

## The Effect of Project-Based Learning Method on Creative Problem-Solving in Students of the Entrepreneurship Study Program, Indonesian University of Education

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### ABSTRACT

**Keywords:**

Creative Problem Solving; Project-Based Learning; Start-up.

The effectiveness of learning is significant in preparing students' skills paradigms. This research aims to instill the influence of the Project Based Learning (PjBL) method on students' Creative problem-solving abilities in the context of entrepreneurship learning. This research focuses on Indonesian Education University Entrepreneurship Study Program students who have taken the Start-up course. Creative problem-solving skills are considered important in preparing students to face the demands of an increasingly complex world of work. The research method used is quantitative with a descriptive verification approach, and data collection is carried out through questionnaires. The results of the research show that project-based Learning (PjBL) has a significant influence on increasing creative problem-solving abilities in students of the Entrepreneurship Study Program at the Indonesian University of Education. This research shows that Project Based Learning significantly improves the quality of Creative Problem Solving for Entrepreneurship Study Program Students at Universitas Pendidikan Indonesia.



### Introduction

Education is an inseparable element of individual and community development. In understanding the complex learning process, various learning theories have been proposed, one of which is now the main focus, namely constructivism (Albar & Mastiah, 2022). This concept has significantly impacted the world of education, influencing curriculum design, teaching methods, and assessment. Scholars such as Jean Piaget, Lev Vygotsky, and Jerome Bruner contributed significantly to the development and understanding of constructivism.

According to (Almulla, 2020), constructivism describes knowledge as the result of a construction process. (Azizah & Santoso, 2023) explains that constructivism theory views learning as a process of cognitive development through observation and interaction. These critical concepts in constructivism theory are relevant to the goals of

entrepreneurial behavior (behavior entrepreneurship), as outlined by (Lapek, 2018), which states that entrepreneurship is the process of achieving goals by facing risks, with one of the critical processes to attain them is creative problem solving. Creative Problem Solving is an urgent need in the context of higher education (Simbolon & Koeswanti, 2020). This is due to the need for individuals who can face complex challenges in an ever-changing environment. Creative problem-solving is the ability to solve problems and the creative process of producing innovative and effective solutions. In this era of globalization, where new challenges arise daily, individuals with Creative problem-solving skills will have a significant competitive advantage (Putra, 2018).

The Creative Problem-Solving learning model, which is focused on teaching and problem-solving skills, has become a significant highlight in the educational context. This concept is reinforced by (Sarifa, Wardani, Sulistyaningsih, & Purniawati, 2021), who defines Creative Problem Solving as a systematic technique to organize creative ideas to solve problems. Creative Problem Solving is also a cognitive process that involves creative thinking in facing and solving problems. (Mitchell & Walinga, 2017) state that creative Problem-solving consists of a thought process that produces new and innovative solutions. Indicators of Creative Problem Solving include the ability to think divergently, which is the ability to make various ideas or solutions, and the ability to think convergently, which is the ability to select and develop the most effective and practical ideas or solutions.

In higher education, developing Creative problem-solving skills is significant because students must face complex challenges in the growing world of work. At its core, Creative Problem Solving is considered a critical competency in entrepreneurship. Experts such as (Falah, Fauziyah, & Nurfitriya, n.d.) assert that entrepreneurial competence includes creativity, risk-taking courage, adaptation to change, and initiative.

In the context of the object of this research, students of the Entrepreneurship Study Program at the University of Education Indonesia are considered to have problems with problem-solving abilities. Many students have difficulty facing and solving problems in creative and innovative ways. The object of the study was reinforced by the results of Pre-Test data conducted by researchers with an average value of Creative Problem Solving indicators below average, such as lack of experience in dealing with situations that require Creative Problem Solving, lack of knowledge about Creative Problem Solving techniques, and lack of confidence in.

