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The Effect of Project-Based Strategies and Learning Motivation on Student Engagement in the Learning Process at AMIK Bukittinggi

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Abstract

Student engagement is a key indicator in determining the quality of the learning process at higher education institutions. However, student engagement at AMIK Bukittinggi remains suboptimal, as evidenced by low participation in discussions, a lack of confidence in expressing opinions, and limited involvement in learning activities. This study aims to analyze the influence of Project-Based Learning Strategies and Learning Motivation on Student Engagement in the learning process at AMIK Bukittinggi. The study employed a quantitative approach with an associative research design. The study population consisted of 132 active students in the Information Management Study Program at AMIK Bukittinggi for the 2025/2026 academic year, with a sample of 99 students determined using the Slovin formula and the Proportionate Stratified Random Sampling technique. Data were collected via a questionnaire and analyzed using multiple linear regression. The results indicate that Project-Based Strategies have a positive and significant effect on Student Engagement (t = 2.982; sig. = 0.033). Learning Motivation also has a positive and significant effect on Student Engagement (t = 3.713; sig. = 0.000) and is the variable with the more dominant influence. Simultaneously, Project-Based Strategies and Learning Motivation have a significant effect on Student Engagement (F = 23.400; sig. = 0.000) with a coefficient of determination (R^2) of 0.328. This study concludes that student engagement can be enhanced by optimizing the implementation of Project-Based Strategies and strengthening Learning Motivation in the learning process.

Keywords Project-Based Strategies; Learning Motivation; Student Engagement

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1. INTRODUCTION

Higher education plays a strategic role in producing human resources who are outstanding, adaptable, and capable of competing amid advances in science and technology. In the modern learning paradigm, students are no longer positioned as passive recipients of information but rather as active agents who construct knowledge through direct engagement in the learning process. Student engagement is a key indicator of learning quality because active participation fosters deeper understanding, critical thinking skills, and more meaningful learning experiences. Conversely, passive learning tends to result in superficial and less sustainable understanding. Student engagement reflects behavioral, cognitive, and affective involvement in the learning process, as demonstrated through

activities such as asking questions, discussing, expressing opinions, thinking critically, collaborating, and taking responsibility for academic tasks (Rismayanti et al., 2023). This concept aligns with the theory of student engagement proposed by Fredricks et al., (2004), which views student engagement as a multidimensional construct encompassing behavioral, cognitive, and affective dimensions.

One factor believed to increase student engagement is the Project-Based Learning Strategy. Theoretically, this strategy is rooted in constructivism, which views learning as an active process of constructing knowledge through experience. Project-based learning places the project at the center of learning activities, so that students are engaged in problem exploration, collaboration, discussion, and systematic problem-solving. Through this engagement, students have the opportunity to develop critical thinking, communication, collaboration, creativity, and responsibility for their own learning. Various studies show that the implementation of project-based learning contributes to increased student engagement, problem-solving skills, independent learning, and active participation in the learning process (Mariya et al., 2024). These findings indicate that the Project-Based Strategy has the potential to be an effective approach for enhancing student engagement in higher education.

In addition to external factors such as learning strategies, student engagement is also influenced by an internal factor: learning motivation. Learning motivation is a psychological drive that determines the direction, intensity, and persistence of an individual's learning behavior. Students with high learning motivation tend to demonstrate greater enthusiasm for learning, actively seek information, participate in learning activities, and show perseverance in completing academic assignments (Sembiring & Nura, 2022). Conversely, low learning motivation can lead students to be less engaged in the learning process and exhibit passive behavior during lectures. Self-Determination Theory, proposed by Ryan & Deci, (2020), explains that motivation plays a crucial role in driving an individual's engagement in learning activities. Various empirical studies also indicate that learning motivation has a positive relationship with students' activity levels and engagement in academic activities (Izwar & Kristanti, 2023).

