






IMPROVING THE PERFORMANCE OF EDUCATION TEACHERS IN THE MERDEKA CURRICULUM: THE ROLE OF LEADERSHIP, SCHOOL CLIMATE, AND JOB SATISFACTION

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Abstract

The implementation of the Merdeka Curriculum in Indonesia demands high teacher performance, especially for physical education (PE) teachers, who must adopt differentiated, student-centered learning approaches. This study aims to analyze the effects of principal leadership, school climate, and teacher job satisfaction on the performance of PE teachers in implementing the curriculum. A quantitative ex post facto design was employed, involving 30 principals and 30 teachers, with data collected via structured questionnaires and analyzed using path analysis. The results show that principal leadership contributed 36.6%, school climate 42.3%, and job satisfaction 50.5% to teacher performance. These findings highlight the crucial role of transformational leadership, a positive school environment, and job satisfaction in curriculum success. The novelty of this study lies in its focus on PE teachers—an area underexplored in Merdeka Curriculum research. The study provides practical implications for educational policymakers and school leaders to enhance curriculum implementation through leadership development and the cultivation of supportive school environments. Ultimately, the findings emphasize that optimizing PE teacher performance requires a comprehensive approach that integrates organizational, emotional, and instructional supports.

Keywords Merdeka Curriculum, Job Satisfaction, Principal Leadership, School Climate, Teacher Performance.



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INTRODUCTION

The Indonesian education system has undergone major reforms over the past decade, culminating in the introduction of the Merdeka Curriculum (Kurikulum Merdeka) (Lutfi Altahayneh et al., 2014; Laila et al., 2025). This curriculum redefines the role of teachers as facilitators of

contextualized, student-centered, and project-based learning (Böke & NORMAN, 2022). In contrast to previous curricula which were more prescriptive and standardized, the Merdeka Curriculum provides autonomy and flexibility to educators in designing lesson plans that align with students' interests, abilities, and local culture (Theresa et al., 2019; Hunaepi & Suharta, 2024; Anugradia et al., 2025; Ikhsan et al., 2025; Jarnawi et al., 2025). This shift brings not only pedagogical freedom but also substantial instructional and administrative responsibilities, particularly for Physical Education (PE) teachers who must integrate physical literacy with cognitive and character development (Bessa et al., 2021; Eirín-Nemiña et al., 2022; Jalmasco et al., 2025; Kheang et al., 2025). However, while the Merdeka Curriculum places high expectations on teacher competence, commitment, and innovation, few studies have explored the specific organizational and psychological conditions that determine teacher performance in this new educational landscape.

This study is grounded in the need to address several crucial gaps in the current body of research. First, although various scholars have investigated teacher performance in general, most have not focused on PE teachers who face distinct instructional challenges compared to their peers in academic subjects. PE instruction under the Merdeka Curriculum demands a combination of movement-based learning, inclusive practices, and reflective teaching strategies that foster the values of Pancasila student profiles (Mouloud et al., 2016; Nascimento et al., 2016). Despite this, empirical research that centers on PE teacher performance within the framework of educational reform remains scarce (Prasetijo & Samidjo, 2019; Simaremare et al., 2023; Jumaera et al., 2024; Nou et al., 2025). Second, existing studies on school leadership, school climate, and job satisfaction often examine these variables in isolation. A comprehensive model that integrates these factors and explores how they interact to influence teacher performance, especially in PE settings, is lacking (Aygün, 2021; Rahmah et al., 2021; Salamah et al., 2023; Obenza et al., 2025; Putri et al., 2025). The absence of such integrative models creates a limited understanding of how school organizational factors translate into improved classroom practices and learning outcomes.

The urgency of this research is further underscored by the pressures PE teachers face in adapting to reform mandates without clear guidance or institutional support. While the curriculum offers freedom, it also assumes that teachers are self-motivated, professionally competent, and emotionally resilient assumptions that are not always supported by the realities on the ground (Ridwan et al., 2024; Muspawi et al., 2025). School leaders, as agents of change, are expected to bridge this gap by providing vision, resources, and emotional encouragement (Balga & Antala, 2022). Transformational leadership has been consistently linked with improvements in teacher motivation, job satisfaction, and instructional quality (Berkovich & Eyal, 2017; Bush, 2018; Morris et al., 2020). Yet, in the context of PE teaching, which is often marginalized in school planning, the extent to which leadership can influence teacher performance remains an open question. In parallel, a positive school climate—marked by collegiality, trust, shared norms, and effective communication—has been shown to enhance teacher engagement and collaborative behavior (Salamah et al., 2023; Marini et al., 2024; Rachmatika & Salighehdar, 2024; Rubio et al., 2025; Salim et al., 2025), but its specific impact on PE contexts has not been clearly established.

Moreover, job satisfaction plays a central mediating role in educational performance. Teachers who experience autonomy, recognition, adequate workload distribution, and professional growth opportunities are more likely to feel satisfied and committed to their roles (Doğan et al., 2018; Silitonga et al., 2020). Job satisfaction has been found to buffer the effects of stress and burnout, conditions commonly experienced during times of educational reform (Yan et al., 2022; Zhengkang & Yaakob, 2025). However, despite this established link, little is known about how satisfaction interacts with leadership and climate to influence PE teacher performance under the Merdeka Curriculum (Basalamah & As'ad, 2021; Somantri, 2024; Siddique et al., 2025). These conceptual voids create an empirical and theoretical opportunity to develop a structural framework that incorporates all three variables and maps their direct and indirect effects on teaching effectiveness.

