

# Effectiveness of Project-Based Learning Model on Improving Critical Thinking Skills and Student Creativity

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## Abstract

The purpose of this study was to test (1) the effectiveness of the application of the project-based learning model on improving critical thinking skills (2) the effectiveness of the application of the project-based learning model on improving student creativity skills. The subjects used in this study were students who took the class B media script writing course at the Yogyakarta State University Educational Technology Study Program in the 2023/2024 academic year. This research is a quasi-experimental type of research with a one group pretest-posttest scheme design. Data on students' critical thinking skills and creativity were obtained using a questionnaire before and after the application of the project-based learning model in lecture activities. Data on critical thinking skills and student creativity were then tested using paired samples t test. The results of the paired samples t test found critical thinking ability and creativity each showed a value of 0.00. In this study, it can be concluded that (1) the application of the project-based learning model is effective in improving students' critical thinking skills (2) the application of the project-based learning model is effective in improving students' creativity.

*Keywords:* project-based learning model, critical thinking, creativity.

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## 1. Introduction

The world of education continues to adapt to technological developments and the times. The existence of technology that is increasingly sophisticated and easily accessible makes information conveyed quickly (Fuldiartman et al., 2023). The Indonesian government made changes to the curriculum to keep up with the times and the demands that exist. The applied curriculum must be adapted to the rapidly changing times (Hendra et al., 2023). Students need to have the skills to adapt to the demands of a rapidly changing era (Ekaputra & Widarwati, 2023). The role of teachers in delivering active and meaningful learning is needed (Haryanto et al., 2023).

Observations in the field show that students' critical thinking skills and creativity in solving problems are still low. Factors that can lead to low critical thinking skills and student creativity are the application of learning models that are less varied, so that learning becomes less meaningful. Therefore, an effort is needed to improve students' critical thinking skills and learning activities, which in this study was carried out by applying a project-based learning model. The application of learning models can make student creativity increase (Ekaputra, 2023).

The application of the project-based learning model provides work opportunities in the form of projects so that it involves students directly (Maudi, 2016). The involvement of students in learning directly can make learning meaningful (Sanova et al., 2022). Quality improvement can occur because the project-based learning model is student-centered so that student competence increases. The project-based learning model makes students the center of attention in learning activities (Andrini et al., 2019).

Based on the description of the background that has been explained, this research problem will focus on the application of the project-based learning model to improve students' critical thinking skills and creativity. This objective is carried out to test (1) the effectiveness of the application of the project-based learning model on improving critical thinking skills (2) the effectiveness of the application of the project-based learning model on improving student creativity.

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## 2. Literature Review

### 2.1. Project-based learning model

The project-based learning model is a learning model that emphasizes the product of the project carried out and the activeness of students in learning activities (Zega, 2021). Through the application of the project-based learning model, students will seek the truth of the material collaboratively with (Wahyuni & Fitriana, 2021). The decrease in potential learning loss will be proportional to the increase in learning outcomes through the application of a learning model that involves students directly (Ekaputra & Sanova, 2023). The stages in the project-based learning model are determining the project to be carried out, determining the steps in solving the project, determining the project work schedule, implementing and monitoring the project carried out, making reports and evaluating the project that has been carried out (Angraini & Wulandari, 2021).

### 2.2. Critical Thinking

Critical thinking is a person's ability to think to assess the circumstances found (Egok, 2016). The ability to think critically must be owned by someone to solve the problems faced (Nuryanti et al., 2018). The ability to think critically owned by students in learning can reduce errors in completing the project given, so that the results obtained in learning can be maximized and the right conclusion (Kurniawati & Ekayanti, 2020).

### 2.3. Creativity

Creativity is the ability to think about something in a new and unusual way and give birth to a unique solution to the problem at hand (Astuti & Aziz, 2019). Student creativity does not mean having to create something completely new, but can also combine ideas / ideas that are already owned to be applied into something different from what has existed before (Zakiah et al., 2020). Environment is one of the factors that determine a person's creativity (Amrullah et al., 2018). With the application of the project-based learning model that is able to activate students, it is expected to increase learning activities.

