International Journal of Geography, Social, and Multicultural Education
https://journal.unesa.ac.id/index.php/ijgsme

The Effect of Project Based Learning on Student's Social Science Learning Results Reviewed From the Student's Initial Ability

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Received: 19-05-2023
Accepted: 24-05-2024
Published: 01-06-2024
DOI: https://doi.org/10.26740/ijgsme.v2n1.p9-21
e-ISSN : 2987-9140
Volume : 2 No.1, (2024)
Page : 9-21

Abstract

This study aims to evaluate the effect of using Project Based Learning (PBL) approach on students' Social Studies learning outcomes, by considering students' initial ability as a relevant factor. The research method used is statistical analysis of student learning outcomes data divided into two groups, namely the group that applied PBL and the control group that used conventional learning methods. The results of the analysis showed that there was a significant difference in social studies learning outcomes between the two groups, with a significance value (sig.) obtained of 0.00 <0.05. This indicates that PBL has a positive impact in improving students' understanding of social studies material. In addition, there was also a significant difference in social studies learning outcomes based on students' initial ability, with a sig. of 0.00 < 0.05. However, there was no significant interaction between the application of PBL and students' initial ability in determining students' learning outcomes, as shown by the sig. value of 0.622 > 0.05. The results of this study provide an important contribution in understanding the effectiveness of PBL in improving students' social studies learning outcomes, as well as its implications for the development of more effective learning strategies in the future.

Keywords: Project Based Learning, Learning Outcomes, Students' Initial Abilities

1. INTRODUCTION

Education is one of the important aspects in the development of a nation. In the context of education, learning methods have a very significant role in shaping the quality of student learning outcomes. One of the increasingly popular learning approaches is Project Based Learning (PBL). PBL offers a project-oriented approach, where students are actively involved in completing collaborative projects relevant to the learning content.

The application of PBL has been the focus of research in recent years. Various studies try to understand more deeply the influence of PBL on student learning outcomes, including in the context of social studies learning. Looking through the recent literature, we can see an increasing interest in research that examines the impact of using PBL in social studies learning. For example, research by Hmelo-Silver (2017) investigated the process of collaborative knowledge construction in the context of PBL. The study provides valuable insights into how collaboration in PBL projects can enhance students' understanding of social studies learning materials. Likewise, the study by Thomas (2000) presents a thorough review of PBL-related research in recent years, providing a solid foundation for further understanding of this approach.

Project Based Learning (PBL) has become an increasingly popular learning method in contemporary education. This approach emphasizes project-integrated learning, where students are actively engaged in exploration, discovery and problem solving relevant to real

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life. In recent years, various studies have revealed the importance of PBL in modern learning contexts. In addition, Project Based Learning (PBL) has been the subject of increasing attention in education, particularly for its ability to develop critical thinking, collaboration, and problem-solving skills. In the modern educational context, where student engagement and the relevance of learning materials are becoming increasingly important, PBL offers an approach that fits the demands of the times.

There are several reasons why PBL has an important role in learning: Encourages Active Student Engagement: PBL engages students directly in projects that have direct relevance to real life. This encourages students' active engagement in learning, thus triggering intrinsic motivation to learn (Mergendoller & Thomas, 2017). PBL encourages students' active involvement in the learning process. They are not only recipients of information, but also knowledge makers through the exploration and application of concepts in the projects they work on (Blumenfeld et al., 2017).

Developing Critical Thinking Skills: In PBL, students are encouraged to solve complex problems, analyze information, and make evidence-based decisions. This process helps develop critical thinking skills that are essential for success in the real world (Jonassen, 2016). In PBL, students are exposed to real situations that require complex problem solving. This encourages them to develop critical and creative thinking skills in dealing with the challenges faced (Helle et al., 2018).

Encourages Collaboration and Communication: Through collaborative projects in PBL, students learn to work together in teams, share ideas, and communicate effectively. This prepares them for a work environment where collaboration and communication are key (Hung, 2015). PBL promotes cooperation among students in completing projects. Through collaboration, students learn to share ideas, resolve conflicts, and achieve common goals, which are important skills in the world of work and everyday life (Savery, 2015).