This study responds to the above concerns by developing a path analysis model that connects principal leadership, school climate, and teacher job satisfaction with the performance of PE teachers in implementing the Merdeka Curriculum. The study aims to answer the following research questions: (1) To what extent does principal leadership influence teacher job satisfaction and performance? (2) How does school climate contribute to teacher satisfaction and effectiveness? (3) Does job satisfaction mediate the relationship between leadership and teacher performance? By applying a quantitative ex post facto design and structural equation modeling, this research will quantify the causal relationships

among these variables, offering both theoretical insights and practical recommendations. The expected outcomes will inform school administrators and policymakers on how to structure professional environments that support teacher excellence and sustain curriculum reform.

The significance of this study lies not only in its methodological innovation but also in its focus on a neglected population—PE teachers—within a policy area that is critical to national development goals. Improving PE teacher performance through leadership, climate, and satisfaction interventions is essential for realizing the holistic competencies envisioned by the Merdeka Curriculum (Claassen & Broding, 2019; Mudjisusatyo et al., 2024). Furthermore, by situating the research in an Indonesian context, this study contributes localized evidence to the global discourse on teacher development under education reform.

RESEARCH METHOD

This study employed a quantitative approach with an ex post facto design. The rationale for choosing this approach is to investigate causal relationships without manipulating the Merdeka variables, relying on empirical data that reflects real conditions in the field. The main objective is to develop and validate a structural model connecting principal leadership, school climate, teacher job satisfaction, and the performance of physical education (PE) teachers in implementing the Merdeka Curriculum.

The population of this study comprised PE teachers and school principals from public elementary schools in Langsa City, Aceh Province, Indonesia, that had implemented the Merdeka Curriculum. A simple random sampling technique was applied, involving 30 PE teachers and 30 school principals. According to Cohen's (1988) power analysis table, this sample size is adequate for path analysis involving three exogenous variables and one endogenous variable, with medium effect size ($f^2 = 0.15$), statistical power ≥ 0.80 , and significance level $\alpha = 0.05$. Therefore, the statistical power of this study is considered sufficient to detect significant causal relationships.

Data were collected using a structured closed-ended questionnaire based on a 5-point Likert scale, ranging from “Strongly Disagree” to “Strongly Agree.” The instrument was developed based on relevant theoretical constructs and previous empirical studies. Each construct was operationalized through multiple indicators as outlined in the following instrument blueprint:

Table 1. Instrumen items

Variable	Indicators	Number of Items
Principal Leadership (X1)	Vision and mission, teacher empowerment, supervision and evaluation, participatory decision-making	14
School Climate (X2)	Collegiality, trust, school norms and values, communication, principal support	13
Job Satisfaction (X3)	Work recognition, workload balance, professional growth, life-work harmony	12
Teacher Performance (X4)	Lesson planning, instructional implementation, student involvement, assessment practices	12

The questionnaire was pilot-tested on 15 PE teachers outside the sample to examine item validity and reliability. Pearson product-moment correlation was used to evaluate content validity, and Cronbach's Alpha was employed for reliability testing. All items met the required correlation ($r > 0.30$) and internal consistency standards ($\alpha \geq 0.80$), indicating strong reliability.

The research was conducted in several phases: (1) constructing and validating the questionnaire through expert judgment, (2) conducting a pilot test and revising items, (3) administering the finalized questionnaire to selected respondents, (4) collecting and organizing the data, (5) conducting statistical assumption tests, and (6) analyzing data using structural equation modeling. Respondents completed the questionnaire Merdekaly after receiving brief instructions and consent forms.

The collected data were analyzed using both descriptive and inferential statistics. Descriptive statistics included means, standard deviations, and frequency distributions to provide an overview of the

data. Inferential statistics involved path analysis using SPSS and AMOS software to examine the causal relationships between variables. Before running the main analysis, the assumptions of normality, linearity, and multicollinearity were tested. Normality was assessed using the Kolmogorov–Smirnov test; linearity was examined via scatterplots; and multicollinearity was checked through tolerance values and Variance Inflation Factors (VIF). Structural model testing employed covariance-based Structural Equation Modeling (CB-SEM), with model fit indices including Chi-square, Root Mean Square Error of Approximation (RMSEA < 0.08), Comparative Fit Index (CFI > 0.90), Tucker-Lewis Index (TLI > 0.90), and Goodness of Fit Index (GFI > 0.90). Bootstrapping was also performed to estimate indirect effects and test the mediating role of job satisfaction. The analysis followed the guidelines provided by Hair et al. (2014) for model evaluation.

Given a sample size of 60 respondents and four latent variables in the path model, this study fulfills the minimum sample size requirement for achieving sufficient statistical power. With an assumed medium effect size ($f^2 = 0.15$) and $\alpha = 0.05$, the power exceeds 0.80, according to Cohen's (1988) standards. This ensures the capability to detect meaningful relationships among variables and to draw valid and reliable conclusions from the data. The core of the statistical analysis involved computing direct, indirect, and total effects among variables using path coefficients. Significance was determined based on p-values (< 0.05). The coefficient of determination (R^2) was also computed to understand the proportion of variance in the dependent variable explained by the model. For mediation testing, the Sobel test and bootstrapped confidence intervals were used. All analyses were conducted using SPSS 26 and AMOS 24. This study adhered to ethical research standards by ensuring voluntary participation, informed consent, confidentiality, and respect for participants' autonomy. Each participant received an informed consent form explaining the study's objectives, their right to withdraw at any time, and the anonymity of their responses. Data were stored securely and used solely for academic purposes. The research protocol was reviewed and approved by the research ethics committee of Universitas Negeri Medan and authorized by the Langsa City Education Office.

