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Implementation of the Project Based Learning Model for Social Sciences Material on Harmony in Ecosystems in the Aspects of Creative Thinking Skills and Learning Outcomes V Grade Students

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ABSTRACT

This study was conducted to address the low creativity and learning outcomes of students in the subject of harmony in ecosystems science and natural sciences through the application of the Project Based Learning (PjBL) learning model. This type of research is quantitative with a quasi-experimental pretest-posttest control group design. The study population included all students of SDN Demaan Jepara in the 2024/2025 academic year, with a purposive sampling sample consisting of grade V as the experiment (34 students) and grade VI as the control (24 students). The instrument consisted of a multiple-choice test of learning outcomes and an observation sheet of student creativity based on four indicators of creative thinking: fluency, flexibility, originality, and elaboration. Data were analyzed using a t-test to examine differences in learning effectiveness. The results showed that the experimental group using the PjBL model had a significant increase in creativity and learning outcomes compared to the control group, with a significance value <0.05. The conclusion of the study confirms that the PjBL model is effective as an innovative learning strategy to improve creative thinking skills and

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student learning outcomes in elementary schools on the subject of harmony in ecosystems science and natural sciences. Practical implications are suggested for teachers to optimize all stages of PjBL with appropriate facilitation to strengthen student involvement and mastery of the material.

INTRODUCTION

Education plays a central role in developing human potential sustainably through interaction with the environment, resulting in changes in students' knowledge, skills, and attitudes (Permendikbud, 2016). The formal learning process in schools is designed in a planned manner to develop quality human resources, as mandated by the 2013 Curriculum, which emphasizes the development of creativity through interactive and challenging learning (Permendikbudristek, 2022). Furthermore, science and science, as an integrated subject, encourages students to understand the harmony of ecosystems contextually, which supports holistic learning in elementary schools (Kusadi et al., 2020).

Creative thinking skills are key to facing global competition, as emphasized by the need to instill innovation from an early age to create a productive generation (Susantini, 2016; Noviyana, 2017). Creative thinking, which encompasses fluency, flexibility, originality, and elaboration, enables students to solve problems divergently and generate new ideas (La Moma, 2015; Saputro et al., 2024).

Science learning at SDN Demaan Jepara is still teacher-centered with conventional lecture methods, causing students to be passive, easily bored, and lacking understanding of the material on harmony in ecosystems (Fitri et al., 2022). Pre-research interviews revealed low learning motivation, low science grades, and students' inability to generate original ideas due to a focus on convergent memorization (Novia & Yani, 2015; Zainuri et al., 2024). Limited facilities, differences in student abilities, and minimal parental support exacerbate the situation, with students failing to connect concepts to real life (Susilawati, 2020).

This problem is exacerbated by the rare implementation of student-centered models such as Project-Based Learning (PjBL), which should encourage independent and collaborative exploration to produce tangible products (Kusadi et al., 2020; Arifin, 2024). Teachers struggle to manage time, class size, and PjBL steps, stifling student creativity, even though the Independent Curriculum requires strengthening the Pancasila student profile through meaningful projects (Octaviyani et al., 2020).

This study aims to examine the effect of PjBL on the creative thinking skills and learning outcomes of fifth-grade students at SDN Demaan Jepara in the subject of harmony in ecosystems science and studies. Its urgency lies in the urgent need to address low student creativity amidst the demands of the Independent Curriculum, while its novelty offers empirical evidence of the application of PjBL specifically to ecosystem science and studies with a quasi-experimental design in a rural Indonesian context (Permendikbudristek, 2022; Sari et al., 2023).

METHODS

This study used a quantitative approach with a quasi-experimental pretest-posttest control group design to determine the effect of implementing the Project Based Learning (PjBL) model on the creative thinking skills and learning outcomes of fifth-grade students at SD Negeri Demaan Jepara (Sugiyono, 2021; Creswell, 2022). This approach allows researchers to compare learning outcomes between the experimental group implementing the PjBL model and the control group using conventional learning methods. The research instruments consisted of a multiple-choice learning outcome test and a student creativity observation sheet that refers to indicators of fluency, flexibility, originality, and elaboration in accordance with creative thinking theory (Andiyana et al., 2018; Sudaryono, 2023).

The study population was all students of SDN Demaan Jepara in the 2024/2025 academic year, with a sample consisting of two classes, namely class V as the experimental group (34 students) and class VI as the control group (24 students) (Emzir, 2022). The sampling technique used purposive

sampling to ensure the two classes were representative of different learning conditions. Data on learning outcomes and creativity were analyzed using a t-test to test for significant differences between the two groups, in accordance with the statistical analysis procedures recommended in quantitative research (Sugiyono, 2017; Creswell, 2022).