Generating new ideas is the main factor that affects the low problem-solving ability of students of the Entrepreneurship Study Program, Universitas Pendidikan Indonesia. The following questionnaire data evidence the results of these data:

**Table 1**  
**Pre-test data results on the level of Students Creative problem-solving ability**

<b>Variable</b>	<b>Dimension</b>	<b>% Score</b>	<b>Category</b>
	Problem analysis	53,44%	Low
	Effectiveness of arguments	50,39%	Low

<b>Pre Test Creative Problem Solving</b>	Development of theory to make it more massive	49,98%	Very Low
	Interested in problem-solving challenges	51,65%	Low
	Teamwork	51,69%	Low
	The effectiveness of problem-solving ideas/strategies	51,41%	Low
	<b>AVERAGE</b>	<b>51,42%</b>	<b>Not good</b>

Source: Questionnaire data processed by researchers (2023)

In addition, several studies have identified factors that affect the ability to solve creative problems. According to Cho & Lin (2010), such factors include intrinsic motivation, self-confidence, broad domain knowledge, and collaboration. In addition, (Suryanto, Degeng, Djatmika, & Kuswandi, 2021) added that a supportive learning environment, active teaching methods, and student involvement in projects relevant to their field of study can also affect Creative problem-solving abilities.

Previous research has shown a positive relationship between applying the Project Based Learning (PjBL) method and improving students' Creative problem-solving skills. Research conducted by (Jalinus, Syahril, & Nabawi, 2019) shows that students who learn through Project Learning (PjBL) have better problem-solving skills than those who learn through conventional teaching methods. Therefore, by identifying the Project Learning (PjBL) method, it is hoped that this research can significantly contribute to understanding the influence of learning methods on students' Creative problem-solving abilities, especially the Entrepreneurship Study Program at Universitas Pendidikan Indonesia.

The Project Based Learning (PjBL) learning method is used in this context to test the effect of Creative Problem Solving. The Ministry of Education and Culture (2013) defines Project Based Learning (PjBL) as a learning model that utilizes media projects or activities, allowing students to explore, assess, interpret, and apply their creativity in presenting their work, often in start-ups. Shows that project-based Learning (PBL) allows students to improve their knowledge and skills. Thus, this approach facilitates learning and encourages developing skills relevant to the entrepreneurial context.

Based on the background, the formulation of the problem of this study is "What is the level of Creative problem-solving ability in students of the Entrepreneurship Study Program, Universitas Pendidikan Indonesia before and after the implementation of the Project Based Learning (PjBL) method?" and "Is there a significant influence between the implementation of the Project Based Learning (PjBL) method on the ability of Creative Problem Solving in students of the Entrepreneurship Study Program, University of Education Indonesia?". This study aims to determine the extent to which the Project Learning method can affect the Creative problem-solving ability of students of the Entrepreneurship Study Program at Universitas Pendidikan Indonesia and to provide

recommendations to educational institutions regarding effective learning strategies in developing students' problem-solving skills. This research is necessary because the results can be the foundation for developing curriculum and learning methods that are more effective in improving the quality of education in the Entrepreneurship Study Program and preparing students to face challenges in the increasingly complex world of work.

## Research Methods

This research uses quantitative research methods with descriptive and verification approaches. The descriptive approach is used to see the picture of creative problem-solving before. After using the project-based learning method of students of the Entrepreneurship Study Program, Universitas Pendidikan Indonesia, and the verification approach is used to measure the influence of the Project Based Learning (PjBL) method on the development of Creative Problem Solving in students of the Entrepreneurship Study Program, Universitas Pendidikan Indonesia.

The object of this research is 64 students of the Entrepreneurship Study Program, Universitas Pendidikan Indonesia, Class of 2022, who have taken the Start-up course. Through sampling techniques using the Slovin test, it was determined that the samples in this study would be 55 students. The research data was collected through observations of the learning course in the Business Startup (Start Up) course and questionnaires about Creative Problem Solving. The detailed stages of this research are as follows:



**Figure 1**  
**Stages of Research**

This study hypothesizes that implementing the Project Learning (PjBL) method aligns with the ability to solve creative problems in students of the Entrepreneurship Study Program of the Indonesian University of Education. There is a significant influence between implementing the Project Learning (PjBL) method and the ability to solve creative problems in students of the Entrepreneurship Study Program of the Indonesian University of Education.

## Results and Discussion

### Test Instrument Data

Data analysis using SPSS software showed that the Significance (2-tailed) value on the total questions was  $< 0.005$ . In addition, the comparison between the r-calculated value and the r-table value, by looking at the Pearson correlation, which is greater than the r-table value, shows a result of 0.268 from a total of 52 data with a significance level of 0.05. These results indicate that validity tests, both through Significance (2-tailed) and Pearson correlation, confirm that the data used in this study can be considered valid.

