

The Influence of Project-based Learning Model on Student Learning Motivation at Brawijaya University

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Abstract. Indonesian universities are facing challenges in improving the quality of learning in the era of Society 5.0. Adjusting the curriculum to remain relevant to current needs is necessary. The Project Based Learning (PjBL) method is recognized as a potential solution that allows students to deeply understand the material as well as develop critical thinking skills, creativity, project management, and teamwork. The purpose of this study is to determine the effect of the project-based learning model on the learning motivation of Brawijaya University students. This research utilizes a descriptive quantitative method, which allows for objective and accurate data collection. The data analysis techniques used include descriptive statistics and inferential statistics. Factors that showed a positive influence included activity duration, activity frequency, perseverance, fortitude, devotion, level of yearning, level of execution ability, and mentality direction. Thus, it can be concluded that the PjBL Learning Model has a positive and significant influence on the learning motivation of Brawijaya University students in the class of 2021-2023.

Keywords: PjBL Learning Model, student learning motivation, Brawijaya University students' batch 2021-2023.

1. Introduction

Higher education in Indonesia continues to grow rapidly, with around 9.32 million students enrolled by 2022. This development is supported by government policies such as Government Regulation No. 4/2014 on the Implementation of Higher Education. This figure shows the high interest and access to higher education in the country. Universities also continue to strive to raise the standard of instruction, as seen in Brawijaya University Rector's Regulation No. 55 of 2023 which emphasizes curriculum development that is responsive to the demands of industry and society.

The main challenge for universities today is to adjust the curriculum to the demands of the 5.0 era society. The results of Handayani and Muliastri's research [1] highlight the need to adapt the learning process that is relevant to the industrial revolution 4.0 and society 5.0, including the development of a new paradigm of education management based on artificial intelligence and information technology. In addition to knowledge, universities must also equip students with skills to transfer creativity, critical thinking, and digital literacy. Project Based Learning (PjBL) comes as a potential solution in facing these challenges. Hidayat defines PjBL as a teaching method in which students start with a problem as a first step and then improve

their ability to create projects [2]. This approach allows students to understand the material thoroughly, develop critical thinking, and take an active role in their education. PjBL is also believed to increase students' intrinsic motivation, especially for undergraduate students who are in an important transition phase towards professionalism that requires project management skills, teamwork, communication, critical thinking, and problem-solving abilities.

Students can gain autonomy and the opportunity to manage their own learning process through PJBL, which has a direct impact on their motivation to learn. In contrast, the difficulty undergraduate students face in maintaining their motivation to learn is often due to the prevalence of one-way or lecturer-centered learning approaches, which have little effect on practical applications in the field. Undergraduate project-based learning, or PJBL, is becoming increasingly important as it fulfills the requirements to motivate students to learn and make learning more applicable to real-world scenarios.

Previous research conducted by Mayangsari at Wisnuwardhana University has shown the effectiveness of PjBL in improving student motivation and learning outcomes [3]. Based on the background that has been described, research questions arise that need to be answered. The problem formulation of this research is: How is the Effect of Project Based Learning Model on the Motivation of Brawijaya University Students? This question became the main focus of the research, given the importance of learning motivation in students' academic success and the potential of PjBL as an effective learning method.

Considering the challenges in higher education and the potential of PjBL, The purpose of this study is to investigate "The Effect of Project Based Learning Model on Learning Outcomes for Students at Brawijaya University." This objective is not only relevant in the context of Brawijaya University, but can also provide valuable insights for other higher education institutions in Indonesia. By examining the impact of PjBL on learning motivation, this study hopes to contribute to the development of more effective and adaptive learning strategies tailored to the needs of students in the Society 5.0 era. Additionally, the findings are expected to serve as a basis for educational policies that promote innovative teaching methods, ultimately enhancing the quality of higher education in Indonesia.