Provides a Relevant Learning Context: PBL places students in real situations where they have to apply the knowledge and skills learned in relevant contexts. This helps students understand the relevance of the learning material to everyday life (Thomas, 2020). In PBL, students integrate various concepts and skills from different subjects in the context of the project they are working on. This allows them to see the connections between various concepts and apply their knowledge holistically (Walker & Leary, 2019).

Developing Independence and Responsibility: In PBL, students have responsibility for their own projects, from planning to execution and evaluation. This develops students' independence and sense of responsibility for their work (Hmelo-Silver, 2017). Fosters Intrinsic Motivation: By giving students control over their learning and allowing them to explore topics that interest them, PBL can increase students' intrinsic motivation towards learning (Makitalo, Linnanen, Rasanen, & Korhonen, 2020).

Some previous studies that discuss the Effect of PBL on Understanding Science Concepts: Experimental Study in Senior High School Research by Nurhayati and Setiawan (Nurhayati & Setiawan, 2022) explored the effect of PBL implementation on the understanding of science concepts at the senior high school level. The results showed that students who learned through PBL had a better understanding of science concepts than students who followed conventional learning. Then, the Effectiveness of PBL in Improving Mathematics Problem Solving Skills

Study by Santoso and Prabowo (Santoso & Prabowo, 2021) discussed the effectiveness of PBL in improving elementary school students' mathematics problem solving skills. The results showed that PBL was effective in improving students' math problem solving skills.

Another study, Implementation of PBL in English Language Learning: Its Impact on Speaking Ability The study by Indriani (Indriani, 2020) investigated the impact of PBL implementation on students' speaking ability in English learning. The results show that PBL can significantly improve students' speaking ability. In addition, PBL as an Effective Approach to Improve Students' Creativity In their research, Wibowo and Susanto (Wibowo & Susanto, 2019) found that PBL is effective in improving students' creativity at the secondary school level. Students who engaged in PBL showed improvement in generating creative ideas and innovative solutions.

And finally, Implementation of PBL in History Learning: Its Impact on Students' Understanding and Engagement Research by Kusumawati (Kusumawati, 2018) evaluated the impact of PBL implementation in history learning on students' understanding and engagement. The results show that PBL not only improves students' understanding of history, but also increases students' engagement in learning.

Some theories that can be used as a foundation in PBL include Constructivism Theory: This theory emphasizes that students construct their own knowledge through direct experience with learning materials. In the context of PBL, students are actively engaged in projects that demand real problem solving, thus allowing them to build a deep understanding of the concepts learned (Hmelo-Silver, 2017).

Active Learning Theory: This theory suggests that effective learning occurs when students are actively involved in the learning process. With PBL, students are not only the recipients of information, but also the creators of knowledge through exploration, collaboration and reflection on projects (Jonassen, 2016).

Intrinsic Motivation Theory: This theory highlights the importance of intrinsic motivation in learning, which is the drive from within students to learn and achieve goals. PBL stimulates students' intrinsic motivation by giving them control over their own learning, challenging them with interesting and relevant tasks, and providing space for creativity and exploration (Deci & Ryan, 2016).

Collaborative Learning Theory: This theory emphasizes the importance of collaboration between students in the learning process. With PBL, students work together in teams to complete complex projects, expand their understanding through discussion and sharing of ideas, and develop social skills essential for success in the real world (Hung, 2015).

Student Engagement Theory: This theory highlights the importance of student engagement in learning to achieve optimal learning outcomes. PBL creates a learning environment that allows students to be actively involved in the completion of challenging and relevant projects, thereby increasing student engagement and supporting the achievement of learning objectives (Savery, 2015).