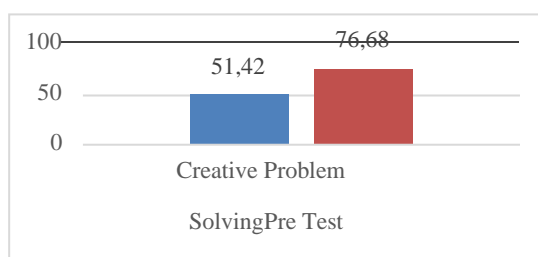
The results of the analysis of the implementation of Project Based Learning (PjBL) in Creative Problem Solving also managed to process all 52 questions efficiently based on the analysis of both datasets. Reliability evaluation using Cronbach's alpha statistics, concerning Imam Gozali's book, which sets a minimum value of 0.8, shows that all processed data meet the standards of validity and reliability. With an alpha value that reaches or exceeds this threshold, the results of this study can be considered valid and trustworthy for further research processes.

Overview of Creative Problem Solving Before and After Project-Based Learning Implementation Based on the questionnaire results in this study, the research sample consisted of 55 4th semester students in the Entrepreneurship Study Program of the Indonesian University of Education. These samples have attended the Start-up course for one semester using the Project Based Learning learning method. It is known that all samples, as many as 100%, fill out questionnaires both at the pretest and posttest stages to test the level of Creative Problem Solving students.

**Tabel 2**  
**Profil Responden**

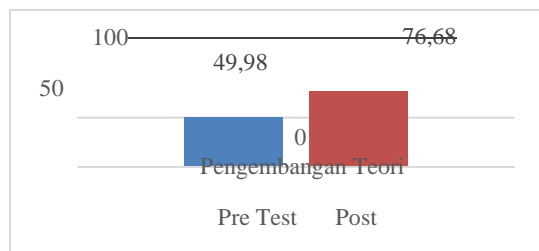
Profil	Klasifikasi	Jumlah Responden	Persentase (%)
Kelas	A	29 responden	55,7%
	B	23 responden	44,3%
Usia	17-20 tahun	52 responden	100%

Project Based Learning (PjBL) offers a project-centered learning approach where students are actively involved in real projects that allow them to solve complex problems. Implementing the Project Learning (PjBL) method to improve creative problem-solving skills in the Entrepreneurship Study Program students, Universitas Pendidikan Indonesia shows significant results based on the following figure.

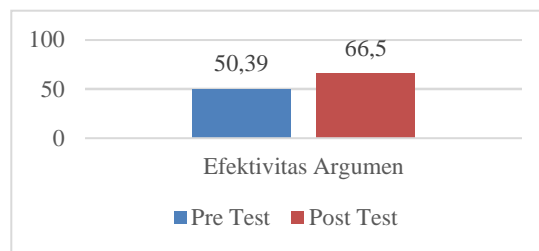


**Gambar 2**  
**Hasil PreTest dan PosTest Creative Problem Solving**

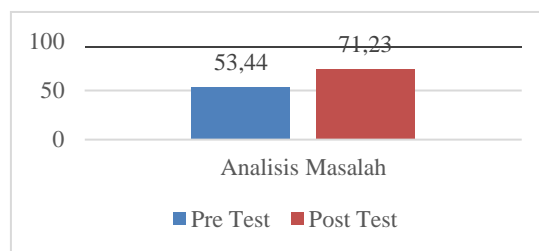
Based on the analysis of pre-test and post-test data carried out on students of the entrepreneurship study program in 2022, it can be concluded that there is a significant increase in creative problem-solving by 25.26%. Berikut adalah nilai sebelum dan sesudah menggunakan metode pembelajaran project based learning (PjBL) pada indikator penunjang variabel creative problem solving.