Although numerous studies have been conducted on project-based strategies and learning motivation, most previous research has examined these two variables separately. The studies by Mariya et al., (2024) and Permata et al., (2024) focused on the influence of project-based strategies on the learning process and outcomes, while the studies by Izwar & Kristanti (2023) and Sembiring & Nura (2022) emphasized the role of learning motivation in enhancing student engagement. However, research examining the simultaneous effects of Project-Based Strategies and learning motivation on student engagement in the context of vocational higher education remains relatively limited. Research on Project-Based Strategies generally focuses on improving learning outcomes, critical thinking skills, or problem-solving skills, whereas research on Learning Motivation more often examines its relationship

with academic achievement and learning engagement. Furthermore, most studies have been conducted at the elementary, secondary, or academic higher education levels. Research examining the simultaneous influence of Project-Based Learning Strategies and Learning Motivation on Student Engagement in the context of vocational higher education remains relatively limited. However, the nature of vocational education—which emphasizes a balance between theory and practice requires learning strategies and motivational conditions capable of fostering optimal student engagement (Maheswari & Reinaldi, 2025).

A preliminary study conducted at AMIK Bukittinggi showed that student engagement in the learning process is still not optimal. Results from classroom observations and interviews with faculty members indicated that some students tend to be passive in discussions, are hesitant to ask questions, and are not fully engaged in learning activities. The results of an initial mapping survey of 35 students also showed that student engagement levels fell into the low category, with an average score of 2.82. Indicators such as asking questions, participating in discussions, and the willingness to express opinions received relatively low scores compared to other indicators. Furthermore, the implementation of Project-Based Learning at AMIK Bukittinggi has not been uniformly applied across all courses, while students' learning motivation varies. These conditions indicate the existence of issues that require further examination regarding the factors influencing student engagement in the learning process.

Based on the above discussion, there is an empirical gap between theoretical expectations—which identify Project-Based Strategies and Learning Motivation as key factors in enhancing student engagement—and the actual learning conditions at AMIK Bukittinggi, where student engagement remains low. The novelty of this study lies in testing the simultaneous effects of Project-Based Strategies and Learning Motivation on Student Engagement in the context of vocational higher education. Therefore, this study aims to analyze the effect of Project-Based Strategies on student engagement, analyze the effect of Learning Motivation on student engagement, and analyze the simultaneous effect of Project-Based Strategies and Learning Motivation on student engagement in the learning process at AMIK Bukittinggi.

2. METHOD

This study employs a quantitative approach using an associative research design aimed at analyzing the influence of Project-Based Strategies (X_1) and Learning Motivation (X_2) on Student Engagement (Y) in the learning process at AMIK Bukittinggi. The study population consisted of 132 active students in the Information Management Study Program for the 2025/2026 academic year. The sample comprised 99 students, determined using the Slovin formula with a 5% margin of error. The sampling technique employed Proportionate Stratified Random Sampling, ensuring that every student

had an equal chance of being selected as a research respondent.

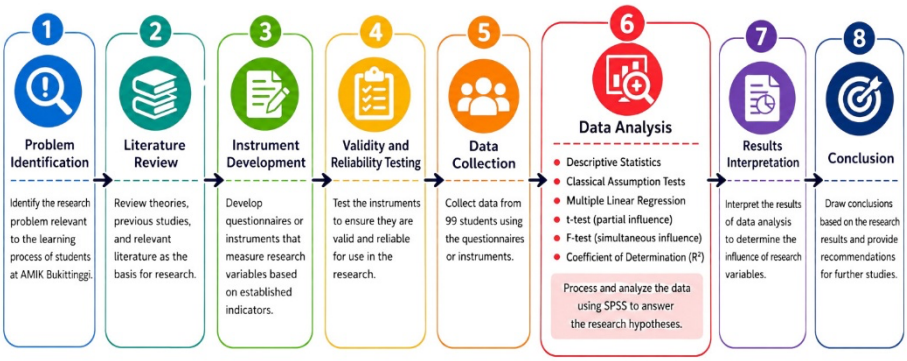

Figure 1. Research Stages

Research data were collected using a questionnaire with a five-point Likert scale consisting of the variables Project-Based Strategies, Learning Motivation, and Student Engagement. Before use, the research instrument was tested for validity and reliability to ensure its suitability for measuring the research variables. Project-Based Strategies were measured through the indicators of project planning, project implementation, collaboration, problem-solving, and evaluation of project outcomes. Learning Motivation was measured using indicators of learning persistence, interest in learning, enthusiasm for learning, independence in learning, and achievement orientation. Meanwhile, Student Engagement was measured using indicators of asking questions, answering questions, expressing opinions, participating in discussions, and involvement in learning activities.