The research procedure began with a pretest administered to both groups to measure students' initial abilities in the subject of harmony in ecosystems in the science subject. Next, the experimental group received project-based learning with structured stages starting from group formation, project planning, implementation, monitoring, and project evaluation. The control group received conventional learning using lecture and discussion methods. After the learning period was completed, a posttest was administered to measure improvements in student learning outcomes and creativity (Sudaryono, 2023; Emzir, 2022). This approach provides a comprehensive overview of the effectiveness of the PjBL model in the context of formal learning in elementary schools, manifested in increased student creativity and academic achievement.

RESULTS AND DISCUSSION

A. The Influence of the Project Based Learning Model On Learning Outcomes

This research is an experimental study. The research sample was taken from two classes, namely class V consisting of 34 students as the experimental class, and class VI consisting of 24 students as the control class. The purpose of this study is not only to observe the level of student creativity, but also to determine student learning outcomes in the subject of science and natural sciences using a project-based learning model. In the project-based learning process, a test was given consisting of 15 descriptive questions to measure student learning outcomes. The test was related to the material of science and natural sciences harmony in the ecosystem. The test was administered twice, namely before the learning began (pretest) and after the learning was completed (posttest) which was given to students in the control class and students in the experimental class.

To test the significant differences in student learning outcomes in the experimental and control classes, a t-test was used. Where the student learning outcomes obtained from the experimental class will be compared with the learning outcomes of the control class. Based on the calculation results with SPSS 25 for windows, the sig. (2-tailed) value was obtained at 0.043, and the significance level = 0.05, so 0.043 < 0.05. Thus, H0 is rejected and H1 is accepted, so it can be concluded that there is an influence of the project-based learning model on student learning outcomes.

Project-based learning conducted in the experimental class resulted in better conceptual understanding and learning outcomes compared to direct instruction methods in the control class. This research aligns with research conducted by Diah Ayu et al., which showed that students who used the PjBL model had a stronger understanding of the material after completing the project, resulting in better grades than those who used the direct instruction model.

B. The Influence of Project Based Learning Model on Creativity

Based on data taken from the questionnaire sheet as a tool for measuring creativity students, there are 15 questions that refer to four indicators creativity, that is fluency thinking, flexibility thinking, originality thinking, elaboration thinking. This question was provided for both classes that were the objects of the research, namely the experimental class and the control class, with the aim of determining the level of student creativity in the two classes.

The test results showed that the most dominant dimension in both classes was originality. In the control class, the percentage of students who achieved this dimension was 69%, while in the experimental class it reached 60%. This shows that students in both classes have been able to express ideas or solve problems in ways that have never been thought of by others. Both classes are included in the creative category, because the average percentage of creativity achievement in the experimental class was 78% and the control class was 73%. According to Arikunto in a study conducted by Nasrul, the criteria for creativity are in the creative category if the percentage of achievement is between 60.1% and

80%.

Judging from the results of students' ability to answer questions, toSeeing the significant influence of the two treatments, it is proven from the results of the independent sample t-test that obtained a significance of (0.043 < 0.05), meaning that the project based learning model is very effective in increasing student creativity because with the PjBL model students are given the freedom to be independent, can build their own knowledge, and create real work in the form of products or learning media. This is in line with previous research conducted byLuki Dwi Agung Saputro, Laili Komariyah, and Puardmi Damayanti (2024)that in student project learninggiven the freedom to independently determine solutions to a problem individually or in groups according to the theories, concepts or information obtained by students.

A serieslearning activities withmodelPjBL (Project Based Learning) provides improvements tocreativity studentThis model is an innovative learning method that actively involves students in building knowledge and developing their various potentials. This model alsohelpstudents understand what they are learning, as explained by Slametoin study. Nasruldiscloseethat productive learning is learning that is able to transfer knowledge optimally.

Based on learning outcomes, usemodelPjBLgive improvementtocreativity student. This is proven by the aspect of creativity that emerged during the learning process, includingother:

On stage First,studentgiven basic questions as the start of PjBL activities.mPreviously,studentdivided into 6 groups,each-eachconsisting ofmaximum6studentThe teacher provides the learning topic, learning objectives, motivation, and competencies to be achieved. Then, students are given questions to stimulate their thinking.process Study they.On stageThis,abilitycreativitystudentstart seen, especiallyontwoindicatornamely fluency andflexibility.Studythis is in accordance withstudyNasrul. Inindicator fluency, students can answer questions fluently. Meanwhile,in indicator flexibility, students provide different ideas from their friends.