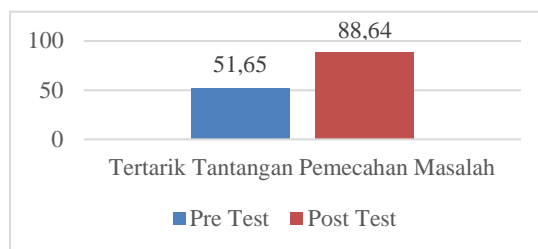
**Figure 3.**  
**PreTest Results and PosTest Dimension Analysis Problem**



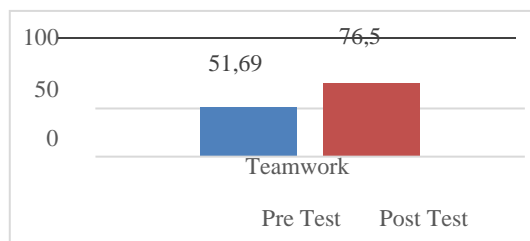
**Figure 4.**  
**PreTest Results and PosTest Dimensions of Argument Effectiveness**



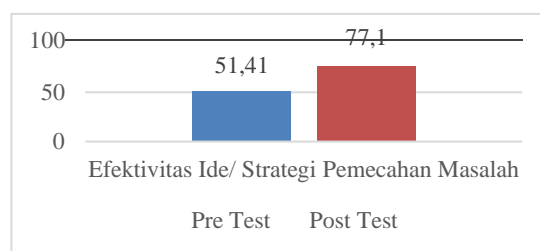
**Figure 5.**  
**PreTest and PosTest Results Dimensions of Theory Development**



**Figure 6.**  
**PreTest Results and PosTest Dimensions Interested Problem-Solving Challenges**



**Figure 7.**  
**PreTest and PosTest Results Teamwork Dimensions**



**Figure 8.**  
**PreTest and PosTest Results Dimensions of Effectiveness**  
**Problem-Solving Ideas / Strategies**

### **Pengaruh Project Based Learning Terhadap Creative Problem Solving**

Implementing Project Based Learning (PjBL) in Creative Problem Solving involves a normality test to ensure the distribution of variables used. Good-quality regression models require a normal distribution of variables. The normality test uses the Kolmogorof-Smirnov Test, where if the significance test result exceeds the value of 0.05, then the data is considered normally distributed. The evaluated data came from the pretest and posttest, resulting in two significance values. From both sources, there is confirmation that all 52 data have been processed correctly. In addition, the value of Asymp. Sig. (2-tailed) > 0.05 indicates that the data in this study were usually distributed. Thus, it can be concluded that the data are classified as expected when tested with residual normality tests.

Implementing Project-based Learning (PjBL) in creative problem solving also involves testing classical assumptions as a first step before conducting linear regression analysis. This stage is carried out to ensure that the regression coefficient is unbiased, consistent, and has estimation accuracy. This test consists of two stages, namely the multicollinearity test and the heteroskedasticity test, carried out on two data sets: pretest and posttest data. Analysis of both data sets showed that there was no problem of multicollinearity between the independent variables. This can be observed from each independent variable's high tolerance value and the low inflation variance factor (VIF). Therefore, it can be concluded that the results of this test are reliable and provide a clear understanding of how the independent variable affects the dependent variable in the absence of significant multicollinearity problems. Furthermore, the results of the heteroscedasticity test showed that there was no clear pattern of these data points. This indicates that the regression model does not experience symptoms of heteroscedasticity, which means there is no significant interference in this regression model, as evidenced by a significance value greater than 0.05 or 5%.

From the research data obtained, it can be concluded that the adjusted R Square, an indicator of coefficient of determination testing, shows a significant increase between the pretest and posttest. Adding project-based learning method variables to the model can significantly increase the model's ability to explain the observed variations in creative problem-solving variables. In other words, the project-based learning method was able to explain the relationship and its effect on creativity problem solving by 55.4%; other

variables, including intrinsic motivation and self-confidence, influenced the remaining 44.6%.

The ANOVA test is used to evaluate the success of the research model by setting the significance level below 0.05 or 5%. The analysis results showed a significance value of 0, indicating the success of this research model. From these results, it can be concluded that variable X, namely Project Based Learning (PjBL), has a significant influence on improving students' Creative Problem Solving abilities. This is evidenced by a positive beta value on variable X, which shows a strong positive impact.

