

Project-Based Learning and Teaching Motivation as Predictors of Elementary School Teacher Performance

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Abstract: This study examines the contribution of Project-Based Learning (PjBL) implementation and teaching motivation to elementary school teacher performance in North Jakarta. A quantitative cross-sectional survey was conducted with 50 teachers from SDN Warakas 03, 05, and 07 using census sampling. Data were collected through three 50-item Likert-scale instruments measuring PjBL implementation, teaching motivation, and teacher performance. Data were analyzed using descriptive statistics and multiple linear regression. The results showed that PjBL implementation had a positive and significant contribution to teacher performance ($B = 0.224$, $\beta = 0.225$, $p = 0.038$). Teaching motivation also had a positive and significant contribution and showed a stronger standardized contribution ($B = 0.750$, $\beta = 0.762$, $p < 0.001$). Simultaneously, PjBL implementation and teaching motivation significantly predicted teacher performance, with the model explaining 95.9% of the observed variance ($F(2, 47) = 543.097$, $p < 0.001$). These findings indicate that teacher performance is associated with both pedagogical practices and motivational conditions, with teaching motivation showing the stronger contribution in the model. The findings suggest that schools should integrate PjBL development with organizational support that strengthens teacher motivation and professional growth. Because the study used a cross-sectional design and self-reported data, the findings should be interpreted as statistical associations rather than causal effects.

Keywords: Project-Based Learning, teaching motivation, teacher performance, multiple linear regression, elementary school

Abstrak: Penelitian ini menganalisis kontribusi penerapan Project-Based Learning (PjBL) dan motivasi mengajar terhadap kinerja guru sekolah dasar di Jakarta Utara. Penelitian menggunakan pendekatan kuantitatif dengan desain survei cross-sectional terhadap 50 guru di SDN Warakas 03, 05, dan 07 dengan teknik sampling jenuh. Data dikumpulkan melalui tiga instrumen skala Likert yang masing-masing terdiri atas 50 butir untuk mengukur penerapan PjBL, motivasi mengajar, dan kinerja guru. Data dianalisis menggunakan statistik deskriptif dan regresi linear berganda. Hasil penelitian menunjukkan bahwa penerapan PjBL memberikan kontribusi positif dan signifikan terhadap kinerja guru ($B = 0,224$, $\beta = 0,225$, $p = 0,038$). Motivasi mengajar juga memberikan kontribusi positif dan signifikan dengan kontribusi terstandar yang lebih kuat ($B = 0,750$, $\beta = 0,762$, $p < 0,001$). Secara simultan,

penerapan PjBL dan motivasi mengajar secara signifikan memprediksi kinerja guru, dengan model menjelaskan 95,9% variasi kinerja guru ($F(2, 47) = 543,097, p < 0,001$). Temuan ini menunjukkan bahwa kinerja guru berkaitan dengan praktik pedagogis dan kondisi motivasional, dengan motivasi mengajar menunjukkan kontribusi yang lebih kuat dalam model. Temuan ini mengindikasikan perlunya pengembangan PjBL yang disertai dukungan organisasi untuk memperkuat motivasi dan pengembangan profesional guru. Karena penelitian menggunakan desain cross-sectional dan data self-report, hasil penelitian perlu dipahami sebagai hubungan statistik, bukan hubungan sebab-akibat.

Kata kunci: Project-Based Learning, motivasi guru, kinerja guru, regresi linier berganda, sekolah dasar.

Introduction

Teacher performance is a central factor in maintaining the quality of elementary education because teachers are responsible for planning instruction, facilitating learning, managing classroom activities, assessing learning, and responding to students' needs (Ahmed & Pierre, 2024; Alwi & Mumtahana, 2023). The increasing emphasis on student-centered and innovative learning requires teachers to perform beyond routine instructional delivery (Kim, 2025; Woods & Copur-Gencturk, 2024). Teachers are expected to design meaningful learning experiences, facilitate active participation, manage collaborative activities, and evaluate learning processes systematically (Dian Hikmayana, 2025; Yansyah et al., 2025). These demands make teacher performance closely related to both pedagogical practices and the conditions that support teachers in carrying out their professional responsibilities.

One pedagogical approach that places substantial demands on teachers is Project-Based Learning (PjBL). Unlike conventional instruction, PjBL requires teachers to organize authentic learning problems, formulate project objectives, plan learning activities, facilitate collaboration, monitor students' progress, and assess both processes and products (Darmawan et al., 2024; Retno et al., 2025). Consequently, PjBL is not only a learning strategy for students but also requires teachers to exercise planning, facilitation, classroom-management, monitoring, and assessment competencies (Aisyah & Novita, 2025; Asmiyunda et al., 2023). Previous studies have associated PjBL with improvements in teachers' professional abilities and pedagogical competence (Khodhori et al., 2025; Kholifah et al., 2024). However, the implementation of PjBL remains uneven because teachers may differ in their understanding, preparation, and ability to manage project-based activities.

Teacher performance is also shaped by motivational conditions. Teaching motivation provides the psychological and professional energy required for teachers to sustain effort, prepare lessons, adapt instructional materials, respond to classroom challenges, conduct assessment, and engage in professional development. Teachers with stronger motivation are more likely to demonstrate persistence and commitment in performing their professional responsibilities (Effiyanti et al., 2023; Kumari & Kumar, 2023; Pires, 2023). Recent empirical evidence also indicates a positive relationship between teacher motivation and professional performance, suggesting that motivational factors should not be treated merely as secondary conditions in understanding teacher performance (Fazilla & Rangkuti, 2023; Layek & Koodamara, 2024; Ulfah et al., 2024).

The existing literature provides evidence for both pathways, but the evidence is fragmented. Research on PjBL has largely examined student outcomes, collaborative learning, teacher competence, or professional ability, while studies on motivation have primarily examined teachers' job performance, professional commitment, or professional development (Basilotta Gómez-Pablos et al., 2017; Hollenstein & Brühwiler, 2024; Mahasneh & Alwan, 2018; Maritasari et al., 2022). provide particularly relevant evidence by examining project-based learning and learning motivation in relation to teacher competence and performance. Nevertheless, their study involved a different instructional context and incorporated mobile learning applications, whereas the present study focuses specifically on teachers' reported implementation of PjBL and teaching motivation within elementary schools.

This distinction indicates an empirical gap concerning the simultaneous examination of a pedagogical factor and a motivational factor as predictors of teacher performance in a specific elementary-school context. Previous studies have established that PjBL and motivation are individually associated with aspects of teacher competence and performance, but less attention has been given to their relative contributions when both predictors are examined in the same regression model among teachers within a defined school setting. Addressing this gap is important because teacher performance may depend not only on what teachers are expected to implement pedagogically but also on the motivational conditions that sustain those practices.

The present study therefore examines the statistical influence of Project-Based Learning (PjBL) implementation and teaching motivation on elementary school teacher performance in North Jakarta. The study has three specific objectives: first, to determine whether PjBL implementation is statistically associated with teacher performance; second, to determine whether teaching motivation is statistically associated with teacher performance; and third, to examine the joint contribution of the two predictors and compare their relative standardized contributions within the regression model. The study contributes context-specific empirical evidence by examining these two dimensions simultaneously among all eligible teachers in the selected elementary schools. Because the study uses a cross-sectional correlational design and self-reported measures, the term influence refers to statistical prediction or association rather than experimental causation.

Methodology

This study used a quantitative, cross-sectional survey with a correlational design. The research was conducted from August to December 2025 at SDN Warakas 03, SDN Warakas 05, and SDN Warakas 07, located in the same public-school complex in Tanjung Priok, North Jakarta. Project-Based Learning (PjBL) implementation (X1) and teaching motivation (X2) were specified as predictors, and teacher performance (Y) was the outcome variable. Because the design was observational, the term influence refers to statistical prediction rather than experimental causation. The population comprised all 50 active classroom and subject teachers at the three schools in the 2025/2026 academic year. Because the population was smaller than 100, all members were included through census (total population) sampling; therefore, the achieved sample was $n = 50$. Primary quantitative data were collected from teacher questionnaires, while school documents and semi-structured interviews with selected

teachers and principals were used only as contextual support. The characteristics of the respondents are presented in Table 1.

Three closed instruments used five-point Likert responses, including reverse scoring for negatively worded items. The Project-Based Learning (PjBL) instrument contained 50 items covering concept and characteristics (15 items), planning and implementation (15), and challenges and adaptation (20). The teaching-motivation instrument contained 50 items covering intrinsic motivation (20), basic psychological needs autonomy, competence, and relatedness (15), and motivational behavior (15). Teacher performance was measured with 50 items covering classroom practice (20), work behavior and integrity (15), and competency development (15). In this study, PjBL implementation refers to the extent to which teachers apply project-based learning practices in planning, implementation, and adaptation. Teaching motivation refers to teachers' intrinsic motivation, psychological needs, and motivational behavior in carrying out teaching responsibilities. Teacher performance refers to teachers' reported classroom practice, work behavior and integrity, and competency development.

Item validity was evaluated using Pearson item-total correlations at $\alpha = .05$ with r -table = .2787 ($df = 48$). All 50 items for each variable exceeded this threshold. Reliability recalculated from the tabulation data was high for Project-Based Learning (PjBL) (Cronbach's $\alpha = 0.948$), teaching motivation ($\alpha = 0.965$), and teacher performance ($\alpha = 0.965$). Questionnaires were distributed both offline and online after respondents received an explanation of the study and confidentiality procedures. The data were analyzed using descriptive statistics and multiple linear regression. Descriptive statistics were used to report the mean, standard deviation, and distribution of scores for each construct. Before regression analysis, the data were examined through prerequisite tests, including normality and multicollinearity assessment. Multiple linear regression was then used to estimate the statistical contribution of PjBL implementation and teaching motivation to teacher performance.

The regression model was specified as: $Y = a + b_1X_1 + b_2X_2 + e$, where Y represents teacher performance, X_1 represents PjBL implementation, X_2 represents teaching motivation, a represents the constant, b_1 and b_2 represent the regression coefficients, and e represents the residual term. Individual predictor contributions were assessed using regression coefficients, standardized beta coefficients, t -values, and significance values. The overall model was assessed using the F statistic, R^2 , and adjusted R^2 . Because the study used a cross-sectional observational design, statistically significant coefficients were interpreted as evidence of statistical prediction or association rather than causal effects.

Table 1. Characteristics of Respondents

Characteristic	Category	n	%
Gender	Male	16	32.0%
	Female	34	68.0%
Age	< 30 years	8	16.0%
	30–39 years	22	44.0%
	40–49 years	14	28.0%
	≥ 50 years	6	12.0%
Highest qualification	Bachelor's degree	42	84.0%

	Master's degree	8	16.0%
Teaching experience	< 5 years	9	18.0%
	5–10 years	21	42.0%
	> 10 years	20	40.0%
Employment status	Civil servant/permanent teacher	33	66.0%
	Contract/non-permanent teacher	17	34.0%
Previous PjBL experience	Yes	38	76.0%
	No	12	24.0%

Source: Field Research, 2026

Results and Discussion

Result

Descriptive Statistics and Measurement Quality

The 50 teachers completed all three instruments. As shown in Table 2, Project-Based Learning (PjBL) scores averaged 211.80 (SD = 19.86), teaching motivation averaged 215.64 (SD = 20.12), and teacher performance averaged 215.64 (SD = 19.82).

Table 2. Descriptive Statistics and Instrument Reliability (n = 50)

Variable	Items	Mean	SD	Min–Max	Cronbach's α
Project-Based Learning (PjBL) (X1)	50	211.80	19.86	164–250	0.948
Teaching motivation (X2)	50	215.64	20.12	163–250	0.965
Teacher performance (Y)	50	215.64	19.82	167–250	0.965

All items were valid and each scale had strong internal consistency ($\alpha = 0.948 - 0.965$). Regression residuals met the documented normality criterion ($p = 0.182$). However, Project-Based Learning (PjBL) and teaching motivation were highly correlated ($r = 0.959$; tolerance = 0.080; VIF = 12.50), indicating substantial multicollinearity. Consequently, the partial coefficients below should be interpreted as conditional associations with limited precision rather than isolated causal effects.

Project-Based Learning as a Predictor of Teacher Performance

Controlling for teaching motivation, Project-Based Learning (PjBL) implementation had a positive and statistically significant association with teacher performance ($B = 0.224$, $SE = 0.105$, $\beta = 0.225$, $t = 2.138$, $p = 0.038$). The coefficient means that a one-point increase in the Project-Based Learning (PjBL) score was associated with a 0.224-point increase in predicted performance when motivation was held constant. The direction is consistent with the mechanism that planning authentic projects, organizing collaboration, monitoring progress, and using process-and-product assessment can strengthen teachers' planning and facilitation competencies (Irawan et al., 2023; Maçanova, 2025).

The descriptive pattern also indicates variation in teachers' understanding and consistency in applying PjBL. Some teachers had integrated project-based activities into

lesson planning and classroom implementation, particularly through activities emphasizing active student engagement and completion of project-based tasks. This variation is relevant because Project-Based Learning (PjBL) requires teachers to organize project stages, facilitate collaboration, monitor progress, and manage practical constraints rather than merely change the format of classroom activities (Nagy, 2025; Amir et al., 2025).

Teaching Motivation as a Predictor of Teacher Performance

Teaching motivation had a larger positive association with teacher performance after controlling for Project-Based Learning (PjBL) ($B = 0.750$, $SE = 0.103$, $\beta = 0.762$, $t = 7.252$, $p < 0.001$). A one-point increase in motivation was associated with a .750-point increase in predicted performance. The standardized coefficient indicates that motivation contributed more strongly than PjBL to the joint model, although the high overlap between predictors requires caution when comparing their unique effects. This pattern is theoretically plausible because motivated teachers are more likely to persist in preparation, classroom implementation, assessment, and professional development. Intrinsic interest sustains effort, while autonomy, competence, and relatedness support the confidence and commitment needed to adapt instruction under practical constraints. Motivation therefore operates as psychological energy that converts pedagogical knowledge into consistent professional behavior (Kumari & Kumar, 2023; Mayangsari et al., 2025).

The descriptive findings further indicate that teachers' motivation ranged from moderate to high, with most teachers showing a fairly strong internal drive to carry out teaching responsibilities. Motivation was reflected in readiness to develop instructional materials and conduct the teaching-learning process, although differences remained in relation to working conditions and the school environment (Adlaon et al., 2024; Kumari & Kumar, 2023). The result agrees with meta-analytic evidence that motivation is positively associated with elementary-school teacher performance (Effiyanti et al., 2023) and with studies linking internal drive to professional commitment (Kholifah et al., 2024). The present finding adds a direct comparison with PjBL implementation: motivation remained the dominant statistical predictor even when a specific innovative-learning practice was included.

Compared with studies that examine motivation or innovative learning separately, the present analysis places the two predictors in the same regression model. This is important because the statistical results indicate different unique contributions: motivation had the larger standardized coefficient, while PjBL retained a smaller but significant contribution. Thus, the findings support an integrated explanation rather than treating pedagogical practice and motivational conditions as interchangeable factors.

Practically, schools should not rely on training in PjBL procedures alone. Coaching should be accompanied by manageable workloads, access to project resources, collegial support, recognition, and opportunities for professional growth. These conditions can strengthen autonomy and competence while helping teachers sustain the additional planning and coordination demanded by PjBL (Sari & Komara, 2025). At the same time, the strong relationship between motivation and self-reported performance may partly reflect conceptual overlap and the use of a common response method. Future evaluations should combine questionnaires with independent classroom observations, principal ratings, or verified

performance records so that motivational perceptions and demonstrated performance are not measured solely by the same respondent.

Joint Prediction of Teacher Performance by PjBL and Teaching Motivation

The joint regression model was significant, $F(2, 47) = 543.097$, $p < 0.001$, with $R = 0.979$, $R^2 = 0.959$, adjusted $R^2 = 0.957$, and a standard error of estimate of 4.122. Thus, PjBL implementation and teaching motivation jointly accounted for 95.9% of the observed variance in teacher-performance scores. The estimated equation was $Y = 6.367 + 0.224X_1 + 0.750X_2$. Full coefficients are reported in Table 2.

Table 3. Multiple Linear Regression Predicting Teacher Performance

Predictor	B	SE	β	t	p
Constant	6.367	6.388	—	0.997	0.324
Project-Based Learning (PjBL)	0.224	0.105	0.225	2.138	0.038
Teaching motivation	0.750	0.103	0.762	7.252	< 0.001

The model confirms that pedagogical and motivational factors are jointly related to performance, but it does not imply that both have equal weight. Teaching motivation showed the larger standardized coefficient ($\beta = 0.762$), while PjBL retained a smaller independent contribution ($\beta = 0.225$). This suggests that teachers may understand or attempt PjBL, yet sustained performance depends strongly on the motivation to plan, adapt, and complete professional responsibilities.

The simultaneous result is consistent with the view that PjBL and teaching motivation complement one another. PjBL contributes concrete demands for planning, facilitation, collaboration management, monitoring, and assessment, while motivation supports the persistence and consistency required to enact those practices. The combination therefore provides a more comprehensive account of teacher performance than either pedagogical practice or motivational condition considered alone (Maritasari et al., 2022; Hollenstein & Brühwiler, 2024). The results support an integrated mechanism: PjBL specifies what teachers must organize in innovative instruction, whereas motivation influences the effort and consistency with which those practices are enacted. When teachers have both practical PjBL competence and motivational support, they are better positioned to facilitate active learning, manage projects, assess complex work, and reflect on implementation (Merdiaty & Sulistiasih, 2024; Zufahmi et al., 2022).

This interpretation is consistent with Maritasari et al. (2022), who found that project-based learning and motivation were associated with teacher competence and performance, and with Hollenstein and Brühwiler (2024), who emphasized the interaction of pedagogical and psychological teacher knowledge. The present study contributes census evidence from a North Jakarta elementary-school context and quantifies the relative contributions of the two predictors. The very high R^2 should nevertheless be interpreted conservatively. The census design accurately represents the 50 teachers in the three participating schools, but it does not ensure generalizability beyond that complex. Cross-sectional self-report measurement, potential common-method variance, and high predictor multicollinearity limit causal claims.

Future studies should use multi-source performance measures, report complete regression diagnostics, and replicate the model with larger samples across different districts.

Discussion

Project-Based Learning Implementation and Teacher Performance

The finding that PjBL implementation positively predicted teacher performance indicates that project-based instruction is associated with several core dimensions of teachers' professional work. The regression coefficient was positive and statistically significant ($B = 0.224$, $\beta = 0.225$, $t = 2.138$, $p = 0.038$). This result suggests that teachers who reported stronger implementation of PjBL also tended to report stronger performance after teaching motivation was considered in the model.

The relationship can be understood through the practical demands of PjBL. Implementing a project requires teachers to formulate authentic learning problems, organize project stages, facilitate student collaboration, monitor progress, provide feedback, and assess both processes and products. These activities require teachers to engage in systematic planning and classroom facilitation rather than relying primarily on direct instruction. Thus, PjBL may strengthen teacher performance by requiring the repeated enactment of pedagogical practices that are also reflected in core teacher-performance responsibilities.

This finding is consistent with Subiyantoro, who reported that project-based learning can support the professional abilities of prospective elementary school teachers (Subiyantoro, 2023). It also corresponds with Papan Yang, who found relationships between project-based learning, motivation, teacher competence, and performance (Yang et al., 2025). However, the present finding extends that evidence by examining PjBL implementation as one predictor alongside teaching motivation in a multiple regression model involving teachers in a specific elementary-school setting. The result therefore should not be interpreted as evidence that PjBL alone determines teacher performance, but as evidence that reported PjBL implementation retains a statistically significant contribution when motivation is included in the model.

The relatively smaller standardized coefficient for PjBL ($\beta = 0.225$) also provides an important qualification. The result suggests that pedagogical implementation is relevant, but its independent statistical contribution is smaller than that of teaching motivation in this sample. This indicates that strengthening PjBL should involve more than encouraging teachers to use projects. Professional development should specifically strengthen project design, facilitation, collaboration management, monitoring, and assessment competencies.

Teaching Motivation and Teacher Performance

Teaching motivation showed a stronger statistical contribution to teacher performance than PjBL implementation. The regression coefficient was $B = 0.750$, with $\beta = 0.762$, $t = 7.252$, and $p < 0.001$. Within the specified model, teachers with higher reported teaching motivation tended to report higher levels of teacher performance. The finding can be interpreted through the role of motivation in sustaining professional effort. Teaching responsibilities require continuous preparation, instructional adaptation, classroom management, assessment, reflection, and professional development. Motivation may therefore operate as a sustaining condition that helps teachers maintain effort and consistency when instructional tasks become demanding. A teacher may possess knowledge

of an innovative instructional model, but the consistent enactment of that model still requires willingness, persistence, and professional commitment.

The finding supports Dedeh Sariah, who identified a positive relationship between motivation and teachers' job performance (Sariah & Nugraha, 2024), and is also consistent with the meta-analytic evidence reported by Gittaria Octaviani (Octaviani et al., 2024). Ismail Nasar further emphasized the relationship between motivation, professional development, and teacher performance (Nasar et al., 2025). The present study adds context-specific evidence by examining motivation simultaneously with PjBL implementation rather than treating motivational conditions independently from pedagogical practice. However, the stronger coefficient for motivation should not be interpreted as proof that motivation is universally more important than PjBL. The result represents the relative standardized contribution of the two predictors within this particular sample and model. Because PjBL implementation and teaching motivation were highly correlated ($r = 0.959$), their unique contributions should be interpreted cautiously.

Joint Contribution of Project-Based Learning and Teaching Motivation

The simultaneous regression model was statistically significant, $F(2, 47) = 543.097$, $p < 0.001$, with $R^2 = 0.959$ and adjusted $R^2 = 0.957$. The model therefore accounted for 95.9% of the observed variance in teacher-performance scores. The result indicates that pedagogical implementation and motivational conditions are statistically related to teacher performance when considered together. The joint finding provides a more integrated interpretation of teacher performance. PjBL represents a set of instructional practices that require teachers to plan, facilitate, monitor, collaborate, and assess, whereas motivation provides the persistence and commitment required to perform these activities consistently. In this sense, the two predictors represent complementary dimensions: PjBL concerns the pedagogical practices teachers enact, while motivation concerns the conditions that support sustained professional effort.

The present finding can be compared with recent evidence concerning the relationship between innovative instructional practices and teacher performance. For example, Amir examined project-based learning and teacher performance among 300 teachers and found that the direct contribution of PjBL to performance was not statistically significant, although PjBL was positively related to compensation, which subsequently contributed to performance. (Amir et al., 2025). This differs from the present finding, in which PjBL implementation showed a statistically significant contribution to teacher performance ($\beta = 0.225$, $p = 0.038$). The difference may be attributable to variations in research context, measurement, and analytical model. While the present study examines PjBL implementation and teaching motivation as simultaneous predictors of teacher performance, Amir incorporated compensation as a mediating mechanism (Amir et al., 2025). This comparison suggests that the relationship between PjBL and teacher performance may not operate uniformly across contexts and may depend on the organizational conditions surrounding its implementation.

The findings have two practical implications. First, professional development related to PjBL should focus on specific competencies rather than simply increasing the frequency of project-based activities. Training should emphasize authentic project design, instructional

facilitation, collaborative learning management, progress monitoring, feedback, and assessment of project processes and products. Second, schools should strengthen conditions that support teachers' motivation, including opportunities for professional growth, recognition of professional contributions, autonomy in instructional decision-making, and supportive organizational environments. Theoretically, the findings suggest that teacher performance can be examined through the interaction of pedagogical and motivational dimensions. PjBL identifies the instructional practices teachers are required to perform, while motivation helps explain the persistence with which those practices are enacted. The present findings therefore support an integrated perspective in which teacher performance is not reduced to pedagogical competence alone or to motivational conditions alone.

Conclusion

The study concludes that both Project-Based Learning (PjBL) implementation and teaching motivation are positively and significantly associated with elementary school teacher performance in North Jakarta. Teaching motivation showed the stronger contribution ($\beta = 0.762$), compared with PjBL implementation ($\beta = 0.225$), while both predictors jointly explained 95.9% of the observed variance in teacher performance. These findings suggest that improving teacher performance requires not only strengthening PjBL implementation but also creating organizational conditions that support teachers' motivation and professional development. However, the results represent statistical associations within the participating schools and should not be interpreted as causal or broadly generalizable effects.

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