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# Artificial Intelligence Adoption and Teacher Performance: The Role of Leadership and Motivation in School Management

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**Abstract**

The rapid integration of digital technology in education has created new opportunities for improving teaching effectiveness and teacher performance. However, the successful implementation of technological innovation in education is influenced not only by technology adoption but also by organizational and motivational factors within schools. This study aims to analyze the influence of AI technology, principal leadership, and teacher motivation on teacher performance in East Lombok. This research employed a quantitative approach using multiple linear regression analysis to examine the relationships between the independent variables and teacher performance. Data were collected through questionnaires distributed to nine teachers selected through purposive sampling. The results indicate that AI technology has a significant positive influence on teacher performance with a regression coefficient of 0.588 and a significance value of 0.035. Meanwhile, principal leadership and teacher motivation show negative regression coefficients of −0.165 and −0.003 respectively, although their statistical influence remains significant. The regression model explains 84.2% of the variation in teacher performance, indicating a strong relationship between the variables examined in this study. These findings highlight the importance of integrating technological innovation with effective educational management strategies in order to improve teacher performance. The study suggests that educational institutions should strengthen the utilization of AI-based technologies while promoting leadership practices and motivational strategies that support teachers in adapting to digital transformation in education.

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## INTRODUCTION

The rapid advancement of digital technology has significantly transformed educational systems across the world, influencing how teaching and learning processes are organized and delivered. Educational institutions are increasingly encouraged to integrate digital technologies in order to improve instructional quality, accessibility, and learning outcomes (Piskun & Maksimchuk, 2025; Ripai et al., 2025; Sunitha Kanipakam, 2025). Reports from OECD highlight that the expansion of digital learning environments

and the integration of artificial intelligence in education are reshaping teaching practices and requiring teachers to develop new technological competencies in order to support innovative and adaptive learning systems (OECD, 2021). In this context, teachers are expected to adapt to technological developments while maintaining effective instructional practices. The integration of emerging technologies, including artificial intelligence (AI), has begun to reshape educational environments by supporting data-driven instruction, personalized learning, and automated assessment processes (Elazab, 2024; Singh, 2025; Yu, 2025). However, the successful implementation of technological innovation in education does not depend solely on technological availability. Organizational and managerial factors such as leadership practices and teacher motivation also play a critical role in shaping teacher performance, which remains one of the most important indicators of educational effectiveness.

Previous studies have examined the relationship between leadership, motivation, and teacher performance from various perspectives. Research on educational leadership emphasizes that effective leadership practices can create supportive organizational climates that enhance teacher engagement and instructional quality (Çilek et al., 2025; Kasih et al., 2024; Munte et al., 2022). Similarly, studies on teacher motivation highlight the importance of both intrinsic and extrinsic motivational factors in improving teacher commitment and professional performance (Haryadi, 2022; Moghtaderi Isfahani & Mehdad, 2022; Zhu, 2025). Alongside these managerial factors, recent research has increasingly focused on the role of digital technology in education. The integration of technology in teaching has been shown to support innovative instructional practices and improve the efficiency of learning management systems. For example, Lv et al. (2025) demonstrates that AI-supported learning environments can enhance instructional efficiency and facilitate personalized learning experiences. Likewise, Firmansyah & Wahdiniwaty (2023) emphasize that digital technologies can assist teachers in managing instructional tasks more effectively, particularly in the areas of assessment, feedback, and classroom management. Collectively, these studies suggest that leadership practices, teacher motivation, and technological innovation are key determinants of teacher performance in modern educational contexts.

Despite the growing body of literature on educational leadership and technology integration, several important gaps remain in the existing research. Most previous studies have examined leadership and motivation as independent determinants of teacher performance, while relatively few studies have explored the combined influence of leadership, motivation, and emerging technologies such as artificial intelligence. In addition, much of the existing research has been conducted in technologically advanced educational environments, leaving limited empirical evidence regarding how these factors interact in developing regions where technological integration is still evolving. This limitation indicates the need for further research that investigates how technological and managerial factors jointly influence teacher performance in diverse educational contexts. Addressing this gap is essential for understanding how educational institutions can effectively integrate technological innovation within their management strategies to improve teaching performance.