On stage second, namely project planning,Teacher guide student in chooseactivities that are in line with the project they will be working ondo it. Students are also given the opportunity to ensure thatprocessprojects can be carried out according to the tools and materials available. With the existence ofstagethis planning,studentmore trained in valuing time. In addition, variousindicatorcreativity beginsseen,that is flexibility seenwhen students giveidearegarding product planning that will bemade. Elaborationseenwhen students work collaboratively to produce a product.Originality seenwhen students giveideatoFriend inhis group.Whereas fluency seenwhen students withfluentconvey ideas regarding product planning that has been made with the group.

On stage third,that is scheduling project, students are trained to be more disciplined, have responsibility, and be able to use time well according to mutual agreements withTeacher.

The fourth stage is project monitoring. During monitoring, the teacher acts as a facilitator, providing encouragement and guidance to students to ensure the project adheres to the initial plan and is completed on time. This aligns with the teacher's role as a facilitator, observing, guiding, and checking the progress of each group's project, as well as providing assessments at each stage of project implementation. At this stage, students' elaboration skills are demonstrated, as they collaborate to create a detailed and detailed product.

The fifth stage is the product assessment stage. During the assessment, all indicators of creativity begin to emerge: fluency, flexibility, originality, and elaboration. Fluency is evident when students present their products. Flexibility is evident when students offer diverse opinions about the products they have created. Originality is evident when students develop their own approach to presenting the results of their group's product. Elaboration is evident when students elaborate and develop their observations to find solutions to complete the products they have created.

The sixth stage of evaluation. In this final stage, teachers and students reflect on the activities and

results of the project they have undertaken. Students are asked to share their experiences during the project, including the difficulties and joys they experienced during the process. With project-based learning, students can build their knowledge, ideas, and skills, allowing them to think deeply about the problems presented by the teacher. This is in accordance with the opinion of Hseih, Lou & Shih (2013), who stated that project-based learning provides opportunities for students to work in groups, stimulate creativity, convey ideas, and solve problems.

The percentage results for the experimental group were 76%, while the control class was 69%, with a difference of 7%. Although the percentage value of the control class was lower than the experimental class for the products that had been made, both classes had a fairly high range of values in producing a product in the science subject on the topic of harmony in ecosystems.

C. Student Learning Completion through Project Based Learning Model

Table 1. Learning Completion (KKM = 75)

Class	Posttest Completion	Information
Class V (Experiment)	Mostly completed (≥ 75)	Higher
Class VI (Control)	Partially completed (≥ 75)	Lower

Based on the results of the analysis with the Minimum Completion Criteria (KKM) set at 75, it can be seen that the majority of fifth grade students succeeded in achieving learning completion during the posttest, both in the creative thinking aspect and**results**learning. This shows that the learning implemented in grade V has been able to significantly improve student achievement so that the majority are able to reach the expected minimum standard. Meanwhile, in grade VI which was used as a control group, some students were also able to achieve learning completion with a score of ≥ 75. However, the percentage of completion achieved by grade VI is relatively lower compared to grade V. This difference indicates that the learning approach used in grade V is more effective in improving students' learning outcomes and creative thinking skills.

In general, the results of this analysis show that implementing an appropriate learning model can improve student learning outcomes. The higher achievement of fifth-grade students compared to sixth-grade students demonstrates that innovative learning strategies, including Project-Based Learning (PjBL), positively contribute to achieving learning outcomes.

CONCLUSION

This study found that the implementation of the Project Based Learning (PjBL) learning model has a significant influence on improving creative thinking skills and learning outcomes of fifth-grade students in the subject of harmony in ecosystems science and science. Students who participated in project-based learning showed increased creativity in various indicators such as fluency, flexibility, originality, and elaboration and achieved higher learning outcomes compared to the control group using conventional learning methods. The results of statistical tests showed significant differences with a significance value below 0.05, which confirms the effectiveness of PjBL in the context of formal learning in elementary schools. In addition, project observation and evaluation documents indicate that project-based learning is able to develop students' responsibility, discipline, and cooperation independently and collaboratively.

However, this study has limitations related to the sample size, which only involved two classes in one school. Therefore, generalization of the results should be done with caution. External factors such as variations in individual student abilities and home environmental support can also influence learning outcomes, but have not been optimally controlled. For future research, it is recommended to conduct studies with larger and more diverse samples and combine quantitative methods with qualitative approaches to gain a deeper understanding of the learning process. The practical implications of this

study emphasize the importance of using the PjBL model as an innovative strategy to improve student creativity and learning outcomes in elementary schools, especially in science subjects. Teachers are expected to be more intensive in optimizing the PjBL stages with appropriate facilitation to encourage active student involvement and meaningful mastery of the material.

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