RESULTS AND DISCUSSION

The results of this study indicate that principal leadership (X1), school climate (X2), and teacher job satisfaction (X3) have a direct and significant influence on the performance of PJOK teachers (X4) in implementing the Independent Curriculum as in Table 2.

Table 2. Path coefficient values of direct, indirect, total and non-linear influences

Model	Exogenous Variables to Endogenous Variables	Causal Influence			Non-Line		Correlation
		Directly	Indirectly Through X ₃	Total Impact	U	S	
2b	X1 towards X3	0.239	-	-	-	-	0.523
	X2 towards X3	0.407	-	-	-	-	0.574
	X1 towards X4	0.149	0.217	0.655	0.195	-	0.605
	X2 towards X4	0.208	0.238	0.650	0.204	-	0.651
	X3 towards X4	0.416	-	0.710	0.119	0.174	0.711

Note: you = Unanalyzed Components, and S = Fake Components

Substructure Analysis 1: Hypotheses 1 and 2

Leadership influence (X1) to job satisfaction (X3) is shown in the following picture:

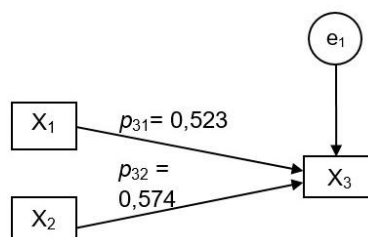


Figure 1. Structure of the causal relationship between X1 and X2 towards X3

In accordance with the above relationship structure, $r_{13} = P_{31} + P_{32} R_{12}$ and $r_{23} = P_{32} + P_{31} R_{12}$. So, the direct effect is relative to X1 ke X3, that is, $r_{13} = P_{31} = 0.523$. Furthermore, using the

proportional effect formula developed by Al-Rasjid, the proportional direct effect is calculated as $P_{31} \times P_{31} = 0.523 \times 0.523 = 0.273$ (rounded). Thus, the leadership of the school principal (X_1), which directly determines changes in teacher job satisfaction (X_3), is $0.273 = 27.3\%$. The relative direct influence of X_2 on X_3 , namely the river $23 = P_{32} = 0.574$, then using the proportional effect formula developed by Al Rasjid, the proportional direct effect is calculated as $P_{32} \times P_{32} = 0.574 \times 0.574 = 0.329$ (rounded). Thus, the school climate (X_2) which directly determines changes in job satisfaction (X_3) is $0.329 = 32.9\%$. The research results show that there is an influence of leadership on job satisfaction in schools. The results of this research partially show that leadership has a direct positive effect on teacher job satisfaction by 27.3%. This means that increasing participative leadership will increase job satisfaction. The research results show that there is an influence of school climate on teacher satisfaction at school. Partial research results show that school climate has a direct positive effect on teacher job satisfaction by 32.9%.

Substructure Analysis 2: Hypotheses 3 and 4

Leadership influence (X_1) against KTeacher Performance in Implementing the Merdeka Curriculum (X_4) is shown in the following figure 2:

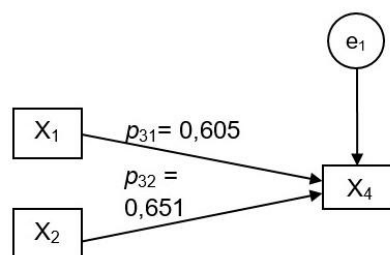


Figure 2. Structure of the causal relationship between X_1 and X_2 towards X_4

In accordance with the above relationship structure, $r_{13} = P_{41} + P_{42} R_{12}$ and $r_{24} = P_{32} + P_{41} R_{12}$. So, the direct effect is relative to X_1 ke X_4 , that is, $r_{14} = P_{31} = 0.605$. Next, using the proportional effect formula developed by Al-Rasjid, the proportional direct effect is calculated as $P_{41} \times P_{41} = 0.605 \times 0.605 = 0.366$ (rounded). Thus, the leadership of the school principal (X_1), which directly determines teacher performance in implementing the Merdeka curriculum (X_4), is $0.366 = 36.6\%$. The relative direct influence of X_2 on X_4 , $P_{24} = P_{42} = 0.651$, then using the proportional effect formula developed by Al Rasjid, the proportional direct effect is calculated as $P_{42} \times P_{42} = 0.651 \times 0.651 = 0.423$ (rounded). Thus, a strong school climate (X_2), which directly determines teacher performance in implementing the Merdeka curriculum (X_4), is $0.423 = 42.3\%$. The research results show that there is an influence of leadership on teacher performance in implementing the Merdeka curriculum in schools. The results of this research partially show that leadership has a direct positive effect on teacher performance in implementing the Merdeka curriculum by 36.6%. This means that the principal's leadership will improve teacher performance in implementing the Merdeka curriculum. The results of the research show that there is an influence of school climate on teacher performance in implementing the Merdeka curriculum in schools. The results of this research partially show that school climate has a direct positive effect on teacher performance to improve teacher performance in implementing the Merdeka curriculum 42.3%.