Based on these considerations, this study aims to analyze the influence of AI technology, principal leadership, and teacher motivation on teacher performance in East Lombok. By examining the interaction between technological and organizational factors, this research seeks to contribute to the broader discourse on educational management

in the digital era. Specifically, the study investigates how the use of AI technology in instructional activities, leadership practices within schools, and motivational dynamics among teachers collectively influence teacher performance. The findings of this study are expected to provide empirical insights that can support the development of more effective educational management strategies for improving teacher performance in technology-driven learning environments.

Furthermore, this study emphasizes the importance of understanding teacher performance as a multidimensional phenomenon shaped by technological capabilities, leadership approaches, and motivational mechanisms. The central argument of this research is that the effective management of teacher performance in contemporary educational institutions requires the integration of technological innovation with supportive leadership and motivational strategies. By exploring these relationships within the context of East Lombok, this study seeks to provide a deeper understanding of how technological and managerial factors interact in shaping teacher performance. The insights generated from this research may contribute to the development of more adaptive and technology-responsive educational management practices, particularly in regions undergoing rapid digital transformation in the education sector.

## RESEARCHS METHOD

This study employed a quantitative research approach using a correlational design to examine the influence of AI technology, principal leadership, and teacher motivation on teacher performance. A quantitative approach was selected because it enables researchers to measure relationships between variables and test hypotheses using statistical analysis (Gonzalez-Herrera, 2023; Mweshi & Muhyila, 2024; Weyant, 2022). The correlational design is particularly suitable for identifying the degree of association between independent variables and a dependent variable without manipulating the research environment (Magsino, 2021). The research was conducted in East Lombok Regency, Indonesia, where the integration of digital technology in education has increasingly become a strategic priority in improving teaching quality. Within this context, teachers are expected to adapt to technological advancements while maintaining effective instructional practices. Therefore, examining the relationship between AI technology utilization, leadership practices, and motivational factors becomes important for understanding how these elements contribute to teacher performance in contemporary educational settings.

The population of this study consisted of teachers working in schools located in East Lombok Regency. From this population, a sample of nine teachers was selected using a purposive sampling technique. Purposive sampling was chosen because it allows researchers to select participants who meet specific criteria relevant to the objectives of the study (Iliyasu & Etikan, 2021; Suryani & Herianti, 2023; Susilowati et al., 2024). In this case, the selected teachers were those who were actively involved in teaching activities and had experience using digital or technology-assisted learning tools. Although the sample size is relatively limited, the selected respondents were considered capable of providing relevant information regarding the use of AI technology in teaching, the leadership practices of school principals, and motivational aspects influencing their professional performance. The participants were therefore regarded as appropriate representatives for examining the relationships among the variables investigated in this study.

This study examined four main variables: AI Technology ($X_1$), Principal Leadership ($X_2$), Motivation ($X_3$), and Teacher Performance (Y). Data were collected using a structured questionnaire designed to measure the perceptions of teachers regarding these variables. The questionnaire employed a five-point Likert scale, ranging from strongly disagree to strongly agree, to capture respondents' levels of agreement with each statement (Robie et al., 2022; Zhang et al., 2023). Each variable was operationalized into measurable indicators based on relevant theoretical frameworks in educational management and technology integration. The operational definitions of the variables used in this study are presented in **Table 1**.

**Table 1. Operational Definition of Variables**

| Variable | Conceptual Definition | Indicators | Sample Measurement Items | Scale |
|---|---|---|---|---|
| AI Technology | The use of artificial intelligence tools to support teaching, learning, and assessment processes in educational settings. | AI-assisted teaching tools, automated assessment, technology-supported learning | Teachers use AI-based tools to support teaching activities; AI applications assist in evaluating student assignments. | Likert Scale (1–5) |
| Principal Leadership | The ability of school principals to guide, supervise, and support teachers in achieving educational goals. | Instructional supervision, communication, leadership support | The principal provides clear direction for teaching activities; the principal supports teachers in improving instructional practices. | Likert Scale (1–5) |
| Motivation | Internal and external factors that encourage teachers to perform their professional duties effectively. | Intrinsic motivation, extrinsic motivation, professional commitment | Teachers feel motivated to improve the quality of their teaching; recognition from the school motivates teachers to perform better. | Likert Scale (1–5) |
| Teacher Performance | The effectiveness of teachers in planning, implementing, and evaluating teaching and learning activities. | Lesson planning, instructional implementation, learning evaluation | Teachers prepare lesson plans before teaching; teachers regularly evaluate student learning outcomes. | Likert Scale (1–5) |

As shown in **Table 1**, each variable was measured through several indicators reflecting its conceptual dimensions. These indicators were translated into questionnaire items and assessed using a five-point Likert scale to capture respondents' perceptions systematically.