The study of students' initial abilities in the context of Project Based Learning (PBL) is important because understanding the level of students' initial knowledge and skills can help teachers design projects that match their level of understanding and ability. Research by

Kurniawan (Kurniawan, 2023) showed that an understanding of students' initial abilities is an important foundation in designing appropriate PBL projects. The results of this study revealed that students with diverse initial abilities require different approaches in project-based learning. In addition, research by Sari and Pramudya (Sari & Pramudya, 2022) highlighted the importance of initial assessment of students' abilities before implementing PBL. By understanding students' initial abilities, teachers can develop projects that are challenging but appropriate to their level of mastery of the learning material. This can increase the effectiveness of PBL in improving students' overall learning outcomes.

Then the study of student learning outcomes in the context of Project Based Learning (PBL) is an important thing to explore because PBL places emphasis on deep concept understanding and the development of critical thinking skills. Research by Rahayu (Rahayu, S., 2023) showed that students who engage in learning through PBL tend to achieve higher learning outcomes than students who follow conventional learning. This finding is supported by another study conducted by Wibowo and Susanto (Wibowo & Susanto, 2022), who found that PBL has a significant positive impact on students' academic achievement in various subjects. In addition, research by Fitriani and Hartono (Fitriani, & Hartono, 2021) highlighted that PBL can also improve students' ability to apply the knowledge and skills they learn in a real context. Thus, students' learning outcomes in PBL include not only better understanding of concepts, but also their ability to apply that knowledge in real-life situations.

With the growing literature on PBL, it is important that we continue to deepen our understanding of the effectiveness of this learning method, especially in the context of social studies learning. Therefore, this study aims to present a comprehensive background of the problem regarding the effect of using Project Based Learning on social studies learning outcomes by considering students' initial abilities by answering the problem formulation of whether there is a difference in social studies learning outcomes of students who learn using project based learning with students who learn conventionally, then whether there is a difference in learning outcomes based on students' initial abilities, and whether there is an interaction between the application of project based learning with students' initial abilities in determining student learning outcomes.

2. METHOD

This study will use a single-group pre-posttest-control experimental design. The control class will receive conventional learning, while the experimental class will receive learning with a Project Based Learning (PBL) approach. This design allows direct comparison between two classes in similar initial conditions before the intervention is carried out (Johnson & Johnson, 2014). The research was conducted in a junior high school, precisely MTs Miftahul Ulum, which is located in Lenteng District, Sumenep Regency.

The research sample will be randomly selected from the population of class VII students of MTs Miftahul Ulum. The sample size will be calculated based on statistical power analysis to ensure sample adequacy. In this study, there are 20 student samples distributed into two classes, namely the experimental class and the control class, each class has 10 students. The inclusion criteria will include class students who have diverse initial abilities in social studies (Muijs & Reynolds, 2011).

Data will be analyzed using two-way analysis of variance (ANOVA) to evaluate the effect of using PBL on social studies learning outcomes, with students' initial ability as a moderator variable. Post-hoc analysis will be conducted to compare differences between treatment and control groups. Regression analysis will also be conducted to evaluate the relationship between the independent variable, moderator variable, and dependent variable (Krajcik & Blumenfeld, 2006).

3. RESULT AND DISCUSSION

The importance of the study of Project Based Learning (PBL) in learning to learning outcomes in terms of students' initial abilities is very significant (Hidayati, 2020). Research by Pratiwi (Pratiwi, 2023) highlighted that understanding students' initial abilities allows teachers to design PBL projects that match students' level of understanding and skills. This can improve learning effectiveness as appropriately designed projects will challenge students without overloading them with tasks that are too difficult or too easy. Another finding by Susanto and Rahayu (Susanto & Rahayu, 2022) emphasized that PBL can help students with diverse initial abilities to achieve better learning outcomes. By applying the PBL approach, students have the opportunity to learn through projects that are challenging and relevant to real life, thus improving their understanding of learning concepts. Therefore, the study of PBL in the context of students' initial abilities is important to support the development of education that focuses on achieving optimal learning outcomes (Dock & Kogoya, 2023).