Substructure Analysis: Hypothesis 5

The Influence of Job Satisfaction (X_3) on teacher performance in implementing the Merdeka curriculum (X_4) is shown in the following figure 3:

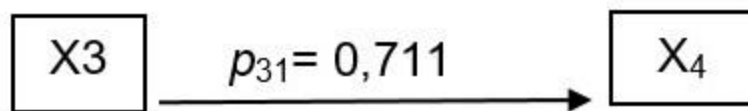


Figure 3. Structure of the causal relationship between X3 towards X4

In accordance with the above relationship structure, $r_{34} = P_{34} + P_{34} R_{34}$. So, the direct influence is relative to X_3 against 4, that is, $r_{34} = P_{34} = 0.711$. Next, using the proportional effect formula developed by Al-Rasjid, the proportional direct effect is calculated as $P_{43} \times P_{43} = 0.711 \times 0.711 = 0.505$ (rounded). So, job satisfaction (X_3), which directly determines changes in teacher performance (X_4), is $0.505 = 50.5\%$. The relative direct influence of X_3 on X_4 , namely the $r_{34} = P_{34} = 0.711$, then using the proportional effect formula developed by Al-Rasjid, the proportional direct effect is calculated as $P_{43} \times P_{43} = 0.711 \times 0.711 = 0.505$ (rounded). Thus, job satisfaction (X_3), which directly determines changes in teacher performance in implementing the Merdeka curriculum (X_4), is $0.505 = 50.5\%$. The results of the research show that there is an influence of teacher job satisfaction on teacher performance in implementing the Merdeka curriculum in schools. The results of this research partially show that job satisfaction has a direct positive effect on teacher performance in implementing the Merdeka curriculum by 50.5%. This means that as job satisfaction increases, teacher performance will improve in implementing the Merdeka curriculum.

Path analysis shows that teacher job satisfaction provides the most dominant contribution to improving teacher performance with a contribution of 50.5%, followed by school climate 42.3%, and principal leadership 36.6%. In more detail, the direct influence of leadership on teacher performance was recorded at 0.149 with an indirect influence through job satisfaction of 0.217, so that the total influence was 0.655. Likewise, school climate has a direct influence of 0.208 and an indirect influence of 0.238, with a total influence of 0.650. Meanwhile, teacher job satisfaction has a direct influence of 0.416 on the performance of PJOK teachers.

The findings of this study are in accordance with the results (Hursepuny et al., 2021), which found that participative leadership gives employees more responsibility for organizational performance and for making planning and organizing decisions (Khalilullah et al., 2024), suggests that leadership has the potential to balance the involvement of managers and subordinates in information processing, which can give teachers influence over organizational decisions, and participative leadership as the creation of an environment that provides more opportunities to acquire resources (Gwiazdowska-Stańczak, 2021; Gazali et al., 2024; Syahrul et al., 2025) leading to higher levels of satisfaction and lower levels of burnout. Increased job satisfaction is expected to result from role expansion and a sense of empowerment brought about by being part of the decision-making process, an expected outcome in individualistic cultures (Iis & Yanita, 2021; Yulianti & Awingan, 2024). Good leadership will be able to increase teacher job satisfaction in schools.

Demonstrating improvements in school climate will have an impact on increasing teacher job satisfaction (Gómez-Zepeda et al., 2017; Hidayat & Patras, 2024). The values, beliefs, hopes and commitment to quality are reflected in an individual who carries out their duties, so that, whether they realize it or not, they show teacher job satisfaction, at least in the form of satisfaction when the product or service produced reaches a quality that meets predetermined standards (Harrison et al., 2023; Istiqomah et al., 2025). Interactions between students, teachers and staff during the educational process must create a strong school climate (Muchlis et al., 2025). Therefore, schools must focus on teacher job satisfaction by strengthening value-oriented aspects, norms, attitudes, beliefs, morals, innovative awareness, competitive awareness, and professional traditions.

These results indicate that the quality of school principal leadership contributes significantly to the creation of a conducive work climate and promotes a higher level of teacher job satisfaction, which ultimately enhances the performance quality of teachers in implementing the Merdeka Curriculum. This interpretation is consistent with the previous study by (Sliwka et al., 2024), which demonstrated that participative leadership styles strengthen employee commitment and performance. Moreover, this finding reinforces the results of (Simaremare et al., 2023), who found that a supportive school climate positively influences teacher performance.

Furthermore, the results are aligned with the organizational behavior model proposed by (do Nascimento et al., 2023), which explains that job satisfaction mediates the relationship between

leadership and organizational commitment. This implies that improving teacher performance does not rely on a single aspect, but rather on a combination of structural and psychological factors that reinforce each other. This study confirms that teachers who feel valued, morally supported, and given opportunities for professional growth are more likely to demonstrate optimal performance. The practical implication of these findings is the urgency to enhance the transformational leadership capacity of school principals. Principals must be able to foster a working environment that supports collaboration, open communication, and professional trust. Likewise, the establishment of a positive school climate should be prioritized to strengthen teachers' work motivation and professional satisfaction, especially in the subject of physical education, which has often been overlooked in curriculum reform efforts.

