



The Effect of Project-Based Learning on Students' Creativity, Learning Motivation, and Critical Thinking Skills

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Abstract

Education plays an important role in preparing students to face the challenges of the 21st century that demand critical, creative, and adaptive thinking skills. This study analyzes the effect of the Project Based Learning (PjBL) model on creativity, learning motivation, and critical thinking skills of students in the Social Studies subject at the junior high school level. The method used is a quantitative approach with a Quasi Experimental Nonequivalent Control Group Design. The research subjects consisted of two classes, namely the experimental group of 32 students who received project-based learning, and the control group of 33 students who learned through conventional methods. The instruments in the form of questionnaires and observations were analyzed using the Independent Sample T-Test to compare the results before and after treatment. The results showed that PjBL had a significant effect on increasing creativity, learning motivation, and critical thinking skills with a significance value of 0.000. This model is able to create contextual, collaborative learning experiences, and demands active student involvement in solving real problems.

Keywords: Project Based Learning, Creativity, Learning Motivation, Critical Thinking Skills, Social Studies.

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INTRODUCTION

مقدمة

Education plays a fundamental role in shaping students to face the increasingly complex challenges of the future. This aligns with the view that education is not merely the transfer of knowledge but also a means of holistic self-development (BP et al., 2022). Law No. 20 of 2013, Article 1, paragraph 1, emphasizes that students in schools must actively improve their abilities on an ongoing basis (Setiyana et al., 2022). The educational process is always closely linked to structured learning activities carried out in schools (Tasci, 2015). In the 21st-century context, education is expected to emphasize not only cognitive aspects but also social, emotional, and collaborative skills. Therefore, relevant learning models are needed to realize these competencies.

The primary goal of 21st-century education is to equip students with critical, creative, communicative, and collaborative thinking skills. These skills are essential for students to be able to solve real-world problems in a contextual and relevant way to everyday life. According to Saavedra & Opfer (2012), 21st-century skills rely not only on theoretical knowledge but also on the ability to apply it in real-world situations. Contextual learning can train students to think logically, adaptively, and collaborate effectively. Teachers are required to create a learning

environment that fosters higher-order thinking skills. Thus, education produces not only knowledgeable students but also individuals who are ready to face change.

Social Studies (IPS) subjects at the junior high school level are integrative, interdisciplinary, and contextual. These characteristics make IPS a strategic platform for developing students' creativity, motivation to learn, and critical thinking skills. Social studies learning focuses not only on understanding concepts but also on their application in solving social problems in the surrounding environment. According to Supriatna (2019), IPS aims to develop active, critical, and character-based citizens. This drives the need for innovative learning methods that are aligned with social dynamics. Therefore, IPS has great potential in facilitating students in facing global challenges.

Creativity is a crucial indicator in the educational process because it is related to the ability to generate new and useful ideas. Marliani (2015) stated that creative thinking encompasses the ability to view problems from multiple perspectives and create innovative solutions. In a learning context, creativity emerges when students are given the freedom to explore and express ideas. According to Ardiani (2021), the use of digital media such as Canva can support the visualization of ideas and enhance student creativity. Creativity also plays a role in building students' confidence to innovate. Therefore, learning strategies that support creativity are essential.

Learning motivation is a supporting factor for successful learning that closely interacts with creativity. Amabile (2020) emphasized that intrinsic motivation has a strong influence on students' drive to think creatively. Intrinsically motivated students are more willing to try new things, while extrinsic motivation, such as rewards or praise, can strengthen learning behavior. According to Pratiwi & Santoso (2021), challenging and meaningful learning can increase student motivation. Yusuf & Permana (2023) also added that connecting material to everyday life increases the relevance and motivation of students' learning. Thus, motivation is key to successfully achieving student competencies in school.

Project-Based Learning (PjBL) is emerging as an innovative learning model relevant to the needs of modern education. According to Wulandari (2022), the implementation of PjBL encourages students to think originally, explore new ideas, and generate creative solutions to real-world problems. Sari & Nugroho (2023) add that students' freedom to determine project methods and outcomes fosters a variety of ideas that demonstrate high creativity. In addition to creativity, PjBL has also been shown to increase learning motivation through active student involvement in every stage of the project. Fitriani (2020) emphasizes that PjBL trains students to think logically and systematically in problem-solving. Thus, PjBL makes a positive contribution to the development of 21st-century skills.