Data analysis was conducted using descriptive and inferential statistics with the aid of SPSS version 26 software. Descriptive analysis was used to describe the characteristics of each research variable, while inferential analysis was conducted through classical assumption tests, multiple linear regression analysis, t-tests to determine partial effects, F-tests to determine simultaneous effects, and the coefficient of determination (R^2) to determine the extent of the independent variables' contribution to the dependent variable. The regression equation model used in this study is $Y = a + b_1X_1 + b_2X_2 + e$, where Y represents Student Engagement, X_1 represents Project-Based Strategies, X_2 represents Learning Motivation, a is the constant, b_1 and b_2 are the regression coefficients, and e represents the error term.

3. FINDINGS AND DISCUSSION

FINDINGS

3.1 Respondent Characteristics and Description of Research Variables

The study was conducted among active students in the Information Management Study Program at AMIK Bukittinggi for the 2025/2026 academic year. A total of 99 questionnaires were distributed to respondents, and all questionnaires were successfully returned and fully processed, resulting in a 100% response rate. This indicates that the data obtained meets the requirements for further analysis.

Descriptive analysis was conducted to provide an overview of the Project-Based Strategy, Learning Motivation, and Student Engagement variables. The results of the analysis show that the three variables have distinct characteristics, as presented in Table 1.

Table 1. Descriptive Statistics of Research Variables

		Project-Based_Strategy	Learning_Motivation	Student_Engagement
N	Valid	99	99	99
	Missing	0	0	0
Mean		50.12	51.67	36.67
Standard Error of the Mean		.578	.537	,357
Median		50.00	51.00	36.00
Mode		47	50	36
Standard Deviation		5.749	5,345	3,554
Range		35	29	23
Minimum		33	37	25
Maximum		68	66	48
Sum		4962	5115	3,630

Source: Primary data processed using SPSS, 2026.

Based on Table 1, the Project-Based Strategy variable has a mean score of 50.12. Since this variable is measured using 15 statements, the average score per item is obtained by dividing the mean by the number of items, namely 50.12 ÷ 15 = 3.34. This value indicates that the average of the respondents' answers falls into the "fairly good" category. These results indicate that Project-Based Strategies have been implemented in the learning process, although they are not yet fully optimal across all aspects of learning.

The Learning Motivation variable has a mean score of 51.67. With a total of 15 items in the instrument, the average score per item is 3.44 (51.67 ÷ 15). This value indicates that students' learning motivation falls into the high category. These findings suggest that students possess relatively strong motivation to learn, as reflected in their diligence in attending classes, interest in the course material, and commitment to completing academic assignments.

Meanwhile, the Student Engagement variable has a mean score of 36.67. This variable was measured using 12 items, resulting in an average score per item of 3.06 (36.67 ÷ 12). This value indicates that Student Engagement falls into the "moderate" category. This suggests that students have demonstrated engagement in the learning process; however, their participation in asking questions, expressing opinions, and interacting during class activities still needs improvement.

Overall, the results of the descriptive analysis show that Learning Motivation has the highest average score (3.44), followed by Project-Based Strategies (3.34), and Student Engagement (3.06). These findings suggest that although students' learning motivation is relatively high, their level of

engagement remains in the "adequate" category. Therefore, learning strategies are needed that can optimize the learning motivation students already possess, thereby encouraging increased engagement in the learning process.

3.2 Classical Assumption Tests

Before conducting multiple linear regression analysis, classical assumption tests were first performed to ensure that the data met the necessary statistical requirements. These tests included normality and homogeneity tests.