In terms of novelty, this research highlights the importance of school organizational dimensions—such as climate and job satisfaction—as key determinants of PE teacher performance within the context of the Merdeka Curriculum. While many previous studies have focused primarily on academic subject teachers, this study offers a unique contribution by placing PE teachers at the center of attention, thus providing a new perspective for policymaking in enhancing the quality of physical education in Indonesia. However, the limitation of this study lies in its relatively small and localized sample (limited to Langsa City), so the generalization of results to other regions or educational levels should be approached cautiously. Therefore, future research is recommended to use a broader regional scope, a longitudinal approach, and the integration of qualitative data to explore psychosocial dimensions more deeply.

Overall, this study concludes that improving the performance of PE teachers in implementing the Merdeka Curriculum cannot be achieved solely through technical training. It must be supported by strong principal leadership, a healthy work climate, and a high level of teacher job satisfaction as foundational elements for fostering meaningful and transformative learning experiences.

CONCLUSION

This study concludes that the performance of physical education (PE) teachers in implementing the Merdeka Curriculum is significantly influenced by three key variables: principal leadership, school climate, and teacher job satisfaction. Among these, job satisfaction emerges as the most dominant predictor of teacher performance, reinforcing the notion that psychological and emotional factors are critical to effective curriculum implementation. Principal leadership and school climate also play crucial roles in shaping a professional environment that supports teacher motivation, engagement, and instructional effectiveness. The findings affirm that a transformative school leadership approach, a collegial and supportive school climate, and high levels of job satisfaction must coexist to optimize teacher performance. This interrelationship contributes to a deeper understanding of how organizational and psychological dynamics impact educational reform outcomes. The implication is clear: professional development strategies must not only focus on content mastery but also emphasize leadership development, organizational culture enhancement, and teacher well-being. Moreover, the study proposes a conceptual reinforcement: job satisfaction acts as a psychological bridge linking organizational structures (leadership and climate) to performance outcomes. This concept may serve as the foundation for future empirical frameworks in educational leadership and teacher development, particularly in non-academic subject areas like physical education. Accordingly, policymakers and school leaders must integrate structural and affective strategies to build sustainable reform capacity, especially in subjects often marginalized in curriculum innovation.

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AUTHOR CONTRIBUTIONS

Suryadi Damanik served as the lead author and was primarily responsible for formulating the research problem, developing the conceptual framework, and designing the research methodology. He

led the overall coordination of the research process and took the primary role in drafting and revising the manuscript, especially in the Introduction and Conclusion sections. Mesnan contributed significantly to the theoretical construction of the study and was actively involved in the development and validation of the research instruments. He also supported the literature review by identifying key studies and ensuring theoretical alignment with the research objectives. Additionally, he participated in structuring the discussion to ensure the alignment of findings with relevant educational theories. Yuniarto Mudjisusatyo was in charge of processing the research data, conducting statistical analyses using path analysis techniques, and interpreting the analytical results. He contributed to the preparation of the Results section, including the development of relevant tables, graphs, and analytical narratives, and provided critical feedback on data accuracy. Saipul Ambri Damanik played a key role in managing the field implementation of the research, including coordinating with schools, facilitating the distribution and collection of questionnaires, and ensuring ethical compliance throughout the data collection process. He also assisted in analyzing findings related specifically to the role of physical education teachers in curriculum implementation. Syarifah Puspita assisted with data entry, instrument validation, and verification of raw data quality. She contributed meaningfully to the practical aspects of data organization and ensured that responses were recorded accurately. In addition, she provided insights based on her teaching experience to enrich the interpretation of field findings from a practitioner's perspective. All authors jointly discussed the research implications and contributed to finalizing the manuscript. Each author has read and approved the final version of the paper and agreed to be accountable for all aspects of the work.

CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

REFERENCES

- Anugradia, N., Kruehong, T., & Alvarez, J. L. (2025). Students' evaluation of the effectiveness of open access journals in accelerating paper completion. *Journal of Educational Technology and Learning Creativity*, 3(1), 122-130. <https://doi.org/10.37251/jetlc.v3i1.1462>.
- Aygün, M. (2021). Analysis of the relationship between job satisfaction and organizational trust of physical education and sports teachers. *Journal of Pedagogical Research*, 5(1), 203–215. <https://doi.org/10.33902/JPR.2021167583>.
- Balga, T., & Antala, B. (2022). Job Satisfaction of Physical Education Teachers in Slovakia. *Sport Mont*, 20(2), 89–94. <https://doi.org/10.26773/smj.220614>.
- Basalamah, M. S. A., & As'ad, A. (2021). The Role of Work Motivation and Work Environment in Improving Job Satisfaction. *Golden Ratio of Human Resource Management*, 1(2), 94–103. <https://doi.org/10.52970/grhrm.v1i2.54>.
- Berkovich, I., & Eyal, O. (2017). The mediating role of principals' transformational leadership behaviors in promoting teachers' emotional wellness at work: A study in Israeli primary schools. *Educational Management Administration and Leadership*, 45(2), 316–335. <https://doi.org/10.1177/1741143215617947>.
- Bessa, C., Hastie, P., Rosado, A., & Mesquita, I. (2021). Sport education and traditional teaching: Influence on students' empowerment and self-confidence in high school physical education classes. *Sustainability (Switzerland)*, 13(2), 1–14. <https://doi.org/10.3390/su13020578>.
- Böke, H., & NORMAN, G. (2022). the Relationship Between Job Satisfaction and Professional Burnout: a Systematic. *International Journal of Eurasian Education and Culture*, 7(16), 301–334. <https://doi.org/10.35826/ijoecc.445>.
- Bush, T. (2018). Transformational leadership: Exploring common conceptions. *Educational Management Administration and Leadership*, 46(6), 883–887. <https://doi.org/10.1177/1741143218795731>.
- Claassen, K., & Broding, H. C. (2019). Mental strain of immigrants in the working context.