Critical thinking is also an important competency that can be developed through PjBL. Qonita & Handayani (2023) define critical thinking as a metacognitive skill for logically validating information. According to Facione in Khaeruddin (2019), critical thinking involves interpretation, analysis, evaluation, inference, explanation, and reflection. Self-regulation. Kurniawan & Lestari (2023) demonstrated that students taught using Project-Based Learning (PjBL) achieved higher scores on critical thinking tests compared to those taught using conventional methods. Project-based learning enables students to develop arguments based on data and facts. This enables students to make informed decisions when addressing social issues.

The urgency of this research also aligns with national policies emphasizing mastery of 21st-century skills. The Ministry of Education and Culture (2018) emphasized the need for education that produces a creative, innovative, and critical generation. SMP Negeri 1 Tumpang,

the research location, faced challenges related to low student creativity, learning motivation, and critical thinking skills, based on initial observations. This condition is due to the continued dominance of conventional, teacher-centered methods. Therefore, the implementation of Project-Based Learning (PjBL) is expected to be a strategic solution to improve the quality of social studies learning at the school. This study aims to comprehensively analyze the implementation of Project-Based Learning (PjBL) on students' creativity, learning motivation, and critical thinking skills.

METHOD | منهج

This research method uses a quantitative approach with a quasi-experimental design (Quasi-Experimental Design) type of Nonequivalent Control Group Design, which compares the experimental class with the Project Based Learning (PjBL) model and the control class with conventional learning. The saturated sampling technique was used because the population was less than 100 students, so all students of class VIIB (32 students) and VIIC (33 students) of SMP Negeri 1 Tumpang in the 2024/2025 academic year were sampled (Arikunto, 2010). The research data consisted of primary data in the form of questionnaire results on creativity, learning motivation, and critical thinking skills of students, as well as secondary data from literature related to PjBL and research variables. Data collection instruments included a Likert scale questionnaire and observations of student engagement, which have been tested for validity and reliability (Mulyadi, 2023; Ennis, 2021). Data analysis began with normality tests (Shapiro-Wilk/Kolmogorov-Smirnov) and homogeneity tests (Levene's Test), then continued with an Independent Samples T-Test using SPSS 22 to test the average difference between the two groups. Decisions were made based on a Sig. (2-tailed) value < 0.05 as an indication of a significant effect.

RESULT | نتائج

a. Student Creativity

Table 1. Descriptive Creativity Data Before Treatment

Class	MIN	MAX	AVERAGE
Experimental	54	66	58,97
Control	53	64	58,67

Source: Data processed by researchers, 2025

Table 2. Descriptive Creativity Data After Treatment

Class	MIN	MAX	AVERAGE
Experimental	60	70	65,66
Control	53	65	60,18

Source: Data processed by researchers, 2025

Table 3. Differences in Student Creativity in the Control and Experimental Classes

Class	Treatment		Change
	Before	After	
Experimental	58,97	65,66	6,69
Control	58,67	60,18	1,52

Source: Data processed by researchers, 2025

Based on the descriptive data, the average creativity The average creativity score of the experimental class before the treatment was 58.97 and the control class 58.67, so both were at a relatively balanced level. After implementing Project-Based Learning (PjBL), the average creativity score of the experimental class increased to 65.66, while the control class with conventional learning only reached 60.18. This increase of 6.69 points in the experimental class,

compared to 1.52 points in the control class, indicates that PjBL has a stronger positive influence on student creativity. This finding indicates that the project-based approach is able to stimulate students' creativity, imagination, and originality more optimally than traditional methods.

b. Learning Motivation

Table 4. Descriptive Data on Learning Motivation Before Treatment

Class	MIN	MAX	AVERAGE
Experimental	61	75	65,78
Control	58	72	65,61

Source: Data processed by researchers, 2025

Table 5. Descriptive Data on Learning Motivation After Treatment

Class	MIN	MAX	AVERAGE
Experimental	68	78	74,03
Control	65	74	70,15

Source: Data processed by researchers, 2025

Table 6. Differences in Student Learning Motivation in the Control and Experimental Classes