Table 2. Results of the Normality Test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Project-Based_Strategy	,090	99	,055	,972	99	,054
Learning_Motivation	,087	99	,064	,982	99	,188
Student_Engagement	,059	99	,074	,962	99	.086
a. Lilliefors Significance Correction						

Based on Table 2, the results of the normality test using the Kolmogorov-Smirnov method indicate that all research variables have significance values greater than 0.05. The Project-Based Strategy variable obtained a significance value of 0.055, Learning Motivation of 0.064, and Student Engagement of 0.074. These results indicate that the data for all variables are normally distributed. Thus, the research data satisfy one of the key assumptions in multiple linear regression analysis and are therefore suitable for hypothesis testing.

Table 3. Homogeneity Test Results

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Project-Based Strategy	Between Groups	1284.034	17	75,531	5,130	,085
	Within Groups	1,954,512	81	24,130		
	Total	3,238,545	98			
Learning Motivation	Between Groups	1,050.496	17	61,794	3,861	,061
	Within Groups	1,749,504	81	21,599		
	Total	2,800,000	98			

Based on Table 3, the results of the homogeneity test show that the Project-Based Strategy variable has a significance value of 0.085, while the Learning Motivation variable has a significance value of 0.061. Both significance values are greater than 0.05, so it can be concluded that the research data has homogeneous variance. This indicates that the distribution of data across groups is relatively uniform

and meets the requirements for further analysis using multiple linear regression.

Overall, the results of the normality and homogeneity tests show that the research data meet the basic assumptions of parametric analysis. Therefore, multiple linear regression analysis can proceed to test the effects of Project-Based Strategies and Learning Motivation on student engagement in the learning process at AMIK Bukittinggi.

3.3 The Effect of Project-Based Strategies and Learning Motivation on Student Engagement

To determine the effects of Project-Based Strategies and Learning Motivation on Student Engagement, a multiple linear regression analysis was conducted, as presented in Table 4.

Table 4. Results of Multiple Linear Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	62.543	5,403		11,576	0.000
	TOTAL_X1_Project-Based Strategy	0.224	0.126	0.225	2.982	0.033
	TOTAL_X2_Learning Motivation	0.491	0.132	0.472	3.713	0.000

a. Dependent Variable: TOTAL_Y_Student Engagement

Based on Table 4, the following multiple linear regression equation was obtained:

$Y = 62.543 + 0.224X1 + 0.491X2$

This equation indicates that Project-Based Strategies and Learning Motivation have a positive relationship with Student Engagement. The regression coefficient for Project-Based Strategies, which is 0.224, indicates that a one-unit increase in Project-Based Strategies will increase Student Engagement by 0.224 units, assuming all other variables remain constant. Meanwhile, the regression coefficient for Learning Motivation of 0.491 indicates that a one-unit increase in Learning Motivation will increase Student Engagement by 0.491 units. This coefficient value shows that Learning Motivation has a greater influence than Project-Based Strategies in increasing Student Engagement.

To determine the significance of the effect of each independent variable on the dependent variable, a partial test (t-test) was conducted, while a simultaneous test (F-test) was conducted to determine the combined effect of both variables. The results of the hypothesis testing are presented in Table 5.

Table 5. Hypothesis Test Results

Hypothesis	Test Value	Sig.	Decision
H_1: Project-Based Strategy → Student Engagement	t = 2.982	0.033	Accepted
H_2: Learning Motivation → Student Engagement	t = 3.713	0.000	Accepted
H_3: Project-Based Strategies and Learning Motivation → Student Engagement	F = 23.400	0.000	Accepted

Source: Primary data analyzed using SPSS, 2026.

The results of the partial test show that Project-Based Strategies have a positive and significant effect on Student Engagement with a significance value of 0.033 (< 0.05). Thus, the first hypothesis is accepted. These results indicate that the better the implementation of Project-Based Strategies, the higher the level of Student Engagement in the learning process.

Furthermore, Learning Motivation was also found to have a positive and significant effect on Student Engagement, with a significance value of 0.000 (< 0.05). Therefore, the second hypothesis is accepted. This finding indicates that students with high Learning Motivation tend to be more active in participating in the learning process compared to students with low Learning Motivation.