The data collected through the questionnaire were analyzed using multiple linear regression analysis with the assistance of SPSS statistical software. Multiple linear regression was chosen because it allows researchers to examine the simultaneous and partial influence of several independent variables on a dependent variable (Bai et al., 2023; M. Li et al., 2022; Z. Li & Yi, 2024). In this study, the analysis was conducted to determine the extent to which AI technology, principal leadership, and motivation influence teacher performance. Before conducting the regression analysis, several classical assumption tests were performed to ensure the validity of the regression model. These tests included multicollinearity testing, heteroscedasticity testing, and autocorrelation testing.

After confirming that the data met the required assumptions, regression analysis was performed. The analysis involved the t-test to examine the partial effect of each independent variable, the F-test to evaluate the simultaneous influence of the independent variables, and the coefficient of determination ($R^2$) to assess the explanatory power of the regression model (Claeskens & Jansen, 2023; Frahm, 2023; Tian & Feng, 2023).

## RESULT AND DISCUSSION

### Result

#### Descriptive Statistics

Descriptive statistics were conducted to provide an overview of the distribution of the research variables, including teacher performance, AI technology, principal leadership, and teacher motivation. The results of the descriptive statistical analysis are presented in **Table 2**.

**Table 2. Descriptive Statistics of Research Variables**

| Variable | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| Teacher Performance | 4.790 | 6.23 | 5.47 | 0.12501 |
| AI Technology | 0.890 | 1.36 | 1.09 | 0.43812 |
| Principal Leadership | 55.490 | 59.20 | 56.98 | 1.000 |
| Motivation | 434.865 | 501.37 | 472.75 | 0.791 |

As shown in **Table 2**, teacher performance has a mean value of 5.47 with a relatively small standard deviation (SD = 0.12501), indicating that the variation of responses among participants is relatively low. AI technology shows an average value of 1.09, while principal leadership and motivation have mean scores of 56.98 and 472.75, respectively. Overall, the descriptive statistics indicate that the responses across the observed variables are relatively consistent among the respondents.

#### Multicollinearity Test

Multicollinearity testing was conducted to examine whether strong correlations exist among the independent variables included in the regression model. The results of the multicollinearity test are presented in **Table 3**.

**Table 3. Multicollinearity Test Results**

| Variable | Tolerance | VIF |
|---|---|---|
| AI Technology | 0.411 | 2.435 |
| Principal Leadership | 0.395 | 2.534 |
| Motivation | 0.420 | 2.383 |

As shown in **Table 3**, all tolerance values are greater than 0.10, and the Variance Inflation Factor (VIF) values for all independent variables are below 10. These findings indicate that there is no multicollinearity problem among the independent variables in the regression model, suggesting that AI Technology, Principal Leadership, and Motivation can be included simultaneously in the regression analysis.

## Multiple Linear Regression Analysis

To examine the influence of AI Technology, Principal Leadership, and Motivation on Teacher Performance, a multiple linear regression analysis was conducted. The statistical output of the regression model is presented in **Table 4**.

**Table 4. Multiple Linear Regression Results**

| Type | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | T | Sig. | Tolerance | VIVID |
| 1 | (Constant) | 15.719 | 19.585 | | .803 | .459 | | |
| | AI Technology | .588 | 1.641 | .240 | .358 | .035 | .411 | 2.435 |
| | Leadership | -.165 | .280 | -.402 | -.587 | .023 | .395 | 2.534 |
| | Motivation | -.003 | .013 | -.161 | -.243 | .018 | .420 | 2.383 |

a. Dependent Variable:

Based on the regression analysis presented in **Table 4**, the regression equation can be formulated as follows:

$$Y = 15.719 + 0.588X_1 - 0.165X_2 - 0.003X_3 + e$$

where $Y$ represents Teacher Performance, $X_1$represents AI Technology, $X_2$represents Principal Leadership, and $X_3$represents Motivation. The results indicate that AI Technology has a positive and significant effect on Teacher Performance (B = 0.588; p = 0.035). This finding suggests that increased utilization of AI technology contributes to improved teacher performance. In contrast, Principal Leadership shows a negative coefficient (B = −0.165; p = 0.023), indicating an inverse relationship with teacher performance in this model. Similarly, Motivation also demonstrates a negative coefficient (B = −0.003; p = 0.018), although the magnitude of its effect is relatively small. Additionally, the tolerance and VIF values presented in Table 2 indicate that all independent variables meet the acceptable thresholds (Tolerance > 0.10 and VIF < 10), suggesting that multicollinearity is not present in the regression model.