2. Literature Review

2.1 Project-Based Learning Model

Project Based Learning (PjBL) is a student-centered learning approach as an active agent, where the learning process is emphasized rather than the end result. This model allows students to build knowledge through solving authentic problems relevant to real life [4]. PjBL integrates cognitive, social, and motivational learning theories, which encourage collaboration, autonomy, and the development of social and problem-solving skills. [5] stated that PjBL is effective in improving problem-solving skills, where students actively seek solutions to problems that are often related to their daily experiences. Through lecturer guidance, students are trained to think critically and creatively to understand and solve problems.

The implementation of PjBL not only increases learning motivation but also strengthens understanding of the material. Overall, PjBL provides significant benefits in learning through authentic tasks and collaborative work, which results in meaningful learning experiences relevant to real life [6]. Students' views on PjBL vary, depending on their learning preferences and the quality of implementation, but generally provide positive experiences in active engagement and social skills development.

2.2 Motivation of Student Learning Outcomes

Evaluation of learning motivation is an important process in the realm of education. According to Tyler [7], educational evaluation aims to assess the achievement of educational goals. [8] add that this evaluation is a systematic process to determine the effectiveness of educational efforts based on available evidence. Evaluation can be conducted during or after the program and the results are used to improve or design new, more effective programs.

Evaluation is an important step to assess the implementation of educational programs. According to [9], evaluation aims to gather information in order to choose the best alternative and assess the conformity of the results with the desired objectives. [10] identifies some of the purposes of evaluating learning motivation as follows:

1. Describing student skills. Assessing students' strengths and weaknesses in various subjects.
2. Knowing the success of the educational process. Measuring how effective education is in changing student behavior according to educational goals.
3. Determining follow-up. Identify the need for improvement of educational programs and strategies.
4. Provide accountability. Communicate evaluation results to relevant parties, such as the government, community and parents.

Evaluation aims to provide accurate information about students' learning motivation and the effectiveness of the teaching program. Cronbach [11] identified three uses of evaluation in decision-making:

1. Improvement of learning. Determining appropriate teaching materials and methods and recognizing necessary changes.
2. Individual decisions. Identifying student needs for instructional planning, selection, grouping, and understanding student strengths and weaknesses.
3. Administrative arrangements. Assessing the performance of systems and individuals, such as teachers.

Evaluation in education has an important role in helping teachers understand the extent to which educational goals are being achieved and in planning better learning [8]. Evaluation of learning motivation focuses on the effectiveness of learning, assessing the extent to which students achieve predetermined goals, and is used to improve and develop teaching programs. Evaluation principles, according to [12] and [10], include:

1. Clarity of Purpose. Design the evaluation with clear and comprehensive objectives.
2. Continuity. Evaluation should be an integral part of a continuous learning process.
3. Completeness of Tools. Use a variety of evaluation tools to measure cognitive, affective and psychomotor aspects.
4. Follow-up. Evaluation results are used to provide guidance and improvement in learning.

3. Research Methods

This research employs an explanatory quantitative approach to examine the impact of the Project-Based Learning (PjBL) method on the learning motivation of Brawijaya University students from the 2021-2023 cohorts. The study design identifies PjBL as the independent variable, while student learning motivation is treated as the dependent variable. The research population consists of Brawijaya University students who have been exposed to PjBL, and a sample of 55 respondents was chosen using the Purposive Sampling technique, based on Malhotra's formula.

Data were collected through questionnaires using a Likert scale instrument, which was chosen for its ability to measure psychological variables such as attitudes, opinions, and perceptions. Data analysis used descriptive and inferential statistical techniques in accordance with the quantitative approach. This research aims to gain an in-depth and measurable understanding of how the PjBL learning method affects student learning motivation, with the hope of providing valuable insights for the development of learning methods at the tertiary level. The analytical technique applied in this study is simple linear regression, which assesses the influence of the independent variable on the dependent variable. Additionally, a correlation coefficient test was performed to evaluate the strength and direction of the relationship between the variables, and a coefficient of determination test was used to measure the extent to which the independent variable accounts for the variation in the dependent variable. All analyses were conducted using IBM SPSS Statistics 25 software. for the conceptual model as follows:

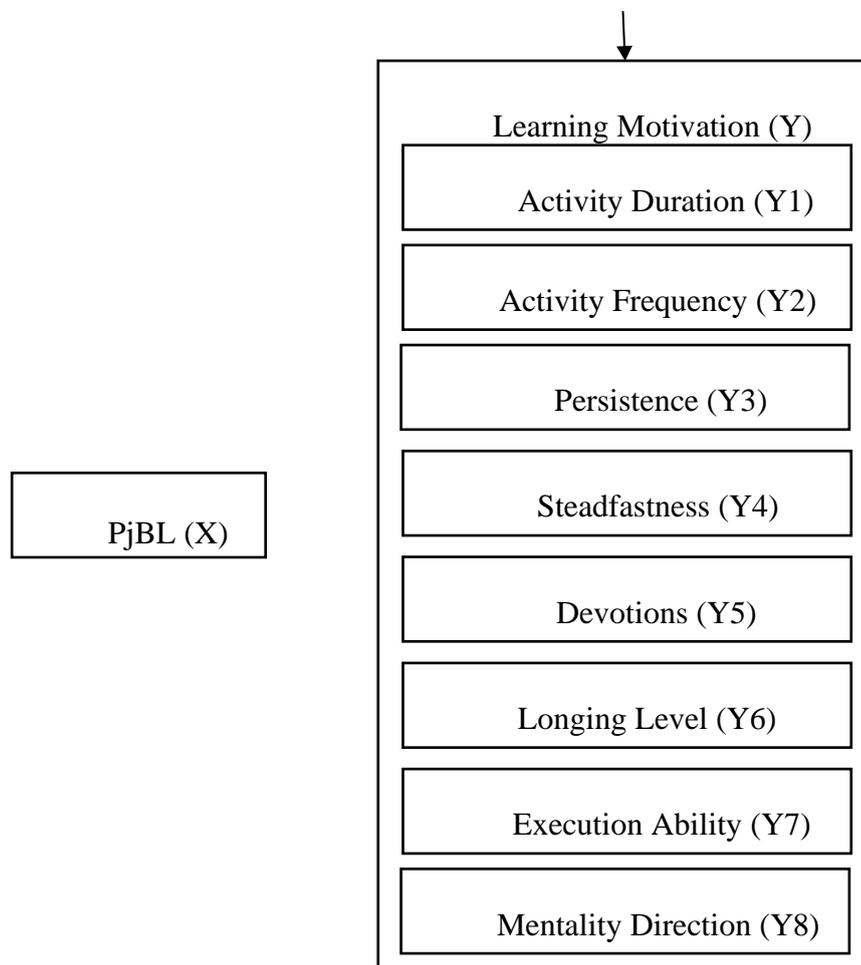


Figure 1. Conceptual model
Source: Researcher Processed Data, 2024

4. Results and Discussion

4.1 Research and Results

Overview of Brawijaya University

Brawijaya University is one of Indonesia's leading universities with more than 60,000 students, offering vocational, bachelor's, master's, doctoral, professional, and specialist programs. Brawijaya University has obtained accreditation from the National Accreditation Board for Higher Education and LAMPTKES for Grade A National from the National Accreditation Board for National Accreditation. UB has also been internationally accredited by various accreditation agencies, with one of them being the UB Library which is accredited with Grade A from IATUL. The Accounting Study Program of the Faculty of Economics and Business is accredited by ACCA, Additionally, IFT accredits the Faculty of Agricultural Technology's Agricultural Product Technology Study Program, the Indonesian Accreditation Board's IABEE for Engineering Education, the Alliance on Business Education, and Scholarship for Tomorrow, also a member of the ASEAN University Network Quality Assurance association, with many AUN-QA Certified and Accredited Study Programs. Universitas Brawijaya has 18 faculties [13].

Descriptive Statistics

Table 1. Descriptive Statistics Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
X1_TOTAL	108	4	10	7.47	1.562
Student Learning Motivation	108	18	40	31.19	3.880
Valid N (listwise)	108				

Source: Researcher Processed Data, 2024

Table 1 shows that 108 respondents have finished the questionnaire and submitted their answers. The PjBL learning model, or variable X, has an average or mean value of 7.47. One way to express the respondents' responses to variable X (PjBL learning model) is as a mean value of 7.47. The average or mean value of variable Y, which measures students' motivation to learn, is 31.19. One way to express respondents' responses to variable Y (student learning motivation) is to use the mean value of 31.19.