- International Journal of Environmental Research and Public Health*, 16(16), 1–9. <https://doi.org/10.3390/ijerph16162875>.
- do Nascimento, R. K., Martins, A. C., Guimarães, J. R. S., Tavares, G. H., Both, J., & Folle, A. (2023). Job satisfaction and quality of life of teachers of Physical Education in Grande Florianópolis. *Revista Brasileira de Ciências Do Esporte*, 45. <https://doi.org/10.1590/rbce.45.e20230012>.
- Doğan, P. K., Yakup Akyel, & İsa Doğan. (2018). Examination of the Relationship Between Job Satisfaction and Job Stress of Physical Education Teachers. *Acta Didactica Napocensia*, 11(1), 1–12. <https://doi.org/10.24193/adn.11.1.1>.
- Eirín-Nemiña, R., Sanmiguel-Rodríguez, A., & Rodríguez-Rodríguez, J. (2022). Professional satisfaction of physical education teachers. *Sport, Education and Society*, 27(1), 85–98. <https://doi.org/10.1080/13573322.2020.1816540>.
- Gazali, N., Saad, N., Setiawan, E., & Lobo, J. (2024). Job satisfaction among physical education teachers: A systematic literature review. *Edu Sportivo: Indonesian Journal of Physical Education*, 5(1), 94–109. [https://doi.org/10.25299/esijope.2024.vol5\(1\).16320](https://doi.org/10.25299/esijope.2024.vol5(1).16320).
- Gómez-Zepeda, G., Petreñas, C., Sabando, D., & Puigdemívol, I. (2017). The role of the Support and Attention to Diversity Teacher (SADT) from a community-based perspective: Promoting educational success and educational inclusion for all. *Teaching and Teacher Education*, 64(4), 127–138. <https://doi.org/10.1016/j.tate.2017.02.002>.
- Gwiazdowska-Stańczak, S. (2021). School engagement and school climate of students with high and low grade point averages. *Kwartalnik Naukowy Fides et Ratio*, 48(4), 427–439. <https://doi.org/10.34766/fetr.v48i4.974>.
- Harrison, M. G., King, R. B., & Wang, H. (2023). Satisfied teachers are good teachers: The association between teacher job satisfaction and instructional quality. *British Educational Research Journal*, 49(3), 476–498. <https://doi.org/10.1002/berj.3851>.
- Hidayat, R., & Patras, Y. E. (2024). Teacher innovativeness: The effect of self-efficacy, transformational leadership, and school climate. *Journal of Pedagogical Research*, 8(1), 208–222. <https://doi.org/10.33902/JPR.202424547>.
- Hunaepi, H., & Suharta, I. G. P. (2024). Transforming education in Indonesia: The impact and challenges of the merdeka belajar curriculum. *Path of Science*, 10(6), 5026–5039. <https://doi.org/10.22178/pos.105-31>.
- Hursepuny, J., Dewi, S., Rizki, T., & Listyowati, D. (2021). Pengaruh gaya kepemimpinan dan disiplin kerja terhadap kinerja karyawan pada PT Trans Retail Indonesia [The influence of leadership style and work discipline on employee performance at PT Trans Retail Indonesia]. *Journal of Information System, Applied, Management, Accounting and Research*, 5(4), 858–867. <https://doi.org/10.52362/jisamar.v5i4.516>.
- Ikhsan, M., Atun, S., Agusta, F., Unayah, H., Buhera, R., Pamungkas, O., Sarip, M., & Sitorus, P. A. (2025). Development of critical thinking essay test instrument and prosocial intention questionnaire for environmental care in students. *Journal Evaluation in Education (JEE)*, 6(1), 66-78. <https://doi.org/10.37251/jee.v6i1.1273>.
- Iis, E. Y., & Yanita. (2021). Peran Motivasi Kerja Dan Kepuasan Kerja Dalam Memediasi Pengaruh Budaya Organisasi Terhadap Kinerja Karyawan Pada Pt Bank Aceh Syariah Cabang Bireuen. *E-Mabis: Jurnal Ekonomi Manajemen Dan Bisnis*, 22(1), 85–96. <https://doi.org/10.29103/e-mabis.v22i1.671>.
- Istiqomah, I., Karnati, N., & Rugaiyah, R. (2025). The effect of distributed leadership, school climate, and work motivation on teacher's job satisfaction at senior high school. *Journal of Posthumanism*, 5(4), 1331–1343. <https://doi.org/https://doi.org/10.63332/joph.v5i4.1248>.
- Jarnawi, M., Haeruddin, H., Werdhiana, I. K., Syamsuriwal, S., & Mu'aziyah, S. E. S. (2025). Integrating thinking styles into differentiated instruction: Enhancing learning outcomes in science education. *Integrated Science Education Journal*, 6(1), 47-53. <https://doi.org/10.37251/isej.v6i1.1328>.
- Jalmasco, A. C., Loberes, J. M., & Lasala, N. J. (2025). Interactive story for teaching ecosystem topics using twine application for elementary school students. *Journal of Basic Education Research*, 6(2), 66-78. <https://doi.org/10.37251/jber.v6i2.1480>.
- Jumaera, S., Blessing, O. T., & Rukondo, N. (2024). Optimizing student activities and learning outcomes through problem solving models in stoichiometry material. *Journal of Chemical Learning Innovation*, 1(2), 39-44. <https://doi.org/10.37251/jocli.v1i2.1147>.