## 3. Research Method and Materials

This type of research is a quasi-experimental research. The subjects in this study were students of class B media script writing in the Educational Technology Study Program at Yogyakarta State University in the 2023/2024 academic year. This study measured critical thinking skills and creativity through the application of the project-based learning model. Based on this, students' critical thinking skills and creativity are the dependent variables, while the application of the project-based learning model is the independent variable in this study. Data on students' critical thinking skills and initial learning creativity were obtained using a questionnaire filled out by students before using the project-based learning model. The results of critical thinking ability and initial creativity of students were tested for normality to determine the distribution of critical thinking ability and creativity of the sample class. The sample class is declared normal if the normality test obtained is greater than 0.05. After the application of the project-based learning model, students filled out a questionnaire regarding critical thinking skills and final creativity. After the critical thinking ability and final creativity were obtained, a hypothesis test was conducted using paired samples t test to determine the effectiveness of the project-based learning model on improving students' critical thinking ability and creativity. The application of the project-based learning model is effective in improving students' critical thinking skills and creativity if the paired samples t test results show a significance value smaller than 0.05.

## 4. Results and Discussion

The first stage carried out in this study was to collect data on students' critical thinking skills and learning creativity. Initial data on critical thinking skills and creativity were obtained using a questionnaire. Students filled in the initial ability questionnaire before learning using the project-based learning model. Data on critical thinking ability and creativity before the application of project-based learning model are presented in Table 1.

**Table 1.** Critical Thinking Ability and Initial Creativity

Variable	Value
Critical Thinking	67.40
Creativity	65.80

The critical thinking ability and creativity of students before the lecture using the project-based learning model were below the score of 70. The project-based learning model that emphasizes projects and products from the projects given is expected to improve students' critical thinking ability and creativity. Students are given the freedom to find solutions to projects and problems faced. The results of students' initial critical thinking skills and creativity were tested for normality to determine the distribution of critical thinking skills and creativity of the sample class. The results of the normality test on the data of critical thinking ability and initial creativity are presented in Table 2.

**Table 2.** Normality Test

Variable	Significance Value	Description	Conclusion
Critical Thinking	0.189	> 0,05	Normal
Creativity	0.200	> 0,05	Normal

Based on the data in Table 2, critical thinking ability and initial creativity are normalized. This shows that the sample class has a normally distributed critical thinking ability and creativity, so it can be continued with the application of the project-based learning model. After the project-based learning model was applied to the lecture, students filled out the critical thinking ability and creativity questionnaire again. The final critical thinking ability and creativity questionnaire aims to determine the effectiveness of the project-based learning model applied. Data on critical thinking skills and creativity are presented in Table 3.

**Table 3.** Critical thinking and creativity data

Variable	Pretest	Posttest	Gain Skor
Critical Thinking	67.40	84.40	17.00
Creativity	65.80	82.60	16.80

Based on the data in Table 3, there is an increase in students' critical thinking skills and creativity after the application of the project-based learning model. Data on critical thinking skills and creativity were then conducted paired samples t test to determine whether or not there is a significant increase in critical thinking skills and creativity after the application of project-based learning model. After conducting a paired samples t test on critical thinking ability data, a significance value of 0.00 was obtained. The significance value obtained is smaller than 0.05, which means there is a significant increase in critical thinking skills after the application of the project-based learning model. The effectiveness of the project-based learning model on improving critical thinking skills is in line with research conducted by (Anggreni, 2019) which states that the project-based learning model is effective in improving students' critical thinking skills. The occurrence of increased critical thinking skills through the application of project-based learning models is due to the project-based learning model facilitating students in completing the projects given (Winarti et al., 2022). The improvement of critical thinking skills through the project-based learning model can be seen from the increase in learning activities (Sularmi et al., 2018). Increased student learning activities indicate high student involvement in learning activities (Ekaputra, 2022). One indicator of high activity in learning activities can be observed in discussion activities and presentations of projects that have been done (Ekaputra & Hasanah, 2021).

A significant increase in creativity is also found in this study after the application of the project-based learning model, a significant increase in creativity is evidenced by the significance value after a paired samples t test of 0.00. The increase in student creativity after learning using the project-based learning model is in accordance with research conducted by (Khoiri et al., 2016) which states that learning with a project-based learning model can increase student creativity. Increasing one's creativity is related to several factors such as the environment and learning motivation (Utami et al., 2022). The project that is done through the application of project-based learning model in learning activities will bring out creativity and critical thinking (Insyasiska et al., 2015).

Learning using project learning model is proven to involve students directly in learning activities. Therefore, in this study it can be concluded that (1) the application of project-based learning models is effective in improving students' critical thinking skills (2) the application of project-based learning models is effective in increasing students' creativity. The project-based learning model is the right learning model to improve critical thinking skills and

creativity, especially for students in the class B media script writing course in the Yogyakarta State University Educational Technology Study Program in the 2023/2024 academic year.

## 5. Conclusion

Learning using the project learning model is proven to involve students directly in learning activities. Therefore, in this study it can be concluded that (1) the application of the project-based learning model is effective in improving students' critical thinking skills (2) the application of the project-based learning model is effective in improving students' creativity skills.

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