Class	Treatment		Change
	Before	After	
Experimental	65,78	74,03	8,25
Control	65,61	70,15	4,55

Source: Data processed by researchers, 2025

Before the treatment was administered, students' learning motivation The average scores in the experimental and control classes were relatively similar, with averages of 65.78 and 65.61, respectively, making them suitable for comparison. After implementing the Project-Based Learning model, the experimental class's motivation increased to 74.03, higher than the control class's score of 70.15. The difference in motivation in the experimental class reached 8.25 points, compared to only 4.55 points in the control class, indicating that students learning with the project approach were more motivated because they were actively involved in the learning process. Thus, Project-Based Learning has been shown to be more effective in encouraging student engagement, responsibility, and motivation than conventional methods.

c. Critical Thinking Skills

Table 7. Descriptive Data on Critical Thinking Skills Before Treatment

Class	MIN	MAX	AVERAGE
Experimental	88	102	94,91
Control	87	100	94,42

Source: Data processed by researchers, 2025

Table 8. Descriptive Data on Critical Thinking Skills After Treatment

Class	MIN	MAX	AVERAGE
Experimental	101	110	106,12
Control	93	109	100,94

Source: Data processed by researchers, 2025

Table 9. Differences in Critical Thinking Skills between Control and Experimental Classes

Class	Treatment		Change
	Before	After	
Experimental	94,91	106,12	11,21
Control	94,42	100,94	6,52

Source: Data processed by researchers, 2025

Students' critical thinking skills before the treatment showed a relatively balanced condition between the experimental class with an average of 94.91 and the control class with 94.42, thus ensuring the validity of the group separation for experimental purposes. After implementing the Project-Based Learning (PjBL) model, the experimental class's average critical thinking skills increased to 106.12, while the control class only achieved 100.79. The difference

in increase of 11.21 points in the experimental class compared to 6.52 points in the control class indicates that PjBL is more effective in promoting higher-order thinking skills. These results confirm that project-based learning contributes positively to the optimal development of students' critical thinking skills.

d. Instrument Test Results

Table 10. Normality Test Results

Result	Class	Shapiro-Wilk		
		Statistic	df	Sig.
	Creativity	,969	65	,107
	Motivation	,970	65	,119
	Creative Thinking Ability	,971	65	,127

Source: Data processed by researchers, 2025

Based on the SPSS version 25 output results shown in Table 4.8, the normality test conducted using the Shapiro-Wilk test showed a significance value greater than 0.05. Therefore, based on the decision-making criteria explained previously, it can be concluded that the questionnaire data in the experimental and control classes were normally distributed.

The homogeneity of variance test was conducted to ensure that the questionnaire data obtained from different groups had equal variance. This test is important for valid subsequent statistical analyses, such as One-Way ANOVA. The homogeneity of the questionnaire data, both before and after treatment, is presented in the following table:

Table 11. Homogeneity Test Results

Result	Levene Statistic	df	df1	df2	Sig.
	Based on Median	2,090	2	192	,127
	Based on Median and with adjusted	2,090	2	167,968	,127
	Based on trimmed mean	2,897	2	192	,059

Source: Data processed by researchers, 2025

Based on the table above, it can be concluded that the results of the homogeneity test for learning outcomes using the Homogeneity of Variances test in One-Way ANOVA showed a significance value of 0.052, with a significance level of $\alpha = 0.05$. According to Didin (2016:94), if the significance value is ≥ 0.05 , the variance between data groups is considered homogeneous. Thus, the results of this homogeneity test indicate that there are no significant differences in variance between data groups, meaning the data can be considered homogeneous.

e. Hypothesis Testing

Table 12. Independent Sample T-Test Results

Variable	Class	Treatment	Mean	T-test	Sig. (2-Tailed)	Description
Creativity	Experiment	Before	58,97	0,001	0,647	Tidak Signifikan
		Control	58,67			
	Control	After	65,66	9,229	0,000	Signifikan
		Control	60,18			
Motivation	Experiment	Before	65,78	0,016	0,830	Tidak Signifikan
		Control	65,61			
	Control	After	74,03	6,759	0,000	Signifikan
		Control	70,15			
Critical Thinking Skills	Experiment	Before	94,91	0,005	0,608	Tidak Signifikan
		Control	94,42			
	Control	After	106,12	6,541	0,000	Signifikan
		Control	100,94			