This study implemented the project-based learning (PjBL) method as the primary learning strategy. The results showed that Project Learning (PjBL) has a significant influence on improving Creative problem-solving skills in students of the Entrepreneurship Study Program, Universitas Pendidikan Indonesia. This is consistent with research that states that project-based learning can stimulate creativity and problem-solving in learners. The project-based learning (PjBL) implementation process is carried out in structured steps. First, project topics relevant to the field of entrepreneurship are jointly selected by lecturers and students. After that, students are divided into small teams responsible for completing the project. In each team, students are encouraged to identify complex problems in the context of the project and develop strategies to solve those problems. Project-based Learning (PjBL) allows students to learn actively through hands-on experience by completing realistic assignments and getting continuous feedback from lecturers and team members.

Data analysis shows a significant influence of Project Based Learning (PjBL) on improving students' Creative Problem Solving. The results showed that the Creative Problem Solving scores of students involved in learning using Project Based Learning (PjBL) were significantly higher than those involved in conventional learning. This indicates that Project Based Learning (PjBL) effectively improves students' ability to identify, analyze, and solve problems in entrepreneurship creatively.

The analysis also supported the findings by highlighting the positive experiences experienced by students during the learning process using Project Based Learning (PjBL). Students report feeling more motivated and actively engaged in learning when using this approach. They also emphasize the importance of direct involvement in real projects to develop their creative problem-solving skills.

According to (Sejati, Isaeni, & Saptono, 2021), collaborative learning in the context of projects allows students to develop higher-order thinking skills through social interaction and exploration of complex problems. This finding also aligns with social constructivists who emphasize the importance of authentic learning contexts in improving students' understanding and skills.

Several factors also influence the effectiveness of project-based Learning (PjBL) in improving creative problem-solving. One of them is the design of the project itself. This research shows that well-designed projects that provide relevant challenges and allow space for students to explore tend to improve their creative problem-solving skills more



effectively. This goes hand in hand with instructional design that emphasizes crafting exciting and meaningful projects for learners.

Another influencing factor is the support from the supervisor. Lecturers who can provide appropriate direction, provide constructive feedback, and encourage collaboration between students can strengthen the positive effect of Project Based Learning (PjBL) on Creative Problem Solving, which is in line with the concept of mentoring, which emphasizes the critical role of mentors in supporting student skill development.

Based on these findings, there are several relevant implications for higher education curriculum development and learning practices. There needs to be greater emphasis on integrating Project Based Learning (PjBL) methods in curriculum design. Thus, students can often engage in project-based learning to improve their Creative Problem-Solving skills.

Furthermore, training and capacity building are needed for lecturers to design and support the implementation of project-based Learning (PjBL), with an understanding of the principles of effective project design and the ability to provide supportive guidance for students. Creating a learning environment that supports collaboration and exploration is also important.

Although this study provides valuable perspectives on the effect of Project Learning (PjBL) on Creative Problem Solving, there are some limitations, such as this research was only conducted on students of the Entrepreneurship Study Program at one university, so generalizing the findings needs to be done carefully. Furthermore, this study focuses more on the short-term effects of Project Learning (PjBL) on Creative Problem Solving, so longitudinal research is needed to understand the long-term impact. For future research, it is recommended to expand the scope of the sample and involve additional variables such as learning motivation and student learning style. In addition, comparative study, among other learning methods, can also provide a better understanding of the relative advantages of project-based Learning (PjBL) in improving Creative Problem-Solving.

## **Conclusion**

The conclusion can be drawn Based on this study's research results and discussion. There are differences in pretest and posttest scores in the research process, where the Pre-Test shows an average score of 51.42%; namely, the Student Creative Problem Solving level is still low. Meanwhile, after the Post-Test, administered to students using the Project Based Learning method, there was a significant increase of 76.68%.

The Project Learning (PjBL) learning method significantly influences the ability to solve creative problems in the Entrepreneurship Study Program, Universitas Pendidikan Indonesia students. This confirms that learning that focuses on hands-on experience substantially benefits developing students' creative skills. However, successfully implementing Project Based Learning (PjBL) requires proper project design and support from competent supervisors. By recognizing these factors, the Entrepreneurship Study

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Program can continue to improve the effectiveness of its learning in preparing students to face the challenges of the increasingly complex world of entrepreneurship.

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