1. Planning

Project Based Learning is one of the learning methods launched by the Minister of Education, Culture, Research and Technology (Mendikbudristek) in the Merdeka Belajar Curriculum. The following are the steps of Project Based Learning (PBL) in learning:

The first step in PBL implementation is project planning. Teachers should plan projects that are relevant to the curriculum and take into account the needs of the students and the resources available (Thomas, 2017). After planning, the second step is the introduction of the project to students. Teachers should introduce the project clearly, explaining the goals, needs, and expectations associated with the project (Blumenfeld, Soloway, Marx, Krajcik, Guzdial & Palincsar, 2017). The next step is team formation. Students are divided into small teams that will work together in completing the project (Mergendoller & Thomas, 2017) .

After team formation, the next step is exploration and inquiry. Students are required to conduct research, gather information, and study materials relevant to their project (Hmelo-Silver, 2017). After gaining sufficient understanding, the fifth step is planning and designing solutions. Students plan strategies and design solutions to complete their project, often through discussions in teams (Savery, 2015).

The final step in PBL is project implementation. Students carry out their plans, work together in teams, and implement the solutions they designed (Walker & Leary, 2019). During the implementation process, the teacher acts as a facilitator who guides and supports students in completing their projects (Hung, 2015). Upon completion, the last step is evaluation and reflection. Students and teachers evaluate the project results, reflect on the learning process, and make improvements for future projects (Jonassen, 2016).

2. Implementation

This study utilized two classes with similar student numbers and learning achievements. Therefore, prior to the implementation of the test, a placement test was conducted for several classes to assess the suitability of the trial class. From the results of the placement test, a class with similar student characteristics and learning achievement was selected to be the pilot class.

From the data on learning outcomes for initial ability, a normality test is carried out, the following are the results of the normality test obtained:

Table 1. Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual for Learning outcames	.164	20	.166	.928	20	.139

a. Lilliefors Significance Correction

Based on the results of the normality test output which shows the results of the normality test, the significance result is 0.139. if sig> 0.05, then the residual value is normal, then sig. 0.139> 0.05 then the data is normal. After obtaining normal data, it is continued to carry out the two-way Anova analysis test, following the results of the homogeneity test as well as the two-way Anova analysis.

3. Students' Initial Ability

The initial ability of students is the ability that students already have before following the learning that will be given. This initial ability illustrates the readiness of students in receiving lessons that will be delivered by the teacher. In the context of education, students' initial abilities are very important because they affect students' ability to understand and recognize a given problem. Good initial ability can lead students to more easily understand mathematical problems that involve higher-level thinking skills (Susilowati, 2018).

Students' initial abilities can be categorized into ready-to-use initial abilities, ready-to-use initial abilities, and introductory initial abilities. To find out the characteristics and initial abilities of students, techniques include using records or documents, pre-requisite tests and initial tests, individualized communication, and questionnaires (Hamzah, 2023).

Table 2. Output Descriptive Statistics

Dependent Variable: Learning outcames				
Class	Initial Ability	Mean	Std. Deviation	N
Experiment class	High Initial Ability	84.60	5.899	5
	Low Initial Ability	76.00	4.183	5
	Total	80.30	6.617	10
Comtrol class	High Initial Ability	75.00	5.000	5
	Low Initial Ability	64.20	4.266	5
	Total	69.60	7.183	10
Total	High Initial Ability	79.80	7.223	10
	Low Initial Ability	70.10	7.385	10
	Total	74.95	8.678	20

The data above shows the average (means) of each variable in the experimental class. The mean value of learning outcomes for students with high initial learning ability in the experimental class is 84.60, indicating that students with good initial ability tend to achieve higher learning outcomes after attending the experimental class. In contrast, the mean score of students with low initial learning ability in the experimental class was 76.0, indicating that although there was an increase in learning outcomes after attending the experimental class, the results were still lower than students with high initial ability. This difference highlights the importance of initial ability in influencing student learning outcomes as well as the effectiveness of the teaching methods applied in the experimental class.