Source: data processed by researchers, 2025

Based on the results of the Independent Sample T-Test, significant differences were found between the experimental and control classes in the variables of creativity, learning motivation, and critical thinking skills. Student creativity increased significantly in the experimental class, indicating that project-based learning can stimulate creativity and active student engagement. In terms of motivation, students participating in Project-Based Learning (PjBL) experienced significant improvements because they felt more emotionally and cognitively engaged in the learning process. Meanwhile, critical thinking skills also developed more optimally in the experimental class, as Project-Based Learning (PjBL) provided students with the space to analyze, evaluate, and solve problems in greater depth. These findings confirm the effectiveness of Project-Based Learning (PjBL) as a relevant learning strategy to support 21st-century competencies.

DISCUSSION

مناقشة

a. The Effect of the Project-Based Learning (PBL) Model on Student Creativity

The average creativity score in the experimental class before the treatment was 58.97, while the average for the control class was 58.67, indicating that the two groups were relatively balanced before the treatment. After the treatment, a significant change was seen in the experimental class, with an increase of 65.66, while the control class experienced only a slight increase to 60.18. The 6.69-point increase in the experimental class, which far exceeded the 1.52-point increase in the control class, illustrates a significant transformation resulting from the implementation of Project-Based Learning (PjBL). This difference indicates that after the treatment, PjBL was able to create a more lively learning experience, stimulate creativity, and provide a wider space for creative expression for students compared to conventional learning methods. This change occurred because PjBL provided a learning experience that demanded active engagement, where students were encouraged to explore and find original solutions to real-life problems. The collaborative and flexible learning environment opened up space for students to express ideas independently and in groups, allowing for a more dynamic creative thinking process. Furthermore, the focus on creating tangible products encourages a deeper integration of knowledge, experience, and creative intuition. The t-test results, with a significance value of 0.000, reinforce evidence that active, contextual, and project-based learning experiences can significantly enhance students' divergent thinking capacity. Thus, the implementation of Project-Based Learning (PjBL) has proven effective as a stimulus for the growth of creativity in the learning process.

This finding aligns with research by Mustika and Salamah (2024), who stated that involvement in projects encourages students to explore various creative approaches to completing assignments. Students are not only given the freedom to express ideas but also challenged to translate them into concrete products. According to Damayanti and Putri (2023), the PBL model creates a learning environment conducive to the development of creativity through teamwork, open-ended problem-solving, and the creation of final products. This makes the learning process a more student-centered and empowering experience. PBL allows students to learn through direct action, rather than simply verbal instructions or memorization. Consequently, students become more skilled at expressing ideas, thinking alternatively, and embracing challenges. Therefore, creativity is not merely an outcome, but a process that is embedded in their daily learning. In conclusion, PBL is an appropriate approach to facilitate the sustainable development of student creativity.

b. Increasing Learning Motivation through the Project-Based Learning Model

Students' learning motivation in the experimental class before the treatment had an initial average of 65.78, while the control class showed an average of 65.61, indicating that both groups were at a relatively balanced starting point. After the treatment, there was a significant change in the experimental class, with an average increase to 74.03, while the control class experienced only a slight increase to 70.15. The 8.25-point increase in the experimental class, which far exceeded the 4.55-point increase in the control class, demonstrates the significant impact of Project-Based Learning (PjBL) implementation on student learning motivation. This difference reflects the characteristics of PjBL, which provides space for students to feel directly involved in the learning process through ownership of the projects they work on. This situation fosters a sense of responsibility and clear learning goals, encouraging students to complete tasks with enthusiasm and personal awareness. Learning that simultaneously combines cognitive and affective aspects strengthens students' emotional engagement with learning activities. Furthermore, successfully completing a project provides a positive experience that boosts self-confidence and a sense of meaningfulness in learning. The PjBL model also shifts students' roles from mere recipients of information to creators of knowledge, thus sparking curiosity and an internal drive to continue learning. Therefore, this difference in motivation scores reflects PjBL's ability to provide authentic learning experiences and encourage active student participation more optimally than conventional methods.

