International Journal of Business, Law, and Education
Volume 3, Number 2, 2022

From Projects to Proficiency: How Project-Based Assignment Improve Student Understanding

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ABSTRACT
An assignment model in education refers to the framework or approach used to design, structure, and deliver tasks or assignments to students. This study explores the effectiveness of Project-Based Learning (PBL) in enhancing student understanding and proficiency. Over the course of a semester, 210 students in Universitas Negeri Jakarta from various disciplines were engaged in this research. Data were collected through assessment tests for two group of assignment model, namely PBL and Individual. The results showed that PBL significantly improves student understanding by promoting critical thinking, collaboration, and real-world application of knowledge. Students who participated in PBL showed greater retention of information and were more adept at applying concepts in practical scenarios compared to those who engaged in individual assignment models. These findings suggest that incorporating PBL into the curriculum can result in substantial improvements in student learning outcomes, making it a valuable pedagogical approach for educators

Keywords:
Assignment Model; Project-Based Learning; Individual Assignment; Student proficiency

INTRODUCTION

An assignment model in education refers to the framework or approach used to design, structure, and deliver tasks or assignments to students (Wiggins & McTighe, 2005). A well-designed assignment model helps structure the learning process, ensuring that assignments are aligned with educational goals. Project-Based Learning (PBL) as an assignment model is highly valuable in education because it offers a rich, dynamic approach to learning that promotes deeper understanding, skill development, and student engagement (DuVivier, 2003; Guskey, 2010).

PBL is an educational approach where students learn by actively engaging in real-world and meaningful projects. Instead of traditional learning methods that often rely on lectures and memorization, PBL encourages students to explore, research, and solve problems as they work on a project over an extended period (Lam, Cheng, & Ma, 2009). This method emphasizes active learning, critical thinking, and collaboration, helping students develop a deeper understanding of the subject matter. As we know that PBL engages students in active learning, requiring them to research, explore, and apply knowledge rather than just memorizing facts (Yeboah & Smith, 2016). This hands-on approach leads to a deeper understanding of the subject matter. This approach encompasses the specific methods, types of assignments, and strategies for evaluation that educators use to facilitate learning, assess student performance, and achieve educational objectives (Mulyasa, 2013). Project-based learning model as example of assignment model, where students work on a project over an extended period, applying multiple skills and knowledge areas to create a final product or solution.

PBL assignments often involve complex, open-ended problems that require students to think critically, analyze situations, and come up with creative solutions (Weimer, 2013). This process helps students develop robust problem-solving skills.

By working on projects with real-world applications, students can see the relevance of what they're learning, which helps solidify their understanding and retention of information. Students are tasked with making important decisions about how to approach and complete their projects, which enhances their ability to think critically and make informed choices. Working in groups teaches students how to manage responsibilities, delegate tasks, and collaborate effectively to achieve a common goal. This type of assignment is difference with an Individual assignment is a task or project that students are required to complete on their own, without collaboration with classmates. Individual assignment is designed to assess a student's personal understanding, skills, and abilities related to a specific topic or subject area. This assignment allows educators to evaluate each student's independent learning and progress.

This study aims to explore the impact of PBL on student understanding, particularly how it helps students move from basic knowledge acquisition to higher levels of proficiency.

METHOD

This research used a quasi-experimental design with independent sample t-tests to compare the effectiveness of project-based versus individual assignments on students' understanding (Wibawa, Mahdiyah & Afgani, 2022). Students in project assignment groups engaged in collaborative projects, while students in individual assignments focused on working independently, on the same topic.

To evaluate the impact of Project Based Learning on student comprehension, an independent sample t-test was conducted to compare comprehension scores between the project-based assignment and the individual assignment group. This statistical test was chosen because it is appropriate for comparing the mean proficiency scores of two independent groups (Mahdiyah, 2014). In addition, the pre-test scores were analyzed to ensure that both groups were equivalent in their initial understanding before the intervention.