Simultaneously, Project-Based Learning Strategies and Learning Motivation have a significant effect on Student Engagement, with a calculated F-value of 23.400 and a significance level of 0.000 (< 0.05). Thus, the third hypothesis is accepted. These results indicate that increased Student Engagement is influenced not only by learning strategy factors but also by internal factors such as Learning Motivation

3.4 Coefficient of Determination (R^2)

The coefficient of determination is used to determine the extent to which the variables Project-Based Strategies and Learning Motivation can explain the variation in Student Engagement. The results of the coefficient of determination test are presented in Table 6.

Table 6. Coefficient of Determination (R^2) Results

Model Summary[b]

Model	R	R Square	Adjusted R-Square	Standard Error of the Estimate
1	.572[a]	0.328	0.314	7.792

a. Predictors: (Constant), TOTAL_X2_LearningMotivation, TOTAL_X1_Project-BasedStrategies
b. Dependent Variable: TOTAL_Y_Student_Engagement

Based on Table 6, the coefficient of determination (R-squared) was found to be 0.328. These results indicate that Project-Based Strategies and Learning Motivation together account for 32.8% of the variation in Student Engagement in the learning process at AMIK Bukittinggi. Meanwhile, 67.2% of the variation in Student Engagement is influenced by other factors not examined in this study.

The correlation coefficient (R) value of 0.572 indicates that the relationship between Project-Based Strategies and Learning Motivation with Student Engagement falls into the moderate category. This finding suggests that both independent variables make a significant contribution to enhancing student engagement, although they are not the sole factors influencing student involvement in the learning process.

The fact that the magnitude of the influence has not reached 50% suggests that student engagement is a complex phenomenon influenced by various other factors beyond the scope of this study's model. These factors may include instructors' competence in managing the learning process, the learning environment, learning facilities, social support, individual student characteristics, or other psychological factors not included in the research model. Therefore, future research could develop a more comprehensive model by adding other relevant variables to obtain a more complete picture of the factors influencing student engagement.

DISCUSSION

The results of the study indicate that Project-Based Strategies and Learning Motivation have a positive and significant influence on student engagement in the learning process at AMIK Bukittinggi. These findings suggest that student engagement is influenced not only by internal factors originating from the students themselves but also by the learning strategies implemented in the classroom. The results of the descriptive analysis show that Project-Based Strategies fall into the "moderate" category with an average score of 3.34, Learning Motivation falls into the "high" category with an average score of 3.44, while Student Engagement falls into the "moderate" category with an average score of 3.06. These findings indicate that although students have relatively good learning motivation, their level of engagement in the learning process is still not optimal; therefore, learning strategies that can encourage more active student participation are needed.

The positive effect of Project-Based Strategies on student engagement is evident from the results of the partial test, which showed a t-value of 2.982 with a significance level of 0.033. These findings indicate that the better the implementation of Project-Based Strategies, the higher the level of student engagement in the learning process. These research findings align with the constructivist theory proposed by Piaget and Vygotsky, which posits that knowledge is actively constructed through learning experiences, social interaction, and problem-solving (Ardania et al., 2024). In project-based learning, students not only receive information from instructors but are also directly involved in the processes of exploration, discussion, collaboration, and task completion related to real-world situations. This involvement encourages students to be more active in asking questions, expressing opinions, collaborating in groups, and taking responsibility for their learning process.

The findings of this study reinforce the results of the research by Hikmawati et al., (2018), which stated that the implementation of Project-Based Learning can significantly increase students' active participation in learning. The results of this study are also consistent with the research by Sunardi & Hasanuddin, (2019), who found that project-based learning enhances student engagement through problem-solving activities and group collaboration. Furthermore, Kurniawan et al., (2021) explain that project-based learning can enhance students' academic independence and sense of responsibility toward assigned tasks. In the context of AMIK Bukittinggi, the results of this study indicate that although the implementation of project-based strategies has not yet been fully optimized across all courses, its application has made a tangible contribution to increasing student engagement in the learning process.