Normality Test

Table 2. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		108
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	3.31076474
Most Extreme Differences	Absolute	.070
	Positive	.050
	Negative	-.070
Test Statistic		.070
Asymp. Sig. (2-tailed)		.200 ^{c,d}
<p>a. Test distribution is Normal.</p> <p>b. Calculated from data.</p> <p>c. Lilliefors Significance Correction.</p> <p>d. This is a lower bound of the true significance.</p>		

Source: Researcher Processed Data, 2024

The normality test results shown in the above table are used to calculate the Asymp Sig value. Value of 0.200 (2-tailed). The study's data, with a significance value of 0.200 ($0.200 > 0.05$), can be considered regularly distributed.

Linearity Test

Table 3. Linearity Test Results

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Student Learning Motivation * X1 TOTAL	Between Groups	(Combined)	486.713	6	81.119	7.288	.000
		Linearity	438.072	1	438.072	39.357	.000
		Deviation from Linearity	48.641	5	9.728	.874	.501
	Within Groups		1124.204	101	11.131		
Total			1610.917	107			

Source: Researcher Processed Data, 2024

The Deviation from Linearity value is 0.501 based on the linearity test results shown in the table image above. The study data can be deemed linear when the Deviation from Linearity score is 0.501 ($0.501 > 0.05$).

Heteroscedasticity Test

Table 4. Heteroscedasticity Test Results

Coefficients ^a						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	3.153	.942		3.348	.001
	X1_TOTAL	-.069	.123	-.054	-.560	.577

a. Dependent Variable: ABS

Source: Researcher Processed Data, 2024

A significance value of 0.577 is found based on the heteroscedasticity test findings in the above table. The research data can be deemed free of heteroscedasticity symptoms with a significant value of 0.577 ($0.577 > 0.05$).

Simple Analysis Linear Regression

Table 5. Simple Analysis Linear Regression Results

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.521 ^a	.272	.265	3.326

a. Predictors: (Constant), PjBL Learning Model

b. Dependent Variable: Learning Motivation

Source: Researcher Processed Data, 2024

Correlation Coefficient Test (R1)

The link between the independent and dependent variables is displayed by the correlation coefficient (R). There is a correlation coefficient of 0.521 based on the given table. This figure illustrates the 52.1% correlation between the PjBL Learning Model, which is the independent variable, and the learning motivation of the Brawijaya University class of 2021–2023.

Determination Coefficient Test (R2)

The coefficient of determination shows how much of the effect of the independent variable went into the dependent variable. The coefficient of determination is obtained by

squaring the correlation coefficient value. The coefficient of determination (R²) is 0.272 based on table 4. This result indicates that the learning motivation of Brawijaya University students in the 2021–2023 batch is dependent on the PjBL Learning Model, with a 27.2% influence as the independent variable. On the other hand, the other figure, which comes to 72.9% (100% - 27.2%), represents the value that is affected by unstudied external variables.

Table 6. T Test Results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.512	1.572		13.687	.000
	X1_TOTAL	1.296	.206	.521	6.292	.000

a. Dependent Variable: Student Learning Motivation

Source: Researcher Processed Data, 2024

The computed t value is 6.292 based on the t-test findings in the above table. Based on the computed t value of 6.292, it can be inferred that the learning motivation of Brawijaya University students in the 2021–2023 class is influenced by the PjBL Learning Model as an independent variable (6.292 > 1.66177).

Table 7. F Test Results

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	483.072	1	438.072	39.592	.000 ^b
	Residual	1172.844	106	11.065		
	Total	1610.917	107			

a. Dependent Variable: Student Learning Motivation

b. Predictors: (Constant), X1_TOTAL

Source: Researcher Processed Data, 2024

The calculated F value, which is based on the F test results displayed in the previous table, is 39.592. As per the computed F value of 39.592 (39.592 > 2.76), the learning motivation of Brawijaya University students in the 2021–2023 batch is influenced by the PjBL Learning

Model, which is the independent variable. With a significance value of 0.000, the dependent variable ($0.00 < 0.05$) indicates that the PjBL Learning Model, as the independent variable, significantly affects the learning motivation of Brawijaya University students in the class of 2021–2023.