## Coefficient of Determination

The explanatory power of the regression model was evaluated using the coefficient of determination. The results of the model summary are presented in **Table 5**.

**Table 5. Model Summary**

| R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin–Watson |
|---|---|---|---|---|
| 0.918 | 0.842 | 0.807 | 3.421 | 2.436 |

As presented in **Table 5**, the regression model shows a strong relationship between the independent variables and teacher performance (R = 0.918). The R Square value of 0.842 indicates that approximately 84.2% of the variation in teacher performance can be explained by AI Technology, Principal Leadership, and Motivation. The Adjusted R Square value of 0.807 further confirms that the model maintains strong explanatory capability even after adjusting for the number of predictors included in the analysis.

**Autocorrelation Test**

The independence of residuals was examined using the Durbin–Watson statistic, which is also presented in **Table 5**. The Durbin–Watson value obtained is 2.436, which is close to the standard reference value of 2. This result indicates that no significant autocorrelation problem exists in the regression model, suggesting that the residuals are independent and that the regression assumptions related to autocorrelation are satisfied.

**Simultaneous Test (ANOVA)**

To determine whether the independent variables simultaneously influence teacher performance, an ANOVA test was conducted. The results are summarized in **Table 6**.

**Table 6. ANOVA Test Results**

| Type | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| [1] Regression | .125 | 3 | .042 | .136 | .035a |
| Residual | 1.536 | 5 | .307 | | |
| Total | 1.661 | 8 | | | |

a. Predictors: (Constant),
b. Dependent Variable:

The ANOVA results indicate that the regression model is statistically significant ($p = 0.035 < 0.05$). This finding suggests that AI Technology, Principal Leadership, and Motivation simultaneously influence Teacher Performance. Although the F value obtained in the model is relatively small, the significance level indicates that the independent variables collectively contribute to explaining variations in teacher performance.

**Heteroscedasticity Test**

A heteroscedasticity test was performed using a scatterplot of standardized residuals against predicted values. The results are illustrated in **Figure 1**.

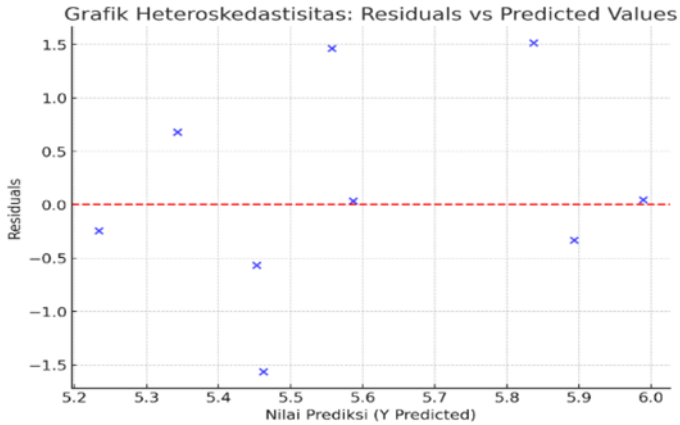


**Figure 1. Scatterplot of Residuals and Predicted Values**

The scatterplot shows that the residual points are randomly distributed around the zero line without forming a clear or systematic pattern. This indicates that the regression model does not exhibit heteroscedasticity, and therefore the assumption of homoscedasticity is satisfied.

## Discussion

This study was conducted to examine the influence of AI technology, principal leadership, and teacher motivation on teacher performance in East Lombok. The increasing integration of digital technology in education has encouraged schools to adapt their management strategies in order to maintain instructional quality and organizational effectiveness. Within the context of educational management, teacher performance represents a key indicator of institutional effectiveness, as it directly affects the quality of teaching and learning processes. Therefore, understanding the managerial and technological factors that influence teacher performance becomes essential for improving educational outcomes. This study contributes to the growing body of literature on educational management by exploring how technological innovation, leadership practices, and motivational factors interact in shaping teacher performance in the context of digital transformation in education.