- Khalilullah, M., Vebrianto, R., Syukri, M., Mujtahid, I. M., & Hardila, D. (2024). Islamic understanding in the digital age among university student associations. *Millati: Journal of Islamic Studies and Humanities*, 8(2), 191–215. <https://doi.org/10.18326/millati.v8i2.543>.
- Kheang, S., Hankhantod, P., & Wesonga, L. N. (2025). Design and experimental study of a biomass pellet gasifier stove with heat recovery system for high efficiency and low emission. *Journal of Educational Technology and Learning Creativity*, 3(1), 39–46. <https://doi.org/10.37251/jetlc.v3i1.1620>.
- Laila, S. N. F., Mufarokah, A., Anwar, H. S., & Mudhofar, A. (2025). Curriculum changes in Indonesia ; Implementation and its challenges in religious institutions. *Journal of Educational Research and Practice*, 3(1), 1–16. <https://doi.org/10.70376/jerp.Received>.
- Lutfi Altahayneh, Z., Khasawneh, A., & Abedalhafiz, A. (2014). Relationship between organizational justice and job satisfaction as perceived by Jordanian physical education teachers. *Asian Social Science*, 10(4), 131–138. <https://doi.org/10.5539/ass.v10n4p131>.
- Marini, N. K., Dantes, K. R., & Werang, B. R. (2024). Kontribusi pola asuh orang tua, teman sebaya, iklim sekolah, dan minat belajar terhadap hasil belajar PPKn siswa kelas XI SMK Negeri 1 Denpasar [The contribution of parenting patterns, peers, school climate, and learning interest to the learning outcomes of PPKn of class XI students at SMK Negeri 1 Denpasar]. *EDUKASIA: Jurnal Pendidikan Dan Pembelajaran*, 5(1), 55–64. <https://doi.org/10.62775/edukasia.v5i1.716>.
- Morris, J. E., Lummis, G. W., Lock, G., Ferguson, C., Hill, S., & Nykiel, A. (2020). The role of leadership in establishing a positive staff culture in a secondary school. *Educational Management Administration and Leadership*, 48(5), 802–820. <https://doi.org/10.1177/1741143219864937>.
- Mouloud, K., Bougherra, B., & Samir, B. F. (2016). Job satisfaction for physical education teachers and its relationship to job. *Pedagogics Psychology Medical-Biological Problems of Physical Training and Sports*, 20(3), 47–51. <https://doi.org/10.15561/18189172.2016.0307>.
- Muchlis, F., Elwamendri, Sardi, I., Fathoni, Z., & Jamil, A. S. (2025). Sustainable livelihoods for suku anak dalam: Integrating local wisdom and natural resources. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 9(1), 238–252. <https://doi.org/10.22437/jiituj.v9i1.36515>.
- Mudjisusaty, Y., Darwin, D., & Kisno, K. (2024). The use ADDIE model to improve the competence of the higher education task force in obtaining competitive funding for the independent campus program. *Journal of Applied Research in Higher Education*. <https://doi.org/10.1108/JARHE-12-2023-0580>.
- Muspawi, M., Sofwan, M., Yantoro, Mulyadi, & Septiana, R. R. (2025). The influence of work environment and organizational culture on teacher job satisfaction in supporting economic development in the education sector. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 9(2), 562–576. <https://doi.org/10.22437/jiituj.v9i2.37378>.
- Nascimento, R. K. do, Folle, A., Rosa, A. I. da, & Both, J. (2016). Job satisfaction among physical education teachers from the municipal network of São José-Sc. *Journal of Physical Education (Maringa)*, 27(1), 1–11. <https://doi.org/10.4025/jphyseduc.v27i1.2740>.
- Nou, H., Mok, S., Lim, S., & Em, S. (2025). The relationship between students' attitudes towards cooperative learning strategies and their academic achievement. *Journal of Social Knowledge Education (JSKE)*, 6(2), 200–210. <https://doi.org/10.37251/jske.v6i2.1606>.
- Obenza, B. N., Galido, J. C. A., Madridano, T. J. M., Mocallay, K. B. V., Quio, K., Rojo, E. M. H., & Sedot, J. C. (2025). Analyzing university students' attitude and behavior towards jesi program using technology acceptance model. *Indonesian Journal of Education Research (IJoER)*, 6(2), 177–186. <https://doi.org/10.37251/ijoer.v6i2.1402>.
- Putri, E. N., Mahdavi, M., & Awlqadir, M. S. (2025). An analysis of students' motivation and their achievement in learning english at the department of english education. *Journal of Language, Literature, and Educational Research*, 2(1), 43–50. <https://doi.org/10.37251/jolle.v2i1.1698>.
- Prasetijo, P., & Samidjo, S. (2019). Peran kepemimpinan kepala sekolah dalam meningkatkan mutu sekolah [The role of principal leadership in improving school quality]. *Jurnal Kebijakan Dan Pengembangan Pendidikan (JKPP)*, 1(1), 1–5. <http://jurnal.ustjogja.ac.id/index.php/jkpp>.
- Rachmatika, S. V., & Salighehdar, N. (2024). The influence of health education via whatsapp media on the level of knowledge of adolescents about gastritis. *Journal of Health Innovation and Environmental Education*, 1(2), 32–37. <https://doi.org/10.37251/jhiee.v1i2.1204>.
- Rahmah, A., Kristiawan, M., & Destiniar, D. (2021). The influence of principal leadership and