In addition to learning strategy factors, the research results also show that Learning Motivation has a positive and significant effect on Student Engagement, with a t-value of 3.713 and a significance level of 0.000. The regression coefficient for learning motivation, at 0.491 which is higher than the coefficient for project-based strategies at 0.224 indicates that learning motivation is a more dominant factor in increasing student engagement. These findings suggest that students with high learning motivation tend to be more active in class, more willing to express their opinions, more engaged in discussions, and more responsible for completing academic assignments.

The results of this study support the Self-Determination Theory developed by Ryan and Deci (2020), which explains that motivation is the primary factor determining an individual's direction, intensity, and persistence in engaging in learning activities. Students with strong intrinsic motivation will demonstrate higher engagement in the learning process because they view learning activities as a necessity and part of their personal development. Conversely, students with low motivation tend to be passive and participate only when faced with specific academic demands. The findings of this study are also consistent with the results of research by Rismayanti et al. (2023), Permata et al. (2024), and Maheswari & Reinaldi (2025), which concluded that learning motivation is one of the key factors influencing students' level of activity and engagement in academic activities.

Simultaneously, Project-Based Strategies and Learning Motivation were found to have a significant effect on Student Engagement, with an F-value of 23.400 and a significance level of 0.000. These results indicate that increasing student engagement requires a combination of effective learning strategies and strong learning motivation. Innovative learning strategies provide a learning environment that enables students to participate actively, while learning motivation serves as an internal driving force that encourages students to make the most of that environment. Thus, these two variables complement each other in shaping student engagement throughout the learning process.

The coefficient of determination (R^2) value of 0.328 indicates that Project-Based Strategies and Learning Motivation account for 32.8% of the variation in Student Engagement, while the remaining 67.2% is influenced by other factors not examined in this study. These results indicate that student engagement is a complex phenomenon influenced by various other factors, such as faculty competence, the learning environment, learning facilities, academic culture, social support, communication skills, and individual student characteristics. Nevertheless, the 32.8% contribution suggests that Project-Based Strategies and Learning Motivation are important factors that need to be considered in efforts to enhance student engagement.

The findings of this study reinforce the results of a preliminary study indicating that some students at AMIK Bukittinggi still tend to be passive in class discussions, lack the confidence to express their opinions, and are not yet fully engaged in the learning process. Therefore, efforts to increase student engagement are needed through the strengthened implementation of more structured project-based strategies and the development of learning programs capable of enhancing students' motivation to learn. From the perspective of Islamic Education Management, the results of this study highlight the importance of managing the learning process in a way that is not only oriented toward the delivery of course material but also toward creating a learning environment capable of fostering students' motivation, participation, and sense of responsibility in the pursuit of knowledge. Thus, increased student engagement can be achieved through the integration of appropriate learning strategies and the reinforcement of motivational factors as part of efforts to improve the quality of learning at vocational higher education institutions.

4. CONCLUSIONS

Based on the research findings, Project-Based Strategies and Learning Motivation were found to have a positive and significant effect on student engagement in the learning process at AMIK Bukittinggi. Specifically, Project-Based Strategies had a significant effect on student engagement with a significance value of 0.033 (<0.05), indicating that the implementation of project-based learning can increase student engagement in learning activities. Furthermore, Learning Motivation also has a positive and significant effect on Student Engagement with a significance value of 0.000 (<0.05). The research results indicate that Learning Motivation has a more dominant influence than Project-Based Strategies, making motivational factors a crucial element in encouraging active student participation throughout the learning process.

Simultaneously, Project-Based Learning and Learning Motivation had a significant effect on Student Engagement, with an F-value of 23.400 and a significance level of 0.000. These two variables accounted for 32.8% of the variation in Student Engagement, while the remaining 67.2% was influenced

by other factors outside the scope of this study. These findings indicate that increasing student engagement requires a combination of implementing student-centered learning strategies and strengthening learning motivation. Therefore, AMIK Bukittinggi needs to promote the more optimal implementation of Project-Based Strategies and create a learning environment that can enhance students' learning motivation to support a more active, effective, and meaningful learning process.

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