The results indicate that AI technology has a positive and significant influence on teacher performance. This finding suggests that the integration of AI-based tools can enhance teachers' effectiveness in performing instructional tasks such as lesson preparation, student assessment, and classroom management. The evidence of this study supports the argument that technological innovation can improve the efficiency and quality of teaching activities. This result aligns with the findings of Singh (2025), who reported that the use of AI-supported educational systems can enhance teaching effectiveness and support personalized learning processes. Similarly, Piskun (2025) emphasize that digital technology enables teachers to optimize instructional planning and evaluation processes. From a management perspective, these findings highlight the importance of integrating AI technology into school management strategies, particularly in supporting data-driven decision-making and improving the overall management of teaching and learning activities.

Interestingly, the findings also reveal that principal leadership has a negative relationship with teacher performance. Although leadership is generally considered a critical factor in improving teacher effectiveness, the results of this study indicate that certain leadership practices may not always lead to positive outcomes. This finding contrasts with the study conducted by Chulaelah & Setya (2025), which reported that effective principal leadership positively influences teacher performance. One possible explanation for this discrepancy is the variation in leadership styles across different institutional contexts. Leadership approaches that emphasize excessive control, rigid supervision, or limited teacher autonomy may reduce teachers' ability to innovate and adapt their teaching practices (Hsieh et al., 2025; Oktavia et al., 2022; Utami et al., 2024). Within the framework of educational management, this finding suggests that school leaders should adopt more participatory and transformational leadership approaches that encourage collaboration, professional development, and teacher autonomy. Such leadership practices are essential for creating a supportive organizational climate that fosters continuous improvement in teaching performance.

The results also indicate that teacher motivation has a negative but relatively small influence on teacher performance. Although motivation is commonly viewed as a key factor in improving professional performance, the findings of this study suggest that motivation alone may not be sufficient to enhance teacher effectiveness. This result partially supports the work of Susilowati (2024), who argue that the relationship between motivation and performance is strongly influenced by contextual factors such

as organizational support, leadership practices, and access to professional resources. In certain educational settings, motivation driven primarily by external pressure or administrative expectations may not necessarily translate into improved instructional performance (Gonzalez-Herrera, 2023). Therefore, improving teacher performance requires a more comprehensive management approach that combines motivational support with effective leadership practices and adequate technological infrastructure.

From the perspective of educational management, this study provides several important practical contributions. First, the findings emphasize the strategic role of AI technology as a managerial tool that can enhance teaching efficiency and support instructional decision-making. Educational institutions should therefore invest in technological infrastructure and provide training programs that enable teachers to effectively utilize AI-based learning tools. Second, the results highlight the need for school leaders to adopt leadership practices that empower teachers rather than restrict their professional autonomy. Effective educational management should prioritize collaboration, innovation, and professional development as key components of teacher performance management. Third, the study underscores the importance of integrating technological support, leadership strategies, and motivational mechanisms into a comprehensive management framework that promotes sustainable improvement in teaching quality.

## CONCLUSION

The growing integration of digital technology in education has created new challenges and opportunities for improving teacher performance. This study examined the influence of AI technology, principal leadership, and teacher motivation on teacher performance in East Lombok. The findings indicate that AI technology has a positive and significant influence on teacher performance, suggesting that the effective use of AI-based tools can support teachers in managing instructional activities more efficiently. In contrast, principal leadership and teacher motivation show negative relationships with teacher performance in this study, indicating that leadership practices and motivational mechanisms may not always produce positive outcomes when they are not supported by appropriate organizational conditions and management strategies.

These findings highlight the importance of integrating technological innovation with effective educational management practices. For practical application, schools should strengthen the use of AI technology in teaching while promoting leadership approaches that support teacher autonomy, collaboration, and professional development. Educational institutions are also encouraged to design management strategies that combine technological support, leadership effectiveness, and teacher capacity building. Future research should involve larger samples and explore additional variables such as digital leadership, organizational culture, and professional learning communities in order to better understand the factors that influence teacher performance in technology-driven educational environments.