- organizational climate on teacher performance. *JPGI (Jurnal Penelitian Guru Indonesia)*, 6(1), 229. <https://doi.org/10.29210/021045jpgi0005>.
- Ridwan, A., Hendra, R., Guillén-Gámez, F. D., Fauzan, M., Alqahtani, T. M., Yaqin, L. N., & Setambah, M. A. B. (2024). Instructional leadership and teacher self-efficacy on job satisfaction: The mediating effect of school climate in Indonesian Islamic senior high schools. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 8(2), 732–745. <https://doi.org/10.22437/jiituj.v8i2.37023>.
- Rubio, M. T., Mensah, J., & Sokpe, B. (2025). Trends in international mathematics and science study (TIMSS): A comparative analysis of mathematics achievement. *Interval: Indonesian Journal of Mathematical Education*, 3(1), 109–115. <https://doi.org/10.37251/ijome.v3i1.1733>.
- Salamah, U., Masripah, & Nugraha, A. T. (2023). Pengaruh Iklim Organisasi Madrasah terhadap Motivasi Kerja Untuk Mewujudkan Kinerja Guru. *Khazanah Akademia*, 7(01), 45–59. <https://doi.org/10.52434/jurnalkhazanahakademia.v7i01.144>.
- Salim, M. A., Rajabiyah, N., & Misrodin, M. (2025). Exploring the role of emotional intelligence and self-confidence in supporting Islamic religious education learning outcomes. *Jurnal Pendidikan Agama Islam Indonesia (JPAIL)*, 6(1), 1–10. <https://doi.org/10.37251/jpaii.v6i1.1431>.
- Siddique, Z. F., Nahar, L., & Mahmood, F. (2025). Autoethnographic projection of climate change education through project-based learning: Perspectives from early career scholars. *Integrated Science Education Journal*, 6(1), 38–46. <https://doi.org/10.37251/isej.v6i1.1170>.
- Silitonga, N., Novitasari, D., Sutardi, D., Sopa, A., Asbari, M., & Yulia, Y. (2020). The relationship of transformational leadership, organizational justice and organizational commitment: A mediation effect of job satisfaction. *Journal Of Critical Reviews*, 7(19), 89–108.
- Simaremare, A., Rahman, A., Meftah, M., Baharuddin, B., & Ampera, D. (2023). The Existence of Teacher Leadership and School Climate Impact on Teacher Performance To cite this article : The Existence of Teacher Leadership and School Climate Impact on Teacher Performance. *International Journal of Education in Mathematics, Science and Technology*, 11(6), 1518–1536. <https://doi.org/https://doi.org/10.46328/ijemst.3819>.
- Sliwka, A., Klopsch, B., Beigel, J., & Tung, L. (2024). Transformational leadership for deeper learning: shaping innovative school practices for enhanced learning. *Journal of Educational Administration*, 62(1), 103–121. <https://doi.org/10.1108/JEA-03-2023-0049>.
- Somantri, Y. N. (2024). Analysis of the physical education learning process through online media. *Multidisciplinary Journal of Tourism, Hospitality, Sport and Physical Education*, 1(1), 11–15. <https://doi.org/10.37251/jthpe.v1i1.1037>.
- Syahrul, A. R., Suryana, S., Hendrayati, H., & Furqon, C. (2025). The dynamics of entrepreneurship education in higher education: The role of family background and environment in developing entrepreneurial skills. *Journal Evaluation in Education (JEE)*, 6(2), 590–600. <https://doi.org/10.37251/jee.v6i2.1540>.
- Theresa, D., Marsh, H. W., Parker, P. D., Guo, J., Riley, P., & Waldeyer, J. (2019). Job Satisfaction of Teachers and their Principals in Relation to Climate and Student Achievement. *Journal of Educational Psychology*, 112(5), 1–38. <https://doi.org/https://doi.org/10.1037/edu0000409>.
- Yan, T., Teo, E. W., Lim, B. H., & Lin, B. (2022). Evaluation of competency and job satisfaction by positive human psychology among physical education teachers at the university level: A systematic review. *Frontiers in Psychology*, 13(December), 1–9. <https://doi.org/10.3389/fpsyg.2022.1084961>.
- Yulianti, S., & Awingan, J. S. (2024). The relationship between assertive behavior and academic achievement of biology education students: The contribution of assertive behavior in improving academic outcomes. *Journal of Academic Biology and Biology Education*, 1(2), 46 - 55. <https://doi.org/10.37251/jouabe.v1i2.1167>.
- Zhengkang, F., & Yaakob, M. F. M. (2025). The Mediating Role of Organizational Learning in the Relationship Between Leadership Communication, Knowledge Management, and Organizational Commitment Among Academician. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 9(1), 15–35. <https://doi.org/10.22437/jiituj.v9i1.37224>.