Meanwhile, the data on the control class shows the average value of student learning outcomes based on their initial learning ability. Students with high initial learning ability in the control class had an average score of 75. Meanwhile, students with low initial learning ability in the control class had an average score of 64.20. This data indicates that there is a significant difference in learning outcomes between students with high and low initial ability in the control class. It also shows that students' initial ability plays an important role in determining their learning outcomes, even without special treatment given as in the experimental class.Then the homogeneity test is carried out as follows:

Table 3. Output Levene's Test

		Levene Statistic	df1	df2	Sig.
Learning outcames	Based on Mean	.298	3	16	.826
	Based on Median	.296	3	16	.828
	Based on Median and with adjusted df	.296	3	14.729	.828
	Based on trimmed mean	.271	3	16	.845

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Learning outcames

*b. Design: Intercept + kelas + Initial Ability + Class * kemampuan_awal*

The data above is the result of Levene's Test of Equality of Error Variances. This test aims to test the null hypothesis that the error variances of the dependent variable, learning outcomes, are equal across groups. The table shows the test results based on four different methods: mean, median, median with adjusted df, and trimmed mean.

The Levene Statistic value based on the mean is 0.298 with degrees of freedom (df1) of 3 and df2 of 16, and a significance value (Sig.) of 0.826. Based on the median, the Levene Statistic value is 0.296 with df1 of 3 and df2 of 16, and a significance value of 0.828. When using the median with adjusted df, the Levene Statistic value remains 0.296 with df1 of 3 and df2 of 14.729, and a significance value of 0.828. Based on the trimmed mean, the Levene Statistic value is 0.271 with df1 of 3 and df2 of 16, and a significance value of 0.845.

All significance values (Sig.) shown are greater than 0.05, which means that the null hypothesis is not rejected. Thus, it can be concluded that the error variance of the dependent variable (learning outcomes) is the same across the tested groups. This research design includes the intercept, the effects of class, initial ability, as well as the interaction between class and initial ability. This result is important as it shows that there is no significant

difference in the error variance between the different groups, which supports the assumption of homogeneity of variance in the analysis of variance. Next, two-way ANOVA analysis obtained the following data:

Table 4. Output ANOVA Test

Dependent Variable: Learning outcames					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1048.950[a]	3	349.650	14.645	.000
Intercept	112350.050	1	112350.050	4705.761	.000
Class	572.450	1	572.450	23.977	.000
Initial Ability	470.450	1	470.450	19.705	.000
Class* Initial Ability	6.050	1	6.050	.253	.622
Error	382.000	16	23.875		
Total	113781.000	20			
Corrected Total	1430.950	19			

a. R Squared = .733 (Adjusted R Squared = .683)

From the results of data analysis, it was found that the significance value (sig.) obtained was 0.00, which is smaller than the specified significance level (0.05). This shows that there is a significant difference in the learning outcomes of Social Studies between students who learn using the Project Based Learning (PBL) approach and students who learn with conventional methods. This finding indicates that PBL has a positive impact in improving students' understanding and skills in learning social studies materials. Furthermore, the results of the analysis also show that the significance value obtained on the variable of students' initial ability is also 0.00, which is smaller than the value of the significance level set. This implies that there is a significant difference in students' social studies learning outcomes based on their initial ability. Thus, it can be concluded that students' initial ability has a significant effect on their learning outcomes in the context of social studies learning.

However, the analysis also shows that the significance value obtained on the interaction between PBL implementation and students' initial ability is 0.622, which exceeds the significance level value set. This indicates that there is no significant interaction between PBL implementation and students' initial ability in determining students' learning outcomes. Although there are differences in learning outcomes based on students' initial abilities, the effect of PBL on learning outcomes is not significantly influenced by students' initial abilities.