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## REFERENCES


Bai, Y., Zhang, Y., & Liu, C. (2023). Moderate Deviation Principle for Likelihood Ratio Test in Multivariate Linear Regression Model. *Journal of Multivariate Analysis, 194*. https://doi.org/10.1016/j.jmva.2022.105139

Chulaelah, S. Y., & Setya Raharja. (2025). The Effect of Principal Leadership and Teacher Competence on Teacher Performance with Learning Management as a Mediating Variable. *Lembaran Ilmu Kependidikan, 54*(1), 21–29. https://doi.org/10.15294/lik.v54i1.21402

Çilek, A., Kılınç, A. Ç., Erdoğan, O., Arslan, K., & Sezgin, F. (2025). Linking Principal Support and Teacher Resilience to Teacher Leadership in Türkiye: The Mediating Role of Teacher Work Engagement. *Educational Management Administration and Leadership*. https://doi.org/10.1177/17411432241308679

Claeskens, G., & Jansen, M. (2023). Comments on: Statistical Inference and Large-Scale Multiple Testing for High-Dimensional Regression Models. *Test, 32*(4), 1177–1179. https://doi.org/10.1007/s11749-023-00896-5

Elazab, M. (2024). AI-Driven Personalized Learning. *International Journal of Internet Education, 22*(3), 6–19. https://doi.org/10.21608/ijie.2024.350579

Firmansyah, D., & Wahdiniwaty, R. (2023). Happiness Management: Theoretical, Practical and Impact. *International Journal of Business, Law, and Education, 4*(2), 747–756. https://doi.org/10.56442/ijble.v4i2.244

Frahm, G. (2023). A Test for the Validity of Regression Models. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4610329

Gonzalez-Herrera, R. (2023). An Approximation to Statistical Analysis of Recession Curves of a Karst System in a Plain. *Journal of Quantitative and Statistical Analysis*, 30–43. https://doi.org/10.35429/jqsa.2023.26.10.30.43

Haryadi, D. (2022). Meningkatkan Employe Performance dengan Extrinsic Motivation dan Interpersonal Trust melalui Organizational Commitment. *ECo-Buss, 4*(3), 660–675. https://doi.org/10.32877/eb.v4i3.335

Hsieh, C. C., Song, Y., & Li, H. C. (2025). Analyzing the Relationship between Distributed Leadership and Instructional Quality in Taiwan: The Mediating Roles of Teacher Autonomy and Teacher Innovation. *Educational Management Administration and Leadership, 53*(5), 1153–1171. https://doi.org/10.1177/17411432241231421

Iliyasu, R., & Etikan, I. (2021). Comparison of Quota Sampling and Stratified Random Sampling. *Biometrics & Biostatistics International Journal, 10*(1), 24–27. https://doi.org/10.15406/bbij.2021.10.00326

Kasih, E. W., Sohnui, S., & Mundilarno, M. (2024). Exploring the Influence of Principal Supervision, Organizational Climate, and Teacher Teaching Experience on Teacher Performance. *Indonesian Journal of Educational Management and Leadership, 2*(2), 121–135. https://doi.org/10.51214/ijemal.v2i2.1007

Li, M., Wang, K., Maity, A., & Staicu, A. M. (2022). Inference in Functional Linear Quantile Regression. *Journal of Multivariate Analysis, 190*. https://doi.org/10.1016/j.jmva.2022.104985

Li, Z., & Yi, Z. (2024). Exploring the Association between Bilibili's Post-IPO Quarterly Stock Price and Multivariate Factors: A Multiple Linear Regression Analysis. *Advances in Economics, Management and Political Sciences, 89*(1), 29–39. https://doi.org/10.54254/2754-1169/89/20231517

Lv, P., Wang, X., Nie, Y., Wu, R., & Wang, L. (2025). Exploring the Factors Influencing College Students' Learning Satisfaction in Generative AI-Supported MOOCs Learning Environment: A Learning Experience Framework Perspective. *Frontiers in Psychology, 16*. https://doi.org/10.3389/fpsyg.2025.1633686

Magsino, L. (2021). Self-Regulation Learning Variables and Learners' Performance: A Correlational Analysis. *International Review of Social Sciences Research, 1*(1), 34–57. https://doi.org/10.53378/346498

Moghtaderi Isfahani, A., & Mehdad, A. (2022). Mediating Role of Intrinsic Work Motivation in Relationship between Job Commitment and Professional Ethics with Firefighters' Extra-Role Performance. *Occupational Medicine*. https://doi.org/10.18502/tkj.v13i3.8195

Munte, R. N., Siagian, E. M., Sihombing, D. R., & Susanti, D. (2022). Role of Principal Leadership Engagement, Organizational Climate, Job Satisfaction on Teacher Organizational Commitment. *Dinamika Pendidikan, 17*(1), 1–11. https://doi.org/10.15294/dp.v17i1.31558