The formula for calculating the t-value in an independent samples t-test is:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_2}}}$$

RESULTS AND DISCUSSION

The results of this study prove that the use of a comparison of assignment models between PBL and individuals, provides different knowledge scores as seen in the following table*:*

Table 1. Descriptive Statistics Group

	Assignment Model	N	Mean	Std. Deviation	Std. Error Mean
Understanding scores	Individual	120	12.97	1.772	.162
	PBL	90	13.61	2.272	.239

This table shows that Descriptive Statistics data in the PBL group (n = 90) have an average score of 13.61 (standard deviation = 2.27) and the individual group (n = 120) have average test scores of 12.97 (standard deviation = 1.77). This value indicated that the PBL assignment model has a higher lesson understanding score,

compared to the individual assignment model. This score indicate that students who follow the Project Based Assignment approach can understand the learning outcomes much better compared to those who receive individual assignments.

In accordance with the purpose of this study to ensure whether PBL assignments significantly improve students' understanding compared to individual assignments, it is necessary to conduct proof using hypothesis analysis. An independent samples t-test was conducted to compare the post-test scores of the PBL group and the individual based assignments group, as the following table.

Table 2. Independent Samples Test

			Understanding scores	
			Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F		5.717	
	Sig.		.018	
t-test for Equality of Means	t		-2.309	-2.230
	df		208	163.345
	Sig. (2-tailed)		.022	.027
	Mean Difference		-.644	-.644
	Std. Error Difference		.279	.289
	95% Confidence Interval of the Difference	Lower	-1.195	-1.215
		Upper	-.094	-.074

The independent samples t-test indicated that the difference in understanding scores between the PBL and Individual groups was statistically significant, p value 0.022 < 0.05 (alpha). The 95% confidence interval for the difference in means was -1.195 to -0.094.

These results suggest that students who participated in the Project-Based Learning approach scored significantly higher on the understanding score compared to those who received individual lecture-based instruction. The findings of this study provide strong evidence that PBL is more effective in improving student understanding compared to individual-based learning. The significant difference at alpha 0.05 in the independent t-test scores between the two groups supports the hypothesis that PBL can result in deeper learning and better knowledge retention.

Discussion

The teacher acts as a facilitator rather than a lecturer. Students have more control over their learning, allowing them to follow their interests and learn at their own pace (Weimer, 2013). This model is a true application of student-centre learning.

Students regularly reflect on their learning process, what they have achieved, and what they can improve. This helps deepen their understanding and allows them to make connections between what they have learned and how they learned it.

PBL often involves teamwork, where students work together to achieve a common goal. This collaboration helps students develop important skills such as communication, teamwork, and conflict resolution (Li & Steckelberg, 2006).

In this era, Project-Based Learning assignments stand out for their ability to prepare students for the complexities of the modern world. By fostering critical 21st-century skills, promoting real-world relevance, enhancing engagement, and preparing students for future challenges, PBL is a superior educational approach that meets the demands of today's rapidly evolving society (Lam, Cheng, & Ma, 2009). It goes beyond

traditional methods by not only teaching students content but also equipping them with the tools and mindset needed to succeed in life and work.

Project-based Assignment helps students develop a variety of skills beyond academic knowledge, including critical thinking, problem-solving, collaboration, communication, and self-management.

CONCLUSION

In conclusion, this study provides strong evidence that Project-Based Learning can significantly improve student understanding compared to individual teaching methods. By encouraging active engagement and real-world application of knowledge, PBL appears to be a powerful tool for improving educational outcomes.

The skills and mindsets developed through PBL are invaluable in real-world situations, preparing students for future academic, careers, and everyday life. As students take ownership of their projects and see their ideas become reality, they often experience increased confidence and self-esteem.

These results have important implications for educators seeking to improve student learning outcomes. The success of the PBL approach in this study suggests that incorporating project-based activities into the curriculum could be a valuable strategy for increasing student engagement and understanding, particularly in subjects that benefit from applied learning methods, such as the sciences.

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