Hypothesis Recapitulation

The results of the F test, where the calculated f value is larger than the F table ($33.436 > 2.76$), and the t test, where the calculated t value is more than the t table ($5.782 > 1.66177$), provide the following summary of the hypothesis testing in this study:

Table 8. Recapitulation of Research Hypothesis Test

Hypothesis	Results
The PjBL Learning Model (X) has an influence on the phenomenon of student learning motivation (Y) among the 2021-2023 Class of Brawijaya University	Accepted
The PjBL Learning Model (X) has no influence on the phenomenon of student learning motivation (Y) among the 2021-2023 Class of Brawijaya University	Rejected

Source: Researcher Processed Data, 2024

The results of the study show a strong relationship between the PjBL Learning Model and the 2021–2023 class of Brawijaya University students’ enthusiasm to learn. As evidenced by the efficacy variable (X) regression coefficient of 1.296, learning motivation among Brawijaya University students in the class of 2021–2023 will rise by 1.296 for every 1% increase in the PjBL Learning Model. In this instance, the coefficient is positive, indicating a unidirectional influence between the learning motivation of Brawijaya University students in the class of 2021–2023 and the PjBL Learning Model as an independent variable.

4.2 Discussion

The study’s data interpretation was done based on the data analysis results in order to determine how variable X—the PjBL Learning Model—affects variable Y, which is the learning motivation of Brawijaya University students in the 2021–2023 batch. The data analysis methods employed in this study included descriptive statistics, basic linear regression analysis, validity and reliability testing of the research instrument, and traditional assumption tests. Based on the data analysis techniques carried out by researchers, a number of analysis results can be interpreted as follows:

Researchers set Brawijaya University students in the 2021-2023 batch as respondents because the majority had used the PjBL Learning Model. In previous research conducted by Sizillia Noranda Mayangsari, she was interested in how PJBL affected the learning motivation of Wisnuwardhana University Malang students in (2014/2015) [3]. The results of data analysis on descriptive statistics show the mean value on the PjBL Learning Model as variable X of 7.47. This value shows the average respondent’s answer to each variable X item is 7.47. According to the predefined measurement scale, the average respondents agreed-upon solution

to the PjBL Learning Model problem is 7.47, which is the X variable. Meanwhile, the learning motivation of the 2021-2023 batch of Brawijaya University students as variable Y has a mean value of 31.19. This value shows that the average respondent's answer to each variable Y item is 31.19. According to the predetermined measurement scale, the value of 31.19 indicates that the average respondent has a fairly agreed answer to the problem of learning motivation of Brawijaya University students in the 2021-2023 batch as variable Y.

The value of $r_{count} > r_{table}$ indicates that the validity test findings, which were obtained by researchers using the Pearson Product Moment method, have satisfied the requirements. This signifies that the study's findings have been deemed legitimate and trustworthy. Reliable data (above the value of 0.7) is the outcome of the reliability test conducted using the Cronbach Alpha technique. This suggests that the study's findings can be deemed consistent. Simple linear regression analysis can be performed since the findings of the traditional assumption test, which include the normality, linearity, and heteroscedasticity tests, have satisfied the requirements.

The coefficient of determination (R^2) value in the outcomes of the basic linear regression analysis was 0.272. This value shows that the PjBL Learning Model as X has an influence of 27.2% on the phenomenon of learning motivation of Brawijaya University students in the 2021-2023 batch as Y. However, the other value, 72.9%, is the result of other factors that were not looked at. The PjBL Learning Model variable (X) and the learning motivation variable of Brawijaya University students in batch 2021-2023 (Y) have a significant relationship, according to the T test analysis that was conducted. This is evident from the fact that the t count was higher than the t table ($5.782 > 1.66177$). Thus, it can be concluded that H_1 is accepted and H_0 is rejected. This means that the PjBL Learning Model (X) affects the phenomenon of learning motivation of Brawijaya University Students Batch 2021-2023 (Y). The factors that influence learning motivation are Activity Duration, Activity Frequency, Persistence, Fortitude, Devotion, Longing Level, Degree of Execution Ability, and Mentality Direction (Susanto, 2018).

