall learning outcomes.

This improvement is supported by the characteristics of PjBL which provides space for students to be directly involved in the learning process. They not only understand the concept, but also apply it in the form of real projects, such as making a virus model from recycled materials. This makes learning more meaningful and contextual.

The research results are in the form of validation results by the validator, and a comparison graph of the average pre-test and post-test scores.



Learning product validation chart



Comparison chart of average pretest and post-test scores

CONCLUSION

The conclusion of this study shows that the Project Based Learning (PjBL) learning model is proven to be effective in improving the Biology learning outcomes of students at SMAN 2 Taliwang. This is shown through the results of the two-way ANOVA test which produced a significance value of 0.004 (<0.05) and a higher average posttest value for the experimental class compared to the control class. The application of PjBL provides a meaningful, contextual learning experience and encourages active involvement of students in understanding Biology concepts.

SUGGESTION

Suggestions from this study are addressed to several parties. For teachers, it is expected that they can apply the PjBL model in Biology learning as an effective alternative model to improve learning outcomes, as well as design projects that are relevant to students' daily lives. For schools, it is expected to support the implementation of PjBL learning through the provision of adequate facilities and teacher training. Meanwhile, further researchers are advised to test the effectiveness of this model on other aspects of learning outcomes and develop a combination of the PjBL model with other learning approaches in order to improve the quality of learning more optimally.

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58
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