In this analysis, testing for between-subjects effects highlighted the importance of class factors and students' initial ability on learning outcomes. Although the interaction between the two was not significant, this study provides valuable insights for educational practitioners to understand and improve learning effectiveness. Thus, an in-depth understanding of how class and students' initial ability affect learning outcomes can help in designing more effective and targeted learning strategies. As a result, efforts to improve the quality of education can be directed more appropriately, providing greater benefits for students and society as a whole.

Project-based learning (PBL) is an instructional method that emphasizes learning through the completion of real-world projects, which actively engages students in solving complex, open-ended problems (Karan, & Brown, 2022). This approach contrasts with traditional learning methods that often focus on passive absorption of information (Quariach et al., 2023). In the context of social science education, PBL has shown promising results in improving students' understanding of socio-cultural, political, and economic issues, particularly when reviewed from the students' initial abilities.

The effectiveness of PBL on students' learning outcomes is often influenced by their starting point, i.e., their initial academic abilities (Wilder, 2015). Students with higher prior knowledge of the subject matter are likely to excel in PBL environments, as they have a better foundation to integrate new information and solve problems (Fitriani et al., 2020). However, the strength of PBL lies in its ability to cater to students with varying levels of prior knowledge, providing opportunities for all students to deepen their understanding and develop higher-order thinking skills such as analysis, synthesis, and evaluation.

For students with lower initial abilities, PBL can offer several advantages (Aksela & Haatainen, 2019). The hands-on, collaborative nature of PBL allows these students to engage with the subject matter in a more meaningful way (Golter et al., 2007). Through project work, they are encouraged to actively apply concepts, ask questions, and collaborate with peers, which can lead to improved retention and comprehension (McInerney & Fink, 2003). Furthermore, PBL fosters critical thinking and problem-solving skills, which are essential in social science learning. These skills can help students with lower initial ability to bridge gaps in their understanding and reach higher academic achievements.

PBL promotes social interaction, teamwork, and communication skills (Notari et al., 2014). These competencies are not only important in academic settings but also in real-world scenarios where collaboration and the ability to discuss complex issues are valued (Bates et al., 2022). For students with strong initial abilities, PBL presents an opportunity for further development of these skills and encourages them to take on leadership roles in project groups. Meanwhile, students with weaker initial abilities benefit from the collaborative learning environment, where peer support and guided discovery enable them to grasp concepts more effectively.

The role of the teacher in a PBL environment is also pivotal, particularly when students have diverse initial abilities (Marrisom et al., 2021). Teachers must scaffold the learning process, providing appropriate guidance and support tailored to the students' needs (Taber, 2018). This might include differentiating instruction, offering additional resources, or adjusting project complexity based on the student's initial ability levels. The teacher also plays an essential role in facilitating peer interactions, ensuring that students with lower initial abilities are integrated into the collaborative learning process and do not feel marginalized.

The impact of PBL on students' social science learning results is significant, as it not only improves their academic performance but also enhances their social skills, collaboration, and critical thinking (Maksum et al., 2021). However, for the approach to be fully effective, it is important that the learning activities are designed to be inclusive, recognizing and addressing the varying initial abilities of students (Almulla, 2020). Through this approach, all students,

regardless of their starting point, are provided with an equal opportunity to succeed, ensuring a more equitable educational experience.

PBL is an effective educational method that can positively influence students' social science learning outcomes, particularly when tailored to meet the needs of students with different initial abilities. It fosters deeper engagement, collaborative skills, and critical thinking, which are essential for success in social sciences and beyond. The adaptability of PBL makes it a valuable tool for improving educational outcomes for all students, especially when guided by thoughtful and responsive teaching strategies.

4. CONCLUSION

From the results of this study, it can be concluded that the use of Project Based Learning (PBL) approach has a significant impact in improving students' Social Studies learning outcomes. The findings show that students who learn using the PBL method have better social studies learning outcomes than students who learn with conventional methods. In addition, students' initial ability also affected their learning outcomes, with students who had low initial ability tending to experience greater improvement after applying PBL. However, there was no significant interaction between the application of PBL and students' initial ability in determining students' learning outcomes.

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