Citing the findings of earlier studies by Sizillia Noranda Mayangsari on the impact of learning motivation on even semester students enrolled in the Mathematics Education Study Program at the Faculty of Teacher Training and Education, Wisnuwardhana University Malang, during the 2014/2015 academic year, when employing the PjBL learning method, making students appear more active, motivated, and the cooperation between them appears more compact. In the observations made, it can be monitored that students increasingly understand about various learning models and their syntax. Lesson plans from the project demonstrated a notable improvement in the alignment between the features of the taught mathematical content and the learning model. The majority of students in the mathematics lesson planning course had marks above C+, indicating an improvement in their learning outcomes. This demonstrates that in mathematics learning planning courses, PjBL can be utilized as a successful substitute to enhance student learning outcomes [3].

Based on the study's findings, Brawijaya University students' learning motivation in the class of 2021-2023 is significantly impacted by the PjBL Learning Model. This is demonstrated by the efficacy variable (X) regression coefficient of 1.296, which indicates that for every 1% increase in the PjBL Learning Model, the level of learning motivation among Brawijaya University students in the 2021-2023 batch will rise by 1.296. The learning motivation of Brawijaya University students in batch 2021-2023 and the PjBL Learning Model, the independent variable, have a unidirectional influence in this instance, as indicated by the positive coefficient.

5. Conclusion

This research was conducted to examine the effect of the Project Based Learning (PjBL) Learning Model on the learning motivation of Brawijaya University students class of 2021-2023. In this study, the PjBL Learning Model is described as a variable that affects student learning motivation. This model involves project-based learning that emphasizes the active involvement of students in the learning process through real projects. With this method, students are expected to increase their interest and motivation in participating in the learning process.

Based on the results of the analysis conducted, it is evident that there is a significant relationship between the PjBL Learning Model and Student Learning Motivation. This can be seen from the results of the simple regression statistical test which shows that this learning model has a real influence on student learning motivation. The T-test results also support this finding, with the calculated t value greater than the t table, indicating that the effect of the PjBL Model on learning motivation is not just coincidental. In addition, regression analysis showed that the PjBL Model contributed 27.2% to the increase in student learning motivation. This means that the application of this learning model is able to influence more than a quarter of the factors that contribute to learning motivation.

The regression equation obtained in this study illustrates that any increase in the application of the PjBL Model will increase student learning motivation by 1.296. That is, the better the application of the PjBL Model, the higher the learning motivation shown by students. This proves that PjBL can provide a positive boost to learning motivation, in accordance with theory and previous research which states that project-based learning can increase student involvement and activeness in the learning process.

The factors that determine this positive influence include the duration and frequency of learning activities, students' perseverance in completing the project, their level of enthusiasm and commitment to the assigned tasks, and their ability to execute project-related tasks. Mentality factors, such as resilience in facing challenges during the project, are also important indicators that show the success of this learning model.

Thus, it can be concluded that the Project Based Learning (PjBL) Model has a positive and significant influence on the learning motivation of Brawijaya University students class of 2021-2023. The application of the PjBL Model is proven to be effective in increasing students' learning motivation, because it encourages them to be more actively involved, independent, and enthusiastic in the learning process. This model can be used as a powerful strategy to improve the quality of learning in higher education, especially in preparing students to face the challenges of the world of work that require practical skills and critical thinking skills.

This research is expected to make a practical contribution to the application of the PjBL Learning Model at Brawijaya University, especially in increasing student learning motivation. It is important to pay attention to strengthening the implementation of the PjBL Learning Model by focusing on improving the quality of implementation, training lecturers, and developing diverse activities. Effective implementation of this model will have a significant impact on student learning motivation.

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