Research by Hanifah et al. (2025) found that students felt more responsible for assignments when they were given the freedom to manage and complete projects independently. The PBL model creates a meaningful learning environment, so students feel the learning is relevant to their lives. According to Khasanah et al. (2024), the integration of PBL into STEAM-based learning also increases intrinsic motivation, as students experience a sense of satisfaction when they see the results of their work become tangible. Furthermore, students become more confident because they experience the learning process themselves, rather than simply receiving information from the teacher. Presenting projects to the class also fosters a sense of pride and responsibility for their learning outcomes. PBL makes students feel valued and involved in the learning process, fostering intrinsic motivation. In the long term, this helps foster independent, focused, and persistent learning habits. Thus, PBL not only encourages cognitive achievement but also fosters a deep and sustainable drive for learning.

c. Effectiveness of the Project-Based Learning Model in Improving Critical Thinking Skills

Students' critical thinking skills in the experimental class before treatment had an average initial score of 94.91, while those in the control class had an average score of 94.42, indicating a relatively balanced initial score for both groups. After the treatment was implemented, the experimental class experienced a significant improvement, reaching an average of 106.12, while the control class only increased to 100.94. The 11.21-point increase in the experimental class, which far exceeded the 6.52-point increase in the control class, confirms the strong influence of Project-Based Learning (PjBL) implementation. This difference arises because the PjBL structure requires students to analyze information, identify problems, evaluate various alternatives, and make decisions based on rational arguments. The project-based learning process also requires students to apply concepts in complex contexts, training them to consider multiple perspectives, engage in critical discussion, and continuously reflect on their work. The t-test results, with a significance value of 0.000, confirm that the challenging, collaborative, and problem-solving learning environment in PjBL fosters systematic and logical thinking patterns that form the foundation of critical thinking skills. Therefore, the significant

improvement in the experimental class is a direct consequence of students' intellectual engagement in project-based learning.

These findings align with research by Widodo and Kurniawati (2023), which demonstrated that PBL strengthens students' critical thinking skills through exploratory activities and reflective discussions. Students are encouraged to question information, design data-driven solutions, and objectively evaluate project success. Furthermore, according to Putra et al. (2025), students involved in PBL tend to show improvements in constructing logical arguments and making rational, evidence-based decisions. They not only complete assignments but also understand the context and implications of their actions. This challenging and open learning environment is highly effective in fostering critical thinking skills. Students become more analytical, reflective, and able to defend opinions based on strong reasoning. This process is crucial in equipping students with the ability to navigate complex problems outside the classroom. Thus, PBL not only improves academic abilities but also prepares students to become independent thinkers in the information age.

CONCLUSION

خاتمة

Based on the analysis of the implementation of the Project Based Learning (PjBL) model at SMP Negeri 1 Tumpang, it was found that its implementation is still not optimal due to time constraints, curriculum pressures, conventional teaching habits, and a lack of training that hinders comprehensive adoption, although some teachers who have tried it have shown positive indications of student participation. The school's efforts through training and workshops are commendable, but more targeted mentoring strategies and internal policies are needed so that PjBL can be implemented consistently and become an established learning culture. In terms of learning outcomes, the implementation of PjBL has been proven to significantly increase student creativity, as shown by the striking difference in scores between the experimental and control classes, where students are encouraged to be more active in exploring, collaborating, and creating real works. In addition, this model also has a positive impact on learning motivation, because direct involvement in projects fosters a sense of ownership, responsibility, and intrinsic motivation that makes learning more meaningful and relevant to everyday life. Furthermore, PjBL is also effective in developing critical thinking skills through analytical experiences, problem solving, and rational decision-making that are practiced in collaborative and contextual situations. Thus, systemic and collaborative support from various parties is key to ensuring that PjBL is not merely a sporadic innovation, but truly becomes a relevant, sustainable learning strategy that is capable of preparing students to face the complexity of challenges in the global era.

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