Mweshi, G. K., & Muhyila, M. (2024). Determining a Statistical Analysis for the Quantitative Study in Research. *Advances in Social Sciences Research Journal, 11*(7), 187–231. https://doi.org/10.14738/assrj.117.17018

OECD. (2021). OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots. *OECD Digital Education Outlook, 2021*. OECD Publishing. https://doi.org/10.1787/589b283f-en

Oktavia, R. L., Yusuf, M., & Suwardana, H. (2022). The Effect of Leadership Style and Work Environment on Teacher Performance. *Innovation Research Journal, 3*(1), 64. https://doi.org/10.30587/innovation.v3i1.3939

Piskun, E. S., & Maksimchuk, U. A. (2025). Digital Accessibility of Educational Information Content Taking into Account the Web Content Accessibility Guidelines. *Digital Transformation, 31*(2), 59–68. https://doi.org/10.35596/1729-7648-2025-31-2-59-68

Ripai, A., Andayani, & Wardani, N. E. (2025). Digital Textbooks in Drama Education: Improving Accessibility and Quality of Literature Learning through Integration of Local Wisdom. *Educational Process: International Journal, 15*. https://doi.org/10.22521/edupij.2025.15.126

Robie, C., Meade, A. W., Risavy, S. D., & Rasheed, S. (2022). Effects of Response Option Order on Likert-Type Psychometric Properties and Reactions. *Educational and Psychological Measurement, 82*(6), 1107–1129. https://doi.org/10.1177/00131644211069406

Singh, A. (2025). The Future of Learning: AI-Driven Personalized Education. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5076438

Sunitha Kanipakam. (2025). Enhancing Educational Equity and Accessibility through Digital Learning: A Pathway to Quality and Legally Empowered Education for Society. *Journal of Information Systems Engineering and Management, 10*(46s), 932–939. https://doi.org/10.52783/jisem.v10i46s.9098

Suryani, A., & Herianti, E. (2023). Purposive Sampling Technique and Ordinary Least Square Analysis: Investigating the Relationship between Managerial Overconfidence, Transfer Pricing and Tax Management in Indonesian Stock Exchange-Listed Firms. *International Journal of Professional Business Review, 8*(8), e02684. https://doi.org/10.26668/businessreview/2023.v8i8.2684

Susilowati, L., Sulastriningsih, K., Nurlelawati, E., & Rosmiati. (2024). Analisis Hubungan antara Imunisasi BCG dan Kejadian Tuberkolosis pada Anak Usia 1–4 Tahun dengan Metode Purposive Sampling. *Technomedia Journal, 9*(1), 46–60. https://doi.org/10.33050/tmj.v9i1.2227

Tian, Y., & Feng, Y. (2023). Comments on: Statistical Inference and Large-Scale Multiple Testing for High-Dimensional Regression Models. *Test, 32*(4), 1172–1176. https://doi.org/10.1007/s11749-023-00880-z

Utami, F. M., Nevi Latina, N. L., Miko Frenanda, M. F., Insyra Nung Fatikha, I. N. F., M. Fadhil Parhan, M. F. P., Ferdiaz Saudagar, F. S., & Muttaqin, A. S. (2024). The Role of Transformational Leadership Style, Knowledge, Innovation, Motivation towards Teacher Performance. *Indonesian Educational Administration and Leadership Journal (IDEAL), 6*(2), 58–79. https://doi.org/10.22437/ideal.v6i2.38545

Weyant, E. (2022). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 5th Edition. *Journal of Electronic Resources in Medical Libraries, 19*(1–2), 54–55. https://doi.org/10.1080/15424065.2022.2046231

Yu, X. (2025). Visual Recognition in Art Education: Enhancing Creativity, Assessment, and Personalized Learning through AI-Driven Technologies. *International Journal of Advanced Research and Interdisciplinary Scientific Endeavours, 2*(3), 512–518. https://doi.org/10.61359/11.2206-2512

Zhang, X., Zhou, L., & Savalei, V. (2023). Comparing the Psychometric Properties of a Scale across Three Likert and Three Alternative Formats: An Application to the Rosenberg Self-Esteem Scale. *Educational and Psychological Measurement, 83*(4), 649–683. https://doi.org/10.1177/00131644221111402

Zhu, Y. (2025). Does Intrinsic Motivation Promote Better Academic Performance than Extrinsic Motivation among High School Students? *Lecture Notes in Education Psychology and Public Media, 124*(1), 145–152. https://doi.org/10.54254/2753-